U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Office of the Assistant Secretary for Planning and Evaluation

Report to Congress:

Social Risk Factors and Performance Under Medicare's Value-Based Purchasing Programs

A Report Required by the Improving Medicare Post-Acute Care Transformation (IMPACT) Act of 2014

United States Department of Health and Human Services

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Executive Summary

I. Background

There is growing recognition that social risk factors – such as income, education, race and ethnicity, employment, community resources, and social support – play a major role in health.[1-3] Despite ongoing efforts, significant gaps remain in health and in life expectancy based on income, race, ethnicity, and community environment.[4-7]

At the same time, the health care system is increasingly moving towards higher levels of provider accountability for the quality, outcomes, and costs of care. Value-based or alternative payment models, which tie payment to the quality and efficiency of health care delivered, are in place in nearly all Medicare settings, including in hospitals, outpatient settings, and post-acute facilities.

These two issues are intersecting. If beneficiaries with social risk factors have worse health outcomes because the providers they see provide low-quality care, value-based purchasing could be a powerful tool to drive improvements in care and reduce health disparities. However, if beneficiaries with social risk factors have worse health outcomes because of elements beyond the quality of care provided, such as the social risk factors themselves, value-based payment models could do just the opposite. If providers have limited ability to influence health outcomes for beneficiaries with social risk factors, they may become reluctant to care for beneficiaries with social risk factors, out of fear of incurring penalties due to factors they have limited ability to influence.

In many ways, beneficiaries with social risk factors may benefit the most from value-based purchasing programs and other delivery system reform efforts, since improved care coordination and provider cooperation will be of the highest utility to the most complex beneficiaries with the most care needs. Therefore, in order to properly align payments and ensure value-based purchasing programs achieve their intended goals, the relationships between social risk and performance on these programs need to be better understood. This report, mandated by the Improving Medicare Post-Acute Care Transformation Act of 2014 or the IMPACT Act (P.L. 113-185),[8] shares empirical analysis using existing Medicare data to help address these questions and provides considerations for policymakers while additional work using other data sources continues.

II. Definitions and Scope

The social risk factors examined in this report were dual enrollment in Medicare and Medicaid as a marker for low income, residence in a low-income area, Black race, Hispanic ethnicity, and residence in a rural area. Disability was also examined as it is related to many social risk factors, available in claims data, and already used in some Medicare payment calculations. Note that there are many other social risk factors that were not examined in this report due to data limitations; many of these will be addressed in Study B, also mandated under the IMPACT Act. Providers (here, hospitals, health plans,

physicians, dialysis facilities, skilled nursing facilities, and home health agencies) in the top quintile of the proportion of their beneficiaries with each social risk factor (for example, the physicians with the highest proportion of dually-enrolled beneficiaries) were considered "safety-net" providers for the purposes of this Report.

Medicare payment programs were selected for analysis if they were currently operational or defined in statute, and if they incorporated quality and/or efficiency metrics into payment (Table 1):

Table 1: Medicare Payment Programs Included in this report

Program
1) Hospital Readmissions Reduction Program
2) Hospital Value-Based Purchasing Program
3) Hospital Acquired Condition Reduction Program
4) Medicare Advantage (Part C) Quality Star Rating Program*
5) Medicare Shared Savings Program
6) Physician Value-based payment modifier Program†
7) End-Stage Renal Disease Quality Incentive Program
8) Skilled Nursing Facility Value-Based Purchasing Program‡
9) Home Health Value-Based Purchasing Program‡
*Includes Part D metrics where applicable. †Note that these program sunsets, and is replaced by the Merit-Based Incentive Payment System (MIPS) in 2019. ‡The SNF VBP and HHVBP programs are too new to have program-level data yet available for analysis; thus for the purpose of this report only certain measures that may be used in these two programs were analyzed.

III. Findings

A. FINDING 1: Beneficiaries with social risk factors had worse outcomes on many quality measures, regardless of the providers they saw, and dual enrollment status was the most powerful predictor of poor outcomes.

Beneficiaries with social risk factors had poorer outcomes on many quality measures, including process measures (e.g., cancer screening), clinical outcome measures (e.g., diabetes control, readmissions), safety (e.g., infection rates), and patient experience measures (e.g., communication from doctors and nurses), as well as higher resource use (e.g., higher spending per hospital admission episode). This was true even when comparing beneficiaries at the same hospital, health plan, ACO, physician group, or facility. Dual enrollment (enrollment in both Medicare and Medicaid) was typically the most powerful predictor of poor performance among those social risk factors examined. For the most part, these findings persisted after risk adjustment, across care settings, measure types, and programs, and were moderate in size.

B. FINDING 2: Providers that disproportionately served beneficiaries with social risk factors tended to have worse performance on quality measures, even after accounting for their beneficiary mix. Under all five value-based purchasing programs in which penalties are currently assessed, these

providers experienced somewhat higher penalties than did providers serving fewer beneficiaries with social risk factors.

In every care setting examined, providers that disproportionately cared for beneficiaries with social risk factors tended to perform worse than their peers on quality measures. Some of these differences were driven by beneficiary mix, but some of the difference persisted even after adjusting for beneficiary characteristics. As a result, safety-net providers were more likely to face financial penalties across all five operational Medicare value-based purchasing programs in which penalties are assessed, including programs in the hospital, physician group, and dialysis facility settings. They were also less likely to receive bonuses in Medicare Advantage. The single exception was that ACOs with a high proportion of dually-enrolled beneficiaries were more likely to share in savings under the Medicare Shared Savings Program, despite slightly worse quality scores.

However, in every setting, be it hospital, health plan, ACO, physician group, or facility, there were some providers that served a high proportion of beneficiaries with social risk factors who achieved high levels of performance. This suggests that high performance is feasible, with the right strategies and supports.

C. Interpretation of Findings

The first question motivating this research was "Do beneficiaries with social risk factors have worse outcomes due to their social risk profile, or because of the providers they see?" The answer is *both* – dual enrollment status is independently associated with worse outcomes, and dually enrolled beneficiaries are more likely to see lower-quality providers. The second question was "Do providers that serve beneficiaries with social risk factors perform worse due to the high proportion of beneficiaries with social risk factors, or do they provide lower-quality care overall?" The answer, again, is *both*. Providers serving high proportions of beneficiaries with social risk factors tended to perform worse in part due to the patient population, and in part due to poor performance overall.

However, these analyses cannot determine why such patterns exist. Beneficiaries with social risk factors may have poorer outcomes due to a host of factors, including higher levels of medical risk, worse living environments, greater challenges in adherence and lifestyle, and/or bias or discrimination.

Some of these factors are beyond providers' control, such as higher levels of medical risk and worse living environments. Some of these factors are probably under some influence from clinicians, such as adherence and lifestyle choices. And some of these factors are entirely under clinicians' control, including bias and discrimination.

Providers serving these beneficiaries may have poorer performance due to a similarly long list of factors, including fewer resources, more challenging clinical workloads, lower levels of community support, or worse quality of care. Again, some of these factors are under providers' control, and some are not.

Many of these factors, for both beneficiaries and providers, are not easily measured with current data. Yet understanding the "whys" is essential to finding lasting and meaningful solutions. There is clearly a need for more research in this area.

D. Potential Solutions

A number of potential solutions for if and how to account for social risk in Medicare programs have been proposed. It is important to note that quality measures are used in two ways for these programs: 1) reporting to providers and the public; and 2) to determine payment adjustments such as bonuses and penalties. Thus, potential solutions can be relevant to adjusting the measures for reporting, adjusting the measures for the purpose of determining payments, or directly adjusting the payment methodologies without adjusting the measures themselves.

i. Adjusting quality and resource use measures

Quality and resource use measures can be and are used for multiple purposes. Some measures are used purely for quality improvement, typically within a health care system or clinical practice to identify and track specific clinical areas for improvement. Many of these measures are processes of care that are based upon steps within clinical practice guidelines, such as whether or not a Hemoglobin A1C was ordered for diabetic patients. Generally, measures used for this purpose are not risk adjusted at all, even for clinical co-morbidities, as providers are most interested in using these measures to track performance within their organization, and not for comparative performance purposes.

Most measures used within the Medicare programs are used for public reporting and accountability, or value-based purchasing, although they may also be valuable for providers to track for quality improvement as well. These measures are typically used to profile providers against one another, usually as a requirement of the statute authorizing the quality or value-based purchasing program. In order to "level the playing field," these quality and resource use measures may be adjusted for a variety of risk factors, most commonly age and clinical co-morbidities. The goal of risk adjustment is to fairly compare providers to one another on patient outcomes, such that the main differences in performance are related to the quality of care provided, rather than to patient factors over which providers have no control, such as clinical conditions. It is measures used for public reporting and payment that are the focus of this report.

Public reporting of quality measures serves important informational purposes. For one, it allows beneficiaries to make informed choices of their providers and health plans. Second, it provides useful information to providers and plans as they monitor their performance and implement programs to improve quality. Finally, it provides Medicare and other purchasers with information to monitor programs and guide value-based purchasing decisions. Whether these measures should be adjusted for social risk factors prior to reporting has been the subject of debate.

Some have argued that measures used for public reporting and accountability should be adjusted for social risk factors, in order to "level the playing field." Advocates of this approach argue that adjusting measures for social risk factors recognizes the greater challenges that may be faced in achieving high performance for beneficiaries with social risk factors, and may reduce the likelihood that concerns about performance could lead to worse access to care for these groups by penalizing providers who serve them. They also argue that failing to adjust for differences in the populations served by different providers may lead to inaccurate representations of the quality of care a provider is furnishing to

patients. Advocates of this view argue that, without adjustment, some of the differences in reported performance reflect differences in the populations providers serve, rather than the performance of the providers themselves.

Supporters of adjusting measures for social risk factors note that there may be situations in which measure performance is so closely tied to social risk and its consequences, in ways that are truly beyond providers' control, that achieving policy goals necessitates adjustment. For example, there is significant evidence that dually-enrolled beneficiaries, on average, are more medically complex and have higher healthcare needs. Therefore, poor performance on measures of care utilization may reflect patient need or complexity rather than poor quality of care, and failing to adjust may penalize providers for providing additional needed services to these groups. Currently, some care utilization measures, as well as the self-reported health status measures used in the Medicare Advantage program and the patient experience measures used in many current Medicare payment programs, are adjusted for social risk.

Others, however, have argued that adjustment for social risk is not appropriate. First, they argue that adjusting measures for social factors risks masking disparities in the quality of care provided, thereby significantly reducing the long-term ability to identify and reduce them. Second, at least to the degree that differences in quality are related to poor performance, bias, or discrimination, they argue that directly adjusting measures could excuse the delivery of worse care to beneficiaries with social risk factors. Third, opponents of adjusting for social risk suggest that doing so may reduce incentives for providers to participate in alternative care delivery models, and therefore providers may miss opportunities to provide better-coordinated and tailored care to vulnerable beneficiaries. Finally, they argue that adjusting the measures may have a negative impact on transparency for consumers and others.

Opponents of adjusting measures also argue that broad adjustment is inappropriate because there are many quality measures for which there is no plausible role for adjustment – pure process measures such as giving aspirin for a heart attack, for example, should generally not be adjusted for social risk since they are entirely under providers' control, and should be done regardless of a beneficiary's social risk profile. Under this theory, there is no reason that social risk should be directly associated with performance on process measures, and poor performance in these scenarios is more likely reflective of poor quality than of need or complexity. Currently, the majority of process and clinical outcome measures used in Medicare payment programs are not adjusted for social risk.

ii. Adjusting payments

Whether a decision is made to adjust the measures themselves for reporting purposes, a separate decision is possible with regard to adjusting payment (penalties and bonuses) for social risk. One option is to base the penalty/bonus calculation on adjusted measures; this has some of the pros and cons above, though does not negatively impact transparency since the adjustment is applied after reporting.

However, another option for accounting for social risk in Medicare's value-based purchasing programs lies in not adjusting the measures themselves, but instead in altering the mechanism by which performance is translated to payment. Such alterations could be used to give additional "credit" to

providers that serve a high proportion of beneficiaries with social risk factors. If these payment adjustments were linked to improvement or achievement in performance for beneficiaries with social risk factors, they could potentially provide additional incentives to improve care and outcomes for these groups, and provide financial support while preserving accountability.

Such an approach preserves the transparency of the measures, but still recognizes the challenges inherent in achieving high quality and good outcomes for beneficiaries with social risk factors. It might also offset concerns that, in the absence of some type of accounting for social risk, value-based purchasing models could result in providers becoming reluctant to care for beneficiaries with social risk factors out of fear of incurring penalties due to elements they have limited ability to influence.

iii. Addressing the Underlying Issues

Finally, some point out that neither adjusting the measures, nor altering value-based payments, addresses the fundamental problems underlying the pervasive differences in performance across measures and programs. Social determinants of health are powerful, and to make things better for beneficiaries with social risk factors and the providers who serve them, these factors need to be explicitly measured and their impact tracked, perhaps via the use of new measures that specifically capture providers' performance for beneficiaries with social risk factors. Such new measures could include calculating performance on current measures for subgroups of beneficiaries with social risk factors, or specific measures of health equity comparing performance between beneficiaries with social risk factors and other beneficiaries.

Once measured and recognized, these issues could be addressed with financial and technical assistance. Such assistance should be tailored to recognize the unique characteristics of beneficiaries with social risk factors and the providers that disproportionately serve them, and directed toward the goal of achieving highest quality of care for all patients.

IV. Strategies and Considerations

The Department's goal is to develop value-based payment programs under which *all* Medicare beneficiaries receive the highest quality healthcare services. In the context of the findings above, however, it is clear that doing so will require a multipronged approach, as proposed solutions that address only the measures without considering the broader delivery system and policy context are unlikely to mitigate the full implications of the relationship between social risk factors and outcomes. Ideally, value-based purchasing programs can be leveraged to enhance, rather than threaten, access to and provision of high-quality care for beneficiaries with social risk factors.

Therefore, the Department proposes for consideration a three-part strategy (Figure 1):

Figure 1. Strategy for Accounting for Social Risk in Medicare's Value-Based Purchasing Programs

First, performance on quality and outcomes should be **measured and reported specifically for beneficiaries with social risk factors**. Doing so would allow policymakers and clinical leaders to identify, track, and address disparities in care.

Second, **high, fair quality standards** should be set for all beneficiaries. Whether the most "fair" standard is one that does or does not adjust for social risk will depend on the type of measure and how the considerations outlined earlier apply to that particular measure. Additionally, all measures should be studied to determine whether accounting for frailty, medical complexity, functional status, or other factors might improve their ability to fairly and accurately assess provider performance.

Meeting quality standards, particularly for outcome measures, may be harder for beneficiaries with social risk factors, who face specific challenges to achieving good health outcomes. Therefore, value-based purchasing programs should:

a) provide **specific payment adjustments to reward achievement and/or improvement for beneficiaries with social risk factors,** and

b) where feasible, **provide targeted support** for providers who disproportionately serve them.

First, leveraging the power of value-based purchasing to provide specific payment adjustments to reward providers for successfully achieving high quality and/or good health outcomes in beneficiaries with social risk factors may provide important incentives to focus on these individuals, and help offset any real or perceived disincentives to caring for them.

Second, providing targeted support, for example through quality improvement programs designed specifically for beneficiaries with social risk factors, is also critical to ensuring that all beneficiaries can have the best health outcomes possible. Another key component of support is ensuring that current base payments are adequate to support high-quality care for beneficiaries with social risk factors.

Considerations for how these strategies might be applied to Medicare payment programs are provided below. Note that these are general considerations, and not all apply to each program reviewed.

A. STRATEGY 1: Measure and Report Quality for Beneficiaries with Social Risk Factors

Consideration 1: Consider enhancing data collection and developing statistical techniques to allow measurement and reporting of performance for beneficiaries with social risk factors on key quality and resource use measures.
The ability to measure and track quality, outcomes, and costs for beneficiaries with social risk factors over time is crucial as policymakers and providers seek to reduce disparities and improve care for these groups. However, there are two things that would need to be addressed for this to be feasible: first, data would need to be collected on enough beneficiaries for performance assessment by subgroup; and second, statistical techniques to allow calculation for subgroups would need to be developed.

Consideration 2: Consider developing and introducing health equity measures or domains into existing payment programs to measure disparities and incent a focus on reducing them.
Quality measures help providers prioritize areas for particular focus, and specific measures targeting equity within existing value-based purchasing programs can therefore incent a focus on reducing disparities. This could be achieved by adding a health equity measure or domain to existing programs.

Consideration 3: Prospectively monitor the financial impact of Medicare payment programs on providers disproportionately serving beneficiaries with social risk factors.
Many of the programs examined in this report are new or in evolution. Prospectively monitoring the financial impact of Medicare payment programs on providers disproportionately serving beneficiaries with social risk factors is critical as the programs continue to change. One example of such prospective study is the section in this report examining the hospital-wide readmission measure, which has been proposed for implementation in the HRRP. Analyses here demonstrate that moving to such a measure, in the absence of other changes to the program, could disproportionately impact the safety net. Similarly, analyses in this report examining future changes to the HACRP demonstrate that these may negatively impact safety-net hospitals. These types of analyses are important for policymakers to consider as Medicare's value-based purchasing programs continue to evolve.

B. STRATEGY 2: Set High, Fair Quality Standards for All Beneficiaries

Consideration 1: Measures should be examined to determine if adjustment for social risk factors is appropriate; this determination will depend on the measure and its empirical relationship to social risk factors.
There is not an all-encompassing approach to whether or not measures should be adjusted for social risk. These decisions should consider the benefits and concerns of adjustment discussed above. Additionally, empirical evidence on the relationship between the social risk factor and the outcome, including whether there is evidence that need or complexity is driving differences in performance, or if the differences in performance are related to true differences in the quality of care delivered to beneficiaries with social risk factors, should be considered. Such decisions should be continuously evaluated as new data on social risk and better data on medical risk become available and as new measures are introduced into the programs.

Consideration 2: The measure development community should continue to study program measures to determine whether differences in health status might underlie the observed relationships between social risk and performance, and whether better adjustment for health status might improve the ability to differentiate true differences in performance between providers.
Some of the observed relationship between social risk factors and performance on quality measures may be the result of underlying differences in medical complexity, frailty, disability, and/or functional status. For example, dually-enrolled beneficiaries are more likely to have poor functional status, and therefore may be more likely to be readmitted after a hospitalization. However, data on these factors are not broadly available and will require further development. In order for value-based purchasing programs to be as accurate as possible, and to avoid unfairly penalizing providers that serve socially or medically complex beneficiaries, both quality and resource use measures should be continuously improved to account for differences in these and other components of medical risk.

C. STRATEGY 3: Reward and Support Better Outcomes for Beneficiaries with Social Risk Factors

Consideration 1: Consider creating targeted financial incentives within value-based purchasing programs to reward achievement of high quality and good outcomes, or significant improvement, among beneficiaries with social risk factors.
Achievement and/or improvement for beneficiaries with social risk factors should be rewarded, and this could be done via payment adjustments within existing value-based purchasing programs to reward providers that do so. Leveraging the power of value-based purchasing to provide specific payment adjustments to reward providers for successfully achieving high quality and/or good health outcomes in beneficiaries with social risk factors may provide important incentives for doing so, and help offset any real or perceived disincentives under value-based purchasing programs to caring for these beneficiaries. Such opportunities would also highlight the need to focus on these groups to improve outcomes.

Consideration 2: Consider using existing or new quality improvement programs to provide targeted support and technical assistance to providers that serve beneficiaries with social risk factors.
Improving care delivery by providers serving at-risk populations would serve both to reduce disproportionate penalty burdens on these providers, and more importantly, to improve care for the most socially at-risk Medicare beneficiaries.

Consideration 3: Consider developing demonstrations or models focusing on care innovations that may help achieve better outcomes for beneficiaries with social risk factors.
One promising strategy for identifying and testing innovative strategies that may meet the unique needs of beneficiaries with social risk factors is via demonstrations or models. Examples include the demonstration programs in Medicare Advantage that focus on coordinating benefits between Medicare and Medicaid, and CMMI's Accountable Health Communities model.

Consideration 4: Consider further research to examine the costs of achieving good outcomes for beneficiaries with social risk factors and to determine whether current payments adequately account for any differences in care needs.
It might require more resources to achieve good outcomes for beneficiaries with social risk factors, but how much and what type of resources is poorly understood. Future research should determine whether current payments, typically based only on differences in medical risk, adequately account for these differences in care needs. Note that this is a different consideration than additional value-based purchasing adjustments as outlined in Consideration 1 above – this consideration instead refers specifically to whether providers should be paid more to care for beneficiaries with social risk factors via higher base payments, regardless of performance. Disproportionate Share Hospital payments in the hospital setting are one current example of such add-on payments for social risk, and payments to MA contracts to provide care for beneficiaries are also higher for beneficiaries with social risk factors. However, currently, no such provision exists for physicians in the outpatient setting, skilled nursing facilities, dialysis facilities, and other care types. This should be studied.

Table 2 demonstrates how these recommendations and considerations were applied to programs analyzed in this report:

Table 2: Application of Considerations to Programs in this report

Strategies	Considerations	HRRP	HACRP	HVBP	MA Quality Star Program	Medicare Shared Savings Program	Physician VM	ESRD QIP	SNF VBP	HHVBP
Strategy 1: Measure and Report Quality for Beneficiaries with Social Risk Factors	• **Pursue reporting for beneficiaries with social risk factors**	√	√	√	√	√	√	√	√	√
	• **Develop health equity measures**	n/a[1]	n/a[1]	√	√	√	√	√	√	√
	• **Prospectively monitor program impact on providers disproportionately serving beneficiaries with social risk factors**	√	√	√	√	√	√	√	√	√
Strategy 2: Set High, Fair Quality Standards for All Beneficiaries	• **Consider measures for adjustment on a case-by-case basis**	√	√	√	√	√	√	√	√	√
	• **Improve risk adjustment for health status in program measures**	√	√	√	√	√	√	√	√	√
Strategy 3: Reward and Support Better Outcomes for Beneficiaries with Social Risk Factors	• **Provide payment adjustments to reward achievement and/or improvement in beneficiaries with social risk factors**	√	√	√	√	√	√	√	√	√
	• **Use existing or new QI to support providers that serve beneficiaries with social risk factors**	√	√	√	√	√	√	√	√	√
	• **Encourage demos / models focusing on beneficiaries with social risk factors[2]**	√	√	√	√	√	√	√	√	√
	• **Conduct research on the costs of caring for beneficiaries with social risk factors**	√	√	√	√	√	√	√	√	√

n/a=not applicable.
1= Program has a statutorily set list or type of measures; thus this consideration is not applicable
2=Many of these programs do not have demonstration/model authority; the concept would be to design demonstrations or models that addressed key issues salient to beneficiaries with social risk factors, which might influence outcomes under these programs.
HRRP=Hospital Readmissions Reduction Program; HVBP=Hospital Value-Based Purchasing Program; HACRP=Hospital-Acquired Conditions Reduction Program; MA=Medicare Advantage; Medicare Shared Savings Program=Medicare Shared Savings Program; VM=Value-based payment modifier; ESRD QIP=End-Stage Renal Disease Quality Incentive Program; SNF VBP=Skilled Nursing Facility Value-Based Purchasing; HHVBP=Home Health Value-Based Purchasing

V. Conclusions

Social factors are powerful determinants of health. In Medicare, beneficiaries with social risk factors have worse outcomes on many quality measures, including measures of processes of care, intermediate outcomes, outcomes, safety, and patient/consumer experience, as well as higher costs and resource use. Beneficiaries with social risk factors may have poorer outcomes due to higher levels of medical risk, worse living environments, greater challenges in adherence and lifestyle, and/or bias or discrimination. Providers serving these beneficiaries may have poorer performance due to fewer resources, more challenging clinical workloads, lower levels of community support, or worse quality.

The scope, reach, and financial risk associated with value-based and alternative payment models continue to widen. There are three key strategies that should be considered as Medicare aims to administer fair, balanced programs that promote quality and value, provide incentives to reduce disparities, and avoid inappropriately penalizing providers that serve beneficiaries with social risk factors. **Measuring and reporting quality for beneficiaries with social risk factors**, setting **high, fair quality standards for all beneficiaries,** and the **provision of targeted rewards and supports for better outcomes for beneficiaries with social risk factors**, may help ensure that all Medicare beneficiaries can achieve the best health outcomes possible.

VI. Next Steps

The findings outlined in this report represent only the beginning of a body of necessary work around fair and accurate quality measurement in the context of Medicare's increasing use of value-based purchasing programs. The IMPACT Act lays out specific additional requirements for Study B, including the examination of specific social risk factors not currently available in Medicare data such as health literacy, limited English proficiency, and Medicare beneficiary activation (the degree to which beneficiaries have the knowledge, skill, and confidence to manage their health and health care). Based on the findings in this report, future work may also include examining the impact of measuring and accounting for functional status or frailty on the relationship between social risk factors and performance, and identifying care innovations associated with the achievement of good health outcomes for beneficiaries with social risk factors.

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SECTION 1: Introduction, Background, Methods, and Best Practices

This Section contains four chapters: introduction, background on social risk factors, statistical methods, and a review of best practices for achieving good outcomes in beneficiaries with social risk factors.

CHAPTER 1: Introduction

I. Legislative Charge to the Secretary of the Department of Health and Human Services

Section 2(d) of the Improving Medicare Post-Acute Care Transformation (IMPACT) Act of 2014 (Appendix Table 1.1) calls for the Secretary of Health and Human Services (HHS), acting through the Assistant Secretary for Planning and Evaluation (ASPE), to conduct a study evaluating the effect of individuals' socioeconomic status (SES) on quality measures and measures of resource use under the Medicare program. The first component of the required work, referred to in this report as Study A, focuses on socioeconomic information currently available in Medicare data, and specifically mandates a focus on Medicaid eligibility and urban versus rural location.[a] The second component, Study B, expands the analyses by using non-Medicare datasets to quantify SES, and will be completed no later than October 2019 as required by the authorizing legislation.[b] Finally, the Act requires qualitative work to inform and contextualize Studies A and B focusing on data availability and use; this component is referred to as Study C.[c]

This Report presents the results of Study A, along with additional analyses of race and ethnicity. Concurrently, the National Academies of Science, Engineering, and Medicine (NASEM) are preparing a set of five reports commissioned by ASPE as part of this work that will be released sequentially over the course of 2016 and early 2017 for Study C (Appendix Table 1.2); these findings are referred to throughout this Report as applicable. Chapter 14 (Summary of Findings, Conclusions, and Next Steps) includes information on future research that will be conducted as part of Study B as well as additional work that could be pursued to further deepen understanding of the relationship between social risk and performance.

II. Background: Paradigm Shifts in Medicare Payment Policy and the Move to Delivery System Reform

Since its inception in 1965, the federal Medicare program has used standards and oversight to help ensure that Medicare beneficiaries receive high quality health care. For example, in the initial Medicare legislation, "conditions of participation" were established to ensure that providers serving Medicare beneficiaries met basic quality standards. As tools and methods evolved, the Medicare program implemented new programs to monitor quality, first measuring how care is delivered (the *processes* of care), and later, measuring the results (*outcomes)* of that care. Initially, these measures were intended

[a] Improving Medicare Post-Acute Care Transformation (IMPACT) Act of 2014, Section 2(d)(1)(A)
[b] Improving Medicare Post-Acute Care Transformation (IMPACT) Act of 2014, Section 2(d)(1)(B)
[c] Improving Medicare Post-Acute Care Transformation (IMPACT) Act of 2014, Section 2(d)(1)(C)

for use in internal quality improvement efforts, but subsequently Medicare moved to report performance publicly, beginning with managed care plans in 1999.

Since 2005, hospital performance has been reported on the *Hospital Compare* website[1] to inform consumers about health care quality and to promote care improvements. Process measures were the first measures to be publicly reported, focusing on heart attack, heart failure, and pneumonia; outcomes for these conditions were reported starting in 2007. Similar reporting programs have subsequently been developed for nursing homes,[2] dialysis facilities,[3] and physicians.[4]

Despite this increased focus on quality reporting, until recently providers were still paid largely under a volume-based paradigm, that is, they were paid for the number of services provided irrespective of quality or value. With the Affordable Care Act, Medicare's payment paradigms shifted to explicitly link many Medicare payments to the quality and efficiency of health care. For example, Medicare's Hospital Value-Based Purchasing Program (HVBP) that began in 2012 ties a portion of hospitals' fee-for-service Medicare payments for inpatient services to performance on processes, outcomes, efficiency, and patient experience.

Additional value-based purchasing programs are underway or in development in nearly all Medicare settings, including in hospitals, in the ambulatory domain for physicians and dialysis facilities, in the post-acute setting for skilled nursing facilities and home health agencies, and across health care sectors in Medicare Advantage. Payment arrangements broadly referred to as alternative payment models (APMs), such as Accountable Care Organizations (ACOs) and bundled payments, are also gaining prominence within the Medicare payment portfolio. Payment arrangements referred to as APMs vary substantially, and specific definitions may vary by payer, but these types of payment models generally put providers at risk both for the cost of care and the quality of care.

By all indications, this trend away from volume and towards value will continue. In 2015, Sylvia Burwell, the Secretary of HHS, announced the department's goals to have 30% of Medicare payments in APMs by 2016 and 50% by 2018, and to tie 85% of remaining fee-for-service payments to value by 2016 and 90% by 2018.[5] Subsequent announcements have demonstrated that HHS has met this goal for 2016, and is on track to meet or exceed future goals, reflecting the rapid shift in the Medicare program's payment paradigm.

Many of these programs are built around one or more quality and/or resource use measures. Quality and resource use measures can be and are used for multiple purposes. Some measures are used purely for quality improvement, typically within a health care system or clinical practice to identify and track specific clinical areas for improvement. Many of these measures are processes of care that are based upon steps within clinical practice guidelines, such as whether or not a Hemoglobin A1C was ordered for diabetic patients. Generally, measures used for this purpose are not risk adjusted at all, even for clinical co-morbidities, as providers are most interested in using these measures to track performance within their organization, and not for comparative performance purposes.

Most measures used within the Medicare programs are used for public reporting and accountability, or value-based purchasing, although they may also be valuable for providers to track quality improvement. These measures are typically used to profile providers against one another, usually as a requirement of the statute authorizing the quality or value-based purchasing program. In order to "level the playing field," these quality and resource use measures may be adjusted for a variety of risk factors, most commonly age and clinical co-morbidities. The goal of risk adjustment is to fairly compare providers to one another on patient outcomes, such that the main differences in performance are related to the quality of care provided, rather than to patient factors over which providers have no control, such as clinical conditions.

It is measures used for public reporting and payment that are the topic of this report. However, for the purposes of this report, analyses largely focus on payment – considerations and solutions discussed here are presented in the context of how they would impact payment, rather than whether they should be used for quality reporting. To provide the most comprehensive evaluation possible of the relationship between social risk and performance under Medicare's value-based purchasing programs, a broad range of programs were examined. Programs were selected for analysis if they were currently operational or defined in statute, and if they incorporated quality and/or efficiency metrics into payments. The programs ultimately included in the report are shown in Table 1.1:

Table 1.1: Medicare Payment Programs Included in this report

Program	Metric Types Currently Included in Program
1) Hospital Readmissions Reduction Program	Outcomes of care
2) Hospital Value-Based Purchasing Program	Processes of care, Outcomes of care, Patient safety, Patient experience, Efficiency
3) Hospital Acquired Condition Reduction Program	Patient safety, Outcomes of care
4) Medicare Advantage (Part C) Quality Star Rating Program*	Processes of care, Outcomes of care, Patient experience
5) Medicare Shared Savings Program	Processes of care, Outcomes of care, Patient experience, Costs
6) Physician Value-Based Payment Modifier Program†	Processes of care, Outcomes of care, Patient experience, Efficiency, Costs
7) End-Stage Renal Disease Quality Incentive Program	Processes of care
8) Skilled Nursing Facility Value-Based Purchasing Program‡	Outcomes of care
9) Home Health Value-Based Purchasing Program‡	Outcomes of care, patient experience

*Includes Part D metrics where applicable. †Note that this program sunsets, and is replaced by the Merit-Based Incentive Payment System (MIPS) in 2019. ‡The SNF VBP program is not yet operational at the national level, and HHVBP is too new to have program-level data yet available for analysis; for this Report, only measures from these settings were analyzed.

Note that throughout this report, the word "providers" is used inclusively, to indicate hospitals, physicians, health plans, dialysis facilities, skilled nursing facilities, and home health agencies.

ASPE worked closely with CMS staff to ensure full understanding of current Medicare measure calculations and payment methodologies, as well as with experts from other parts of the Department,

including the Federal Office of Rural Health Policy in the Health Resources and Services Administration (HRSA), the Centers for Disease Control and Prevention (CDC), and others (Appendix Table 1.3). Technical Expert Panels were also convened for input on the proposed analytic plans for each program and on study findings as they emerged (Appendix Table 1.4).

III. Socioeconomic Status, Social Risk Factors, and Medicare Payment Policy

Given the long list of programs above, it is clear that payment paradigms are shifting across care settings, and will impact a broader and broader set of providers and payments. Such an expansion has, however, led to a number of important concerns being raised. As Medicare payments are increasingly based on performance, concerns have been raised about the fairness and equity of performance assessment for providers that serve beneficiaries who may present unique challenges to achieving good outcomes – particularly those beneficiaries considered to have low socioeconomic status.

A. Defining Socioeconomic Status and Social Risk

In order to examine issues related to socioeconomic status, one first needs a definition of this concept. Therefore, one of the first steps ASPE took under the IMPACT Act work was to ask the National Academies of Science, Engineering, and Medicine (NASEM) to define and conceptualize socioeconomic status for the purposes of Study A and Study B. The NASEM convened a panel of experts in the field and conducted an extensive literature review. Based on the information collected, their first report concluded that the appropriate framework is that of social risk factors instead of socioeconomic status. Social risk factors include socioeconomic position, race, ethnicity, gender, social context, and community context.[6] These factors are discussed at length in Chapter 2. Consequently, in this report the term "social risk factors" will be used, rather than the term "socioeconomic status" or "sociodemographic status."

B. The Debate Over Accounting for Social Risk

There is a great deal of debate regarding whether or not social risk should be accounted for in Medicare's value-based purchasing programs and alternative payment models. These issues are not purely theoretical. Recent research has suggested that current Medicare hospital-based payment programs such as the Hospital Readmission Reduction Program (HRRP), Hospital Value-Based Purchasing Program (HVBP), and Hospital-Acquired Conditions Reduction Program (HACRP) have been more likely to penalize safety-net hospitals.[7-11] Bills have been proposed in both the U.S. House and Senate to allow the Secretary to alter the HRRP to account for social risk.[12,13] The Medicare Payment Advisory Commission (MedPAC) has also recommended changes to the HRRP based on accounting for socioeconomic factors.[14] Additionally, the National Quality Forum (NQF) recently released a report on this issue,[15] and is currently conducting a trial period in which they have asked measure developers to conduct analyses examining whether measures should be adjusted for sociodemographic status.[16]

i. Adjusting quality and resource use measures

The first question is whether to adjust the measures themselves. Some have argued that measures used for public reporting and accountability should be adjusted for social risk factors, in order to "level the playing field." Advocates of this approach argue that adjusting measures for social risk factors

recognizes the greater challenges that may be faced in achieving high performance for beneficiaries with social risk factors, and may reduce the likelihood that concerns about performance could lead to worse access to care for these groups by penalizing providers who serve them. They also argue that failing to adjust for differences in the populations served by different providers may lead to inaccurate representations of the quality of care a provider is furnishing to patients. Advocates of this view argue that, without adjustment, some of the differences in reported performance reflect differences in the populations providers serve, rather than the performance of the providers themselves.

Supporters of adjusting measures for social risk factors note that there may be situations in which measure performance is so closely tied to social risk and its consequences, in ways that are truly beyond providers' control, that achieving policy goals necessitates adjustment. For example, there is significant evidence that dually-enrolled beneficiaries, on average, are more medically complex and have higher healthcare needs. Therefore, poor performance on measures of care utilization may reflect patient need or complexity rather than poor quality of care, and failing to adjust may penalize providers for providing additional needed services to these groups. Currently, some care utilization measures, as well as the self-reported health status measures used in the Medicare Advantage program and the patient experience measures used in many current Medicare payment programs, are adjusted for social risk.

Others, however, have argued that adjustment for social risk is not appropriate. First, they argue that adjusting measures for social factors risks masking disparities in the quality of care provided, thereby significantly reducing the long-term ability to identify and reduce them. Second, at least to the degree that differences in quality are related to poor performance, bias, or discrimination, they argue that directly adjusting measures could excuse the delivery of worse care to beneficiaries with social risk factors. Third, opponents of adjusting for social risk suggest that doing so may reduce incentives for providers to participate in alternative care delivery models, and therefore providers may miss opportunities to provide better-coordinated and tailored care to vulnerable beneficiaries. Finally, they argue that adjusting the measures may have a negative impact on transparency for consumers and others.

Opponents of adjusting measures also argue that broad adjustment is inappropriate because there are many quality measures for which there is no plausible role for adjustment – pure process measures such as giving aspirin for a heart attack, for example, should generally not be adjusted for social risk since they are entirely under providers' control, and should be done regardless of a beneficiary's social risk profile. Under this theory, there is no reason that social risk should be directly associated with performance on process measures, and poor performance in these scenarios is more likely reflective of poor quality than of need or complexity. Currently, the majority of process and clinical outcome measures used in Medicare payment programs are not adjusted for social risk.

One reason the topic remains controversial is that the underlying reasons for these patterns are poorly understood. Research has shown that social risk is strongly related to outcomes; however, research has also demonstrated that providers that disproportionately serve poor and minority beneficiaries may provide lower quality of care (see Chapter 2 for a review of literature in these two areas).

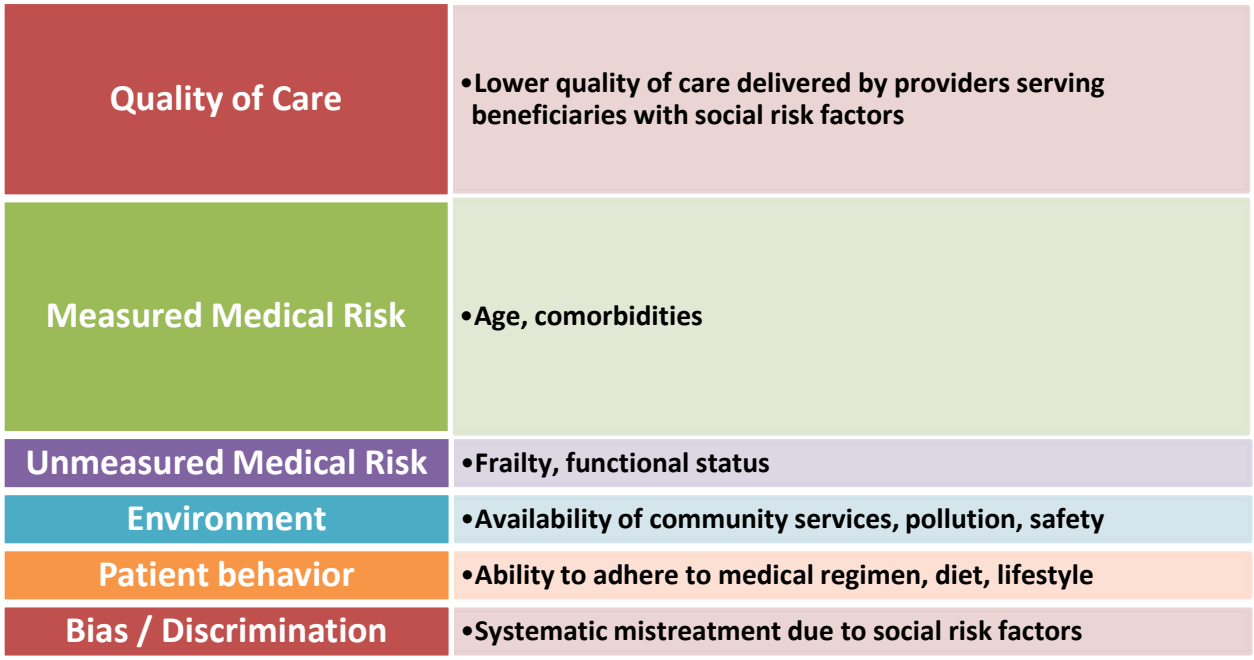
Therefore, three key questions must be answered in order to determine whether social risk factors should be accounted for. 1) Is the social risk factor related to the outcome? 2) If so, is the social risk factor directly related to the outcome, or is it mediated by other factors; and 3) If there are mediating factors, are those factors beyond the control of the provider?

Answering the first question is relatively straightforward, and makes up a large part of the analyses contained in this report. Simple regression analyses can be run to evaluate whether social risk factors and outcomes are related – for example, whether beneficiaries who are dually enrolled in both Medicare and Medicaid, and thus presumably lower-income than their peers, are more likely to be readmitted, or whether rural beneficiaries have a higher risk of mortality than urban ones.

The second and third questions are much more difficult. Prior literature would suggest that the mechanisms linking social risk and poor outcomes are broad, and include individual factors, provider factors, and community factors. Some of these factors are outside providers' control (e.g. higher burden of comorbidities or worse functional status in dually-enrolled beneficiaries versus non-dually-enrolled beneficiaries), some are debatable as to whether they are outside the control of the provider, and may be in some cases but not others (e.g. availability of community resources, adherence to medical regimens), and some are fully under providers' control (e.g. bias or discrimination).

Figure 1.1 illustrates the disparate factors that may contribute to differences associated with various social risk factors, in this case for readmission. Please note the relative size of the boxes presented here are provided for illustrative purposes only:

Figure 1.1: Theoretical Factors Contributing to Differences Between Risk of Readmission for Beneficiaries With vs. Without Social Risk Factors



Therefore, there are a number of factors (presumably including many factors not listed above) that may contribute to differences, some of which are under a provider's control, and some of which are not.

Ideally, analyses would first identify where differences in quality and outcomes exist and then dig into the "why" by examining each underlying factor more deeply. Unfortunately, many of the factors on the list above are not included in claims data, and some are not practically measureable on a large enough scale to be of use. For example, beneficiaries' functional status is only measured in the post-acute setting, and adherence to medical recommendations is not currently measured in any systematic way. Bias is an even more difficult factor to measure. Therefore, the analyses contained in this report cannot sort out each of these components.

Because the individual components cannot be easily teased apart, the issues of whether or not to adjust for social risk, as well as how to do so – are controversial. For example, simply adjusting for dual enrollment status would take all of the above factors into account, when an ideal adjustment would only account for the components known to be outside providers' control. Deciding how to proceed, in the absence of an ideal adjustment, is therefore difficult.

ii. Adjusting payments

Whether a decision is made to adjust the measures themselves for reporting purposes, a separate decision is possible with regard to adjusting payment (penalties and bonuses) for social risk. One option is to base the penalty/bonus calculation on adjusted measures; this has some of the pros and cons above, though does not negatively impact transparency since the adjustment is applied after reporting.

However, another option for accounting for social risk in Medicare's value-based purchasing programs lies in not adjusting the measures themselves, but instead in altering the mechanism by which performance is translated to payment. Such alterations could be used to give additional "credit" to providers that serve a high proportion of beneficiaries with social risk factors. If these payment adjustments were linked to improvement or achievement in performance for beneficiaries with social risk factors, they could potentially provide additional incentives to improve care and outcomes for these groups, and provide financial support while preserving accountability.

Such an approach preserves the transparency of the measures, but still recognizes the challenges inherent in achieving high quality and good outcomes for beneficiaries with social risk factors. It might also offset concerns that in the absence of some type of accounting for social risk, value-based purchasing models could result in providers becoming reluctant to care for beneficiaries with social risk factors, out of fear of incurring penalties due to elements they have limited ability to influence.

iii. Addressing the Problem Directly

Finally, some point out that neither adjusting the measures, nor altering value-based payments, addresses the fundamental problems underlying the pervasive differences in performance across measures and programs. Social determinants of health are powerful, and to make things better for beneficiaries with social risk factors and the providers who serve them, these factors need to be

explicitly measured and their impact tracked, perhaps via the use of new measures that specifically capture providers' performance for beneficiaries with social risk factors. Such new measures could include calculating performance on current measures for subgroups of beneficiaries with social risk factors, or specific measures of health equity comparing performance between beneficiaries with social risk factors and other beneficiaries.

Once measured and recognized, these issues could be addressed with financial and technical assistance. Such assistance should be tailored to recognize the unique characteristics of beneficiaries with social risk factors and the providers that disproportionately serve them, and directed toward the goal of achieving highest quality of care for all patients.

Given the nature of this debate, any HHS decisions regarding whether to account for social risk in Medicare payment programs, and if so, how, may have significant implications for future decisions in this area. Therefore, any such decisions should be made with a consideration of the pros, cons, and alternatives, as well as a consideration of the beneficiary perspective.

C. Policy Criteria

In order to work through these issues systematically, a set of policy criteria were constructed:

1. *Encourages reduction in disparities in quality and outcomes*
   Reducing disparities is a national and Departmental priority, and therefore an ideal policy has a positive and active impact on reducing disparities in these domains.

2. *Protects beneficiaries' access to care by reducing disincentives to caring for high-risk populations*
   An ideal policy works to assure that beneficiaries with social risk factors have access to care, by assuring that providers treating disproportionate shares of beneficiaries with social risk factors are not monetarily disincented from doing so. A potential unintended consequence of the move towards value-based purchasing programs would be to put incentives in place to limit providers' interest in caring for beneficiaries with social risk factors or other groups perceived to be at high risk of poor outcomes or high costs; the ideal policy would dampen these unintended consequences.

3. *Protects providers from unfair financial stress*
   An ideal policy recognizes that financial risk under delivery system reform should be applied as fairly as possible. While financial stress that is the result of poor quality is acceptable – it is, in fact, the mechanism and intent of value-based purchasing programs – financial stress that is not reflective of the quality of care delivered may not be fair, and may threaten the viability or availability of health care for at-risk populations. It would be an unintended consequence of delivery system reform efforts to undermine the financial viability of these providers.

4. *Adjusts only for the difference in performance related directly to the social risk factor, and only for what is beyond provider control.*

An ideal policy adjusts only for the degree and magnitude of the difference in performance related directly to the social risk factor, and does not adjust for differences more broadly, which may be reflective of poor quality. Further, an ideal policy adjusts only for what is beyond provider control, and avoids adjusting for factors under a provider's control such as bias or discrimination. However, the concept of being "beyond provider control" is a difficult one – is the quality of outpatient care available in a community outside a hospital's control, or can the hospital influence such care? Is the availability of affordable housing, or nutritious food, or safe places to exercise, beyond physicians' control, or can physicians influence these factors? This criterion therefore requires careful consideration and application.

5. *Promotes transparency to facilitate consumer choice*
   Consumer choice is an important component of incenting providers to work to provide increasingly high-quality, high-value care. Policies that fail to promote or preserve transparency could negatively impact delivery system reform efforts.

6. *Supports delivery system reform and Alternative Payment Models*
   Another important policy goal is to support ongoing efforts at delivery system transformation more broadly. Delivery system reform aims to move beneficiaries and providers into alternative payment/delivery models that focus on person-centered, coordinated and comprehensive care; these models may be particularly beneficial for beneficiaries with social risk factors, who may have complex care needs. Beneficiaries with social risk factors could receive better care in these models, and providers that treat large shares of these beneficiaries could improve their quality by being part of these systems. Thus, each policy alternative should be evaluated against the incentives or disincentives they may create for providers to join alternative payment models.

D. Policy Options

A set of policy options that can be applied across Medicare payment programs was constructed to evaluate the programs in this Report. They each have pros and cons, and may or may not fully meet the criteria outlined above. The details of implementation vary by program and measure, but a broad overview is provided below:

1. Adjustment for Social Risk Factors

Adjusting for social risk factors refers to adding the risk factor in question directly to the risk-adjustment models for quality and resource use measures, where feasible. This could be done both for public reporting and payment purposes, or only for payment purposes; in this report, the impact of adjustment on payment was the focus on simulations. In some programs (for example, the HRRP, which only includes readmission measures), all measures could be directly adjusted. In others, indirect approaches were needed when the data were not structured to allow direct adjustment.

2. Stratification by Social Risk Factors

Under the stratification or tiering strategy, providers were broken into groups by their proportion of beneficiaries with social risk factors. Provider performance was then re-calculated, such that the benchmarks for achievement were group-specific, and each provider was only being compared to its "peers"—defined as providers that had a similar patient population in terms of beneficiary mix.

3. Rewarding Improvement

Under the rewarding improvement strategy, mechanisms were developed to calculate the change in performance over time and apply this change to the programmatic calculation of penalties or bonuses. Again, the strategies differed by program (and some programs already reward improvement), but the overarching goal was to allow providers that demonstrated significant improvement to reduce their penalty or gain an offsetting bonus, even if they had not met performance benchmarks.

4. Targeted Payment Adjustments: Additional Payment Adjustments for High Performance in High Social Risk Patients and/or Direct Support for Quality Improvement

This set of policy options was specifically designed to incent high performance for beneficiaries with social risk factors, recognizing improved care and outcomes in these groups as an important goal. Though variable by program, these payment adjustments could, for example, provide a financial incentive if a hospital were able to achieve low readmission rates for its dually-enrolled beneficiaries. Additionally or alternatively, direct support, either financially or in terms of technical assistance, could be targeted to providers serving beneficiaries with social risk factors to improve performance.

It is unlikely that any single policy option could satisfy each of the criteria listed above. Therefore, policymakers will have to contemplate tradeoffs as they consider potential courses of action. One could consider constructing a grid of the criteria and policy options to aid in decision making (Table 1.2):

Table 1.2: Policy Criteria and Options

	Direct Adjustment of Measures	Stratification by Social Risk	Rewarding Improvement	Targeted Payment Adjust-ments
1. Encourages reduction in disparities in quality and outcomes				
2. Protects beneficiaries' access to care by reducing disincentives to caring for high-risk populations				
3. Protects providers from unfair financial stress				
4. Adjusts only for the difference in performance related directly to the social risk factor, and only for what is beyond provider control				
5. Promotes transparency to facilitate consumer choice				
6. Supports delivery system reform				

Different individuals may weigh the criteria differently, but stating and evaluating the criteria and considerations allows for the most transparent consideration possible of the many available options.

E. Strategies and Considerations

The Department's goal is to develop value-based payment programs under which *all* Medicare beneficiaries receive the highest quality healthcare services. In the context of the findings above, however, it is clear that doing so will require a multipronged approach, as proposed solutions that address only the measures without considering the broader delivery system and policy context are unlikely to mitigate the full implications of the relationship between social risk factors and outcomes. Ideally, value-based purchasing programs can be leveraged to enhance, rather than threaten, access to and provision of high-quality care for beneficiaries with social risk factors.

Therefore, the Department proposes for consideration a three-part strategy (Figure 1):

Figure 1. Strategy for Accounting for Social Risk in Medicare's Value-Based Purchasing Programs

First, performance on quality and outcomes should be **measured and reported specifically for beneficiaries with social risk factors**. Doing so would allow policymakers and clinical leaders to identify, track, and address disparities in care.

Second, **high, fair quality standards** should be set for all beneficiaries. Whether the most "fair" standard is one that does or does not adjust for social risk will depend on the type of measure and how the considerations outlined earlier apply to that particular measure. Additionally, all measures should be studied to determine whether accounting for frailty, medical complexity, functional status, or other factors might improve their ability to fairly and accurately assess provider performance.

Meeting quality standards, particularly for outcome measures, may be harder for beneficiaries with social risk factors, who face specific challenges to achieving good health outcomes. Therefore, value-based purchasing programs should:

a) provide **specific payment adjustments to reward achievement and/or improvement for beneficiaries with social risk factors,** and

b) where feasible, **provide targeted support** for providers who disproportionately serve them.

First, leveraging the power of value-based purchasing to provide specific payment adjustments to reward providers for successfully achieving high quality and/or good health outcomes in beneficiaries with social risk factors may provide important incentives to focus on these individuals, and help offset any real or perceived disincentives to caring for them.

Second, providing targeted support, for example through quality improvement programs designed specifically for beneficiaries with social risk factors, is also critical to ensuring that all beneficiaries can have the best health outcomes possible. Another key component of support is ensuring that current base payments are adequate to support high-quality care for beneficiaries with social risk factors.

Considerations for how these strategies might be applied to Medicare payment programs are provided below. Note that these are general considerations, and not all apply to each program reviewed.

STRATEGY 1: Measure and Report Quality for Beneficiaries with Social Risk Factors

The first step in addressing social risk factors in Medicare is measuring, tracking, and reporting their impact. Reporting performance specifically for beneficiaries with social risk factors is a critical component in illuminating health disparities and placing a priority on reducing them (criterion #1). Failing to measure and report performance for beneficiaries with social risk factors could impede progress toward ensuring Medicare's value-based purchasing programs have their intended effects and are not associated with unintended consequences. This strategy is currently being explored by the Office of Minority Health at CMS, which recently began posting quality information stratified by race and ethnicity on their website for public viewing. Another important component of measuring and reporting quality for beneficiaries with social risk factors is the development and use of health equity measures or domains to specifically measure disparities in care. Finally, monitoring the financial impact of Medicare payment programs on providers disproportionately serving beneficiaries with social risk factors is critical as the programs continue to change.

STRATEGY 2: Set High, Fair Quality Standards for All Beneficiaries

The second strategy is setting a **high, fair standard** for quality and resource use measures. However, there is not an all-encompassing approach to whether or not measures should be adjusted for social risk. These decisions should consider the benefits and concerns of adjustment discussed above. Additionally, empirical evidence on the relationship between the social risk factor and the outcome, including whether there is evidence that need or complexity is driving differences in performance, or if the differences in performance are related to true differences in the quality of care delivered to beneficiaries with social risk factors, should be considered.[17-19] [20-22] Such decisions should be continuously evaluated as new data on social risk and better data on medical risk become available and as new measures are introduced into the programs.

STRATEGY 3: Reward and Support Better Outcomes for Beneficiaries with Social Risk Factors

To encourage improvement in care and outcomes for beneficiaries with social risk factors, and to avoid creating disincentives to caring for beneficiaries with social risk factors (criterion #2), high standards and reporting must be coupled with **targeted payment adjustments to reward improvement and/or achievement** in beneficiaries with social risk factors. These interventions could help reduce the disproportionate burden of payment penalties on providers that disproportionately serve beneficiaries with social risk factors by making them eligible for additional adjustments for performance (criterion #3), and even enhance the potential for success in delivery system reform and Alternative Payment Models (criterion #6).

Finally, meeting high quality standards is often more difficult among beneficiaries with social risk factors, and may require **additional support and/or resources**. For example, achieving high cancer screening rates in beneficiaries who lack access to transportation, or achieving adequate control of blood sugars in beneficiaries who have unstable housing, presents challenges beyond those faced in delivering high quality care to beneficiaries who do not have these needs. Community engagement strategies may have a particular role to play here as well. Therefore, specific targeted support for quality improvement should be provided to the providers that disproportionately care for beneficiaries with social risk factors.

This set of strategies –measure and report performance; set high, fair standards; and provide targeted reward and support –are not mutually exclusive – for example, policymakers could choose both to adjust resource use measures for social risk and also to provide additional payment adjustments for high performance for beneficiaries with social risk factors, or to provide targeted quality improvement support. Indeed, a multi-pronged approach employing all three strategies is likely needed to ensure that Medicare's value-based purchasing programs adequately account for social risk, help drive improvements in care and outcomes for at-risk beneficiaries, and do not cause unintended consequences as they continue to expand.

Considerations regarding how these strategies might be applied within each program can be found in Chapters 5 through 13. Specific considerations vary by program, because each program is structured differently, uses a different combination of metrics that may have different relationships with social risk, and assesses bonuses or penalties differently.

IV. Structure of This Report

Following this introductory chapter, there are three more chapters in Section One: Introduction, Background and Methods. Section Two addresses hospital value-based purchasing programs; Section Three addresses the programs that focus at least in part on quality and/or costs in the ambulatory setting; and Section Four focuses on dialysis facility and post-acute value-based purchasing models. Each of the program chapters follows a similar structure, presenting analyses, policy simulations, and strategies and considerations. Section Five (Chapter 14) summarizes findings across all studies and discusses themes and future areas of work. Detailed methodologies for each of the programs analyzed, as well as additional findings not contained in the main body of the report, are presented in companion technical appendices for the program-specific analyses contained in Chapters 5 through 13.

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CHAPTER 2: Social Risk Factors

As noted in Chapter 1, prior research has definitively shown that social risk factors are related to a variety of health outcomes across settings, providers, and practices. Though gaps in life expectancy between Black and White individuals have fallen in recent years,[1] gaps are actually widening for income-related disparities[2,3] and for rural-urban disparities.[4] Healthy People 2020 calls attention to all of these disparities as a major national health priority.[5] This chapter provides a brief overview of the research related to the social risk factors included in Study A, including the relationship between these factors and health outcomes and the way in which these variables were collected.

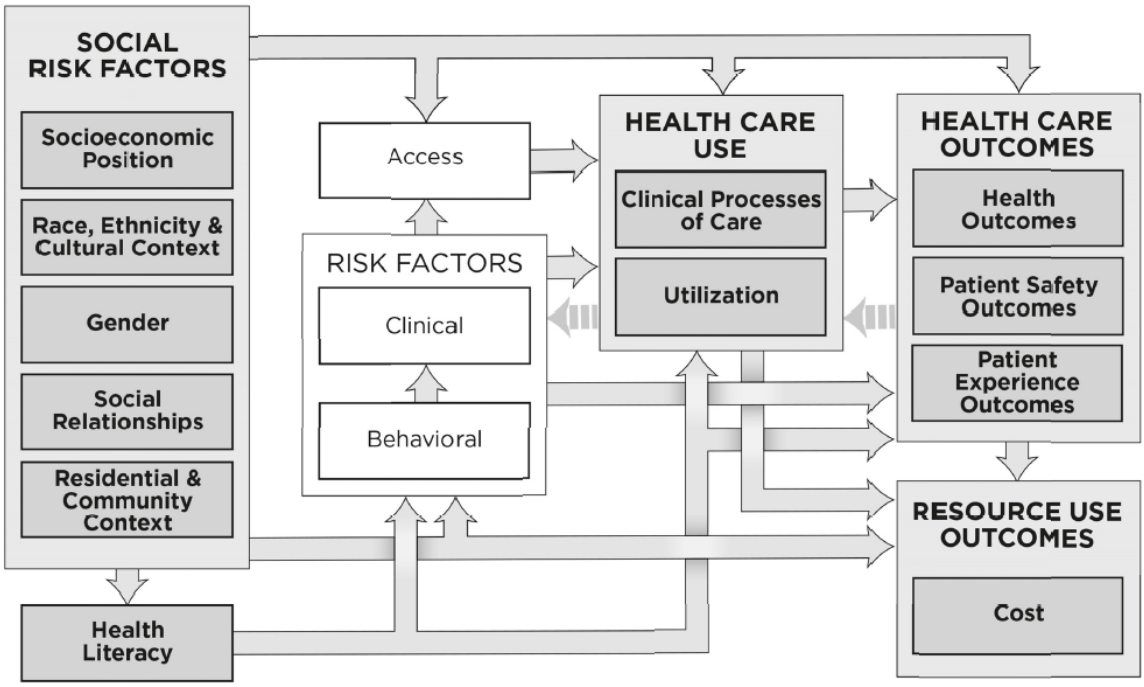
I. Defining Socioeconomic Status and Social Risk Factors

Socioeconomic Status (SES) has been conceptualized in different ways, and can be difficult to measure adequately. Given this complexity, ASPE asked the National Academies of Sciences, Engineering, and Medicine (NASEM) to help create a conceptual framework for this work. Their first report, entitled "Accounting for Social Risk Factors in Medicare Payment: Identifying Social Risk Factors"[6] identified and thoroughly reviewed five key social risk factors and one independent, non-social risk factor that should be considered when addressing the issue of social needs and Medicare payment policy:

1. Socioeconomic Position (SEP), which includes income, insurance, education, and occupation;
2. Race, ethnicity, and cultural context;
3. Gender and sexual orientation;
4. Social relationships, including social support;
5. Residential and community context, including neighborhood deprivation and rurality; and
6. Health literacy (independent risk factor rather than social risk factor)

The Committee noted that it expected the effect of the social risk factors to be similar across Medicare subpopulations, including beneficiaries with disabilities and ESRD, and older adults. These social risk factors are associated with health care use and outcomes through a variety of mechanisms, as shown in the conceptual model below:

Figure 2.1. National Academies of Sciences, Engineering, and Medicine's Conceptual Framework of Social Risk Factors for Healthcare Use, Outcomes, and Cost



Source: National Academies of Sciences, Engineering, and Medicine. Accounting for Social Risk Factors in Medicare Payment: Identifying Social Risk Factors. Washington, DC: National Academies of Sciences, Engineering, and Medicine; 2016.

The NASEM concluded in their report: "Thus, all other things being equal, the performance of a given health care system (in terms of quality, outcomes, and cost) can undoubtedly be affected by the social composition of the population it serves….Health literacy and social risk factors (SEP; race, ethnicity, and cultural context; gender; social relationships; and residential and community context) have been shown to influence health care use, costs, and health care outcomes in Medicare beneficiaries."[6]

For the purposes of this Report, analyses were limited to those social risk factors for which data were available in current Medicare administrative files. These factors include income, insurance, race, ethnicity, and community factors, including rurality. Data are not currently available across the Medicare population on education, employment, sexual orientation, gender identity, or social relationships. Gender is ubiquitous in risk adjustment for Medicare's payment programs because it is currently available in claims data, and as such, specific analyses on gender were not conducted. Disability was also considered to be an important related risk factor in this study. Though not a social risk factor per se, it is a key metric of high medical risk available in current Medicare enrollment data and is already used in some Medicare payment programs. It is also closely linked to many social risk factors, as well as to health outcomes.

II. Research on Social and Related Risk Factors Included in Study A and Health Outcomes

As noted above, prior research has definitively shown that social risk factors are related to a variety of health outcomes, across settings and providers. This chapter provides a brief overview of the research related to the factors included in Study A; for a more thorough review of social risk factors more broadly, please refer to the National Academies of Sciences, Engineering, and Medicine's report "Accounting for Social Risk Factors in Medicare Payment."[6]

A. Income

A large body of work has shown that income is associated with health care quality and outcomes, as well as life expectancy.[7] Prior studies, many of which used Medicaid enrollment as a proxy for low income, have shown that low-income beneficiaries have higher hospital admission, readmission, and mortality rates for a number of medical and surgical conditions.[8-11] Income is also related to health care quality and outcomes when studied in the outpatient setting; low-income beneficiaries receive lower-quality care and have worse outcomes on metrics included in clinical quality programs for outpatient care such as diabetes control and cancer screening.[12-15] In the post-acute setting, outcomes are again related to income; Medicaid-enrolled beneficiaries tend to be admitted to lower-quality skilled nursing facilities than non-dually-enrolled beneficiaries,[16] and may have less access to home-based post-acute care (or HCBS).[17] Some research suggests that access to home health, rehabilitative, and long-term care services including HCBS may be worse for low-income populations, though less is known about patterns of care and access in these settings.[18,19]

B. Race and Ethnicity

The IOM's 2002 landmark report "Unequal Treatment" provided extensive documentation that race and ethnicity are closely tied to overall health and specific health outcomes.[20] Both Black and Hispanic Americans have lower life expectancies and higher rates of chronic disease than their White counterparts. People who self-identify as racial or ethnic minorities are at higher risk of readmission following hospitalization[21-24] and have worse experience with hospital care than non-minority populations (as measured by patient experience surveys).[25] Paradoxically, for in-hospital mortality measures, findings are more mixed: prior studies have shown significantly lower mortality following acute myocardial infarction, heart failure, and pneumonia for Black and Hispanic Medicare beneficiaries; findings are particularly striking for Hispanics, with up to 50% lower cardiovascular mortality reported in multiple studies.[26-30]

Race and ethnicity-based differences are also evident in the ambulatory setting. Hospital admissions for ambulatory care-sensitive conditions, or those conditions for which high-quality primary care should decrease the likelihood of hospitalization, are higher for racial and ethnic minorities.[31] In addition, racial and ethnic minorities have lower rates of diabetes and hypertension control,[32] and consequently, higher rates of heart attack, stroke, and other long-term consequences of these conditions.[33] While survival with chronic kidney disease is worse for Black and Hispanic beneficiaries compared to Whites,[34] studies have documented a survival advantage for Black and Hispanic beneficiaries on dialysis compared to White beneficiaries.[35,36] In the post-acute setting, racial and ethnic minorities are more likely to go to

low-quality skilled nursing facilities and to be readmitted to the hospital after being discharged to a post-acute care facility.[37-39]

The majority of prior work has focused on Black-White and Hispanic-White differences; much less is known for Asian Americans, Native Hawaiians, and other Pacific Islanders, American Indians, and Alaska Natives.

C. Community Factors, including Rurality

Community context can influence a host of important social risk factors, from income to education to access to healthy food. It can also be used as a proxy for individual social risk. For example, studies have shown that individuals from socioeconomically disadvantaged neighborhoods have higher hospital readmission rates than those living in less-deprived neighborhoods, independent of individual markers of social risk.[40] Neighborhood disadvantage has also been associated with higher mortality after myocardial infarction[41] and stroke.[42]

Rurality is another important component of community identity, and is associated with differential health outcomes compared to living in more urban areas. Persons living in rural communities have higher rates of chronic illness[43] and poorer access to generalist and specialist outpatient care than those living in urban areas.[44] Further, individuals seeking hospital care in rural areas have worse outcomes for common inpatient conditions such as heart attacks, heart failure, and pneumonia,[45,46] and are more likely to visit the emergency department after discharge.[47] However, readmission rates are similar or lower for beneficiaries in rural areas,[48,49] and reported patient experience is better.[50,51] In the ambulatory setting, findings are mixed on the quality of care received in rural versus urban areas.[52-54] Findings are also ambiguous in post-acute settings: rural beneficiaries may encounter poor quality in the hospice setting[55] and are more likely to be admitted to low-quality nursing homes,[56] but readmission rates from home health settings are lower in rural areas.[57]

D. Disability

Though not a social risk factor, disability is a key metric in current Medicare enrollment data because disability can confer Medicare eligibility (see next section), and it is closely linked to many social risk factors. For example, Medicare beneficiaries under 65 years of age with disabilities are much more likely to be poor and to self-identify as racial or ethnic minorities.[58,59] People with disabilities may face significant barriers to education and employment.[60] Disability is also an independent predictor of poor mental and physical health outcomes; over half of the Medicare population with disabilities under 65 reports a mental health diagnosis, and beneficiaries with disabilities are much more likely to report being in poor overall health.[59] Individuals with disabilities may receive lower-quality preventive care[61] and have worse outcomes for medical conditions such as cancer.[62] Disability status is currently used for Medicare Advantage (MA) payment determination, as disability is included in the CMS Hierarchical Condition Categories (HCC) risk adjustment system, and it is included in risk adjustment in some of the quality measures examined in this report.

III. Social and Related Risk Factors Included in this Study

To assess the relationship between social risk factors and performance on the metrics in Medicare payment programs, social risk factors had to be identified and defined using existing Medicare data. Variables selected for the study are summarized in the table below, with a description following.

Table 2.1: Social and Related Risk Factor Study Variables

Risk Factor	Beneficiary-Level Variable	Provider-Level Variable	Strengths	Limitations
Income	Dually-enrolled status	Top quintile of proportion dually enrolled in Medicare and Medicaid, or alternatively of SSI or Disproportionate Share Index (where available)	Easily available, widely used, good face validity	Binary, requires Medicaid enrollment rather than just eligibility
Income	Zip Code Tabulation Area (ZCTA)-level income: Lowest Quintile	Lowest quintile of median ZCTA-level income within the Hospital Service Area or equivalent	Not dependent on beneficiary application for or enrollment in special programs	Imprecise estimator of individual income
Race/ ethnicity	RTI recode of Medicare race/ ethnicity variable	High-Black hospital defined as top quintile of proportion Black, High-Hispanic hospital defined as top quintile of proportion Hispanic	Improves identification of racial and ethnic minorities over Medicare race/ ethnicity code contained in claims data	Does not allow for multiple categories, remains a problem to identify some racial and ethnic groups Includes a limited number of race and ethnicity codes
Rurality	Home ZIP code outside Metropolitan Statistical Area*	Provider's billing ZIP code not in a Metropolitan Statistical Area*	Easily available, corresponds to Medicare payment policy	Dichotomous, so does not capture degrees of rurality
Disability	Original Reason for Medicare Entitlement	Top quintile of proportion of beneficiaries with disabilities	Easily available, currently used in Medicare Advantage payments	Requires application and enrollment, does not capture those who acquire a disability after age 65

RTI=Research Triangle Institute

*For post-acute care, rural was defined as outside both Metropolitan and Micropolitan Statistical Areas, in keeping with Medicare payment rules. For home health, rurality is based on the beneficiary's ZIP code rather than the agency's ZIP code, which is how Medicare determines rurality for this program. For the Medicare Shared Savings Program, since hospitals and providers may be geographically dispersed, "rural" ACOs were considered to be those with the highest proportion of rural beneficiaries.

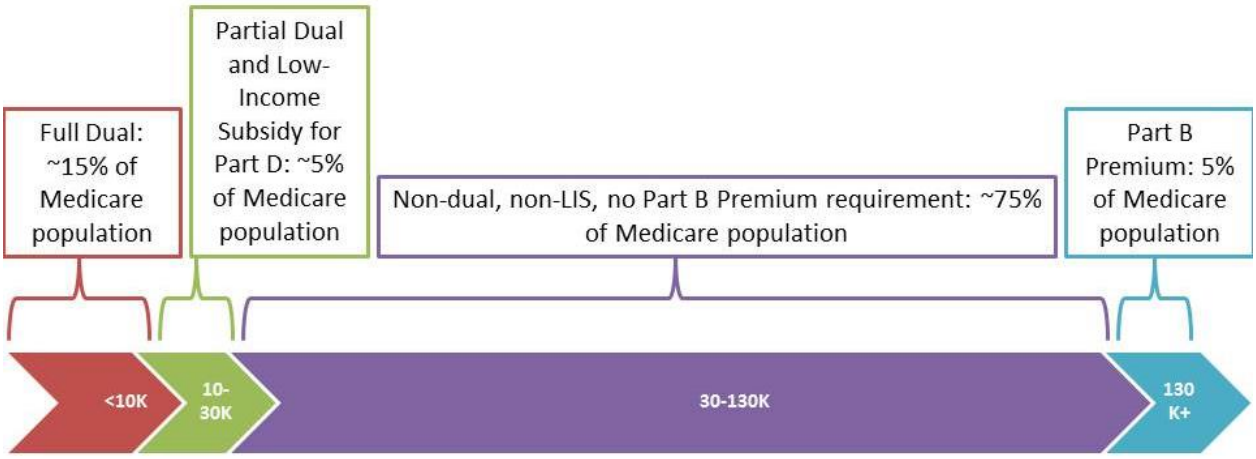
A. Income

Definitions and Limitations of Available Data

The first social risk factor variable relevant to this study is income. However, because eligibility for and receipt of Medicare services is not related to income, the Medicare program does not routinely collect detailed income information about beneficiaries. This is in contrast to other programs, such as Medicaid and the federal Supplemental Security Income (SSI) program, that determine eligibility in part by income and thus require the government to collect income data as part of the enrollment process. Thus, the best available data may be collected by another program and then reported in the existing Medicare data.

Figure 2.1 summarizes the beneficiary-level income data used in Study A, and demonstrates that the available information is largely in the tails of the income distribution; each component is described in the paragraphs that follow:

Figure 2.1: Individual-level Income Data in Medicare



1. Defining Income using SSI Enrollment

The IMPACT Act mentions use of federal SSI enrollment data, and that data might be ideal for evaluating poverty, since SSI eligibility relies on a federal standard. To be eligible for SSI, an individual must be aged 65 or over, blind, or disabled, and have limited income, limited resources, and meet certain citizenship and residency requirements. SSI is scaled, such that the more income an individual has (up to the Federal Benefit Rate (FBR)), the lower the SSI benefit will be. The FBR was $733 per month for individuals in 2015. Unfortunately, beneficiary SSI receipt is not contained in existing Medicare data. This variable is held by the Social Security Administration (SSA) and is not released to CMS or to researchers except for the express purpose of determining hospital disproportionate share payments. Thus, it is not currently available for individual-level analyses. An aggregate proxy at the hospital level is available, the proportion of beneficiaries at a hospital who receive SSI, and this is used in hospital-level analyses where appropriate.

2. Defining Income using Medicaid Enrollment

One way to identify individual income in Medicare administrative data is by identifying those Medicare beneficiaries who are also enrolled in Medicaid, often referred to as “dually enrolled.” Dual enrollees make up a significant proportion of the Medicare population: roughly one in five Medicare beneficiaries

is dually enrolled. In 2013, there were 10.7 million dual enrollees nationally, of which 7.7 million (72%) had full Medicaid benefits.[63] About two-thirds of dual eligible beneficiaries are over the age of 65, while about a third are younger individuals with disabilities.[64]

Though Medicaid eligibility is defined on a state-by-state basis, it varies much less across states for the over-65 and disabled populations that are the focus of this Report. For over-65 and disabled populations in 40 states plus the District of Columbia, Medicaid eligibility in the Medicare population is connected to receipt of SSI, which sets an income standard for eligibility at roughly 75% of the Federal Poverty Level (FPL).[d] However, about one third of states set their eligibility levels at 100% FPL or higher. There are also ten states, known as 209(b) states, in which eligibility rules for dually eligible populations can be set lower than the SSI standards.[e]

Additionally, there are different types of dual eligibility based on income and assets, and these also vary somewhat by state. "Full dually-enrolled beneficiaries" fall under the lowest income and asset cutoffs, and receive both full Medicare benefits and full Medicaid benefits. "Partial dually-enrolled beneficiaries," with slightly higher income and assets, receive only certain components of the Medicaid benefit package. For example, partial dually-enrolled beneficiaries may receive assistance only with premiums for the Part B Medicare benefit, or only with cost sharing for Medicare benefits.[65] In 2013, 28% of dually-enrolled beneficiaries were in one of the partial coverage categories.[63] Appendix 2.A provides a full list of the categories of dual eligibility and state requirements for each.

Medicare data captures Medicaid enrollment with a variable labeled "state reported dual eligible status code." This code, captured monthly, indicates which of the individual categories of dual eligibility apply to the beneficiary.

Using dual enrollment as an income proxy has several limitations. One is its variability by state, though, again, this is much less of an issue for the over-65 and disabled populations that constitute the dually-enrolled population in Medicare. A second important limitation is that dual enrollment only captures individuals who are actually enrolled in Medicaid and misses low-income beneficiaries who have not applied for Medicaid, or who are not aware they are eligible for income assistance. Medicaid enrollment also fails to identify the "near-poor" who may face similar challenges as Medicaid recipients but who lack the additional support that Medicaid provides. Finally, dual enrollment is a binary variable, and does not offer information about the actual income or assets of individuals, but rather only indicates that they fall below Medicaid eligibility thresholds.

3. Defining Income using Low-Income Subsidy Enrollment

A second way to identify individual income in Medicare data is to identify Medicare beneficiaries who are eligible for low-income subsidies (LIS) for purchasing prescription drugs through Medicare Part D.

[d] SSI uses the Federal Benefit Rate (FBR), while Medicaid uses the Federal Poverty Level; the current FBR to qualify for SSI is roughly 75% of the FPL.

[e] SSI was created by the amendments of 1972 and became effective in 1974. Section 209(b) of that Act allowed states to apply 1972 eligibility criteria to aged or disabled individuals receiving SSI benefits for purposes of determining Medicaid eligibility (https://www.govtrack.us/congress/bills/92/hr1/text).

This program applies to beneficiaries with incomes up to 150% of the FPL and has higher asset limits than SSI. The LIS program provides assistance on a sliding scale with premiums and copays for prescription drug coverage. Because the income standard for the low-income subsidy is federal, it has the advantage of being uniform across states. It also captures a slightly higher-income group than dual enrollment alone based on its eligibility criteria.

A limitation to using LIS as a marker for poverty is that LIS enrollment data are only available in Medicare administrative datasets for beneficiaries who are enrolled in Medicare Part D. As of 2013, there were 37 million such Medicare beneficiaries, representing about two-thirds of all Medicare beneficiaries. However, state enrollment in Part D varies from 40% of beneficiaries in Alaska to 75% in California. Participation in Part D also varies by enrollment in Medicare Advantage, with the vast majority of Medicare Advantage enrollees also participating in a Part D plan, but only about half of fee-for-service beneficiaries enrolled in Part D.[66] Finally, prior research has shown that individuals with low incomes,[67] as well as those with cognitive limitations and low numeracy,[68,69] are less likely to enroll in Part D, suggesting that the Part D population may not be representative of the broader Medicare population, particularly among those groups who are socially at-risk.

4. Defining Income using the Part B Income-Related Premium

One additional measure identifies beneficiaries with high incomes. This is the Part B (and, for those who participate, Part D) income-related premium. Currently, Medicare beneficiaries pay a monthly premium for Part B coverage that is generally equal to 25 percent of the average monthly per-capita Part B expenditures;[70] in 2016 this was about $122 per month.[71] However, beneficiaries with higher incomes (more than $85,000 per year for individuals and more than $170,000 per year for couples filing their taxes jointly) are required to pay higher rates. These higher rates affected roughly 5 percent of Medicare beneficiaries, and range from 35 percent to 80 percent of average per-capita costs, or $170.50 to $389.80 monthly in 2016. As a result of changes contained in the Medicare Access and CHIP Reauthorization Act of 2015 (MACRA), in 2018, the contributions for individuals with incomes above $133,500 (or couples above $267,000) will increase further. These data are based on tax filings rather than applications for a particular program. However, they only identify the top 5 percent of Medicare beneficiaries in terms of income. For this work, therefore, the income-related premium variable was considered in exploratory analyses only.

5. Defining Income Using Geographic Indicators

A final potential source of data for income is not beneficiary-level data but rather data that pertain to a beneficiary's area of residence. While this source of data is not specifically mentioned in the IMPACT Act, geography-based income data was examined as part of this project in exploratory analyses.

The American Community Survey (ACS) includes U.S. Census data on local income and can be linked with Medicare data to provide geography-based income estimates for Medicare beneficiaries. The ACS samples about 3.5 million housing units each year. Single-year estimates are released for areas with populations of 65,000 or above; three-year estimates are released for areas with populations of 20,000 or above; and five-year estimates are released with no minimum population threshold. The smallest geographic census units are the 11 million Census Blocks, for which no data are released. However, the

Census Bureau does release five-year ACS data for the increasingly larger geographic areas of "Block Groups" (roughly 1,500 individuals per group), "Census Tracts" (roughly 4,000 individuals per group), and "ZIP Code Tabulation Areas (ZCTAs)" (roughly 10,000 individuals per group). Block Group and Census Tract data are technically difficult to use when street addresses must be matched to these geographic entities. However, variables available at the ZCTA level, which are available with Medicare claims, include median income, poverty rate, SSI rate, dual enrollment rate, rate of receipt of Supplemental Nutrition Assistance Program (SNAP), Medicaid enrollment rate, and information on educational attainment. These data can be used as proxies for an individual's SES, or as a measure of neighborhood effects that may be important in themselves.

The major limitation of geography-based income data is that a median income may not adequately reflect any given individual in that area; an area in Manhattan, for example, with both extremely wealthy and extremely poor individuals might have a modest median income, which would create a significant misclassification.

6. Variables Chosen and Rationale

As discussed above, no single existing income variable in Medicare data provides precise information on beneficiaries' income. Therefore, this study uses multiple measures of income, recognizing that the strengths of each may offset the limitations of the others. The analyses in this report focus on dual eligibility because of its availability for all Medicare beneficiaries and on LIS where available, for analyses on Medicare Advantage and Part D. In exploratory analyses, median ZCTA income along with other ZCTA-level variables, as well as the high-income indicator, were considered. The second, forthcoming study mandated by the IMPACT Act, referenced as "Study B" in Chapter 1, will address alternative metrics of income currently unavailable in the Medicare program that may provide more precise estimates of this important factor.

At the provider level, being in the highest quintile of the proportion of beneficiaries who were dually enrolled was generally used to categorize what were referred to as "high-dual" providers. For example, physician practices in the highest quintile of the proportion of assigned beneficiaries who were dually enrolled (full or partial) were referred to as "high-dual practices;" the dialysis facilities with the highest proportion of dually enrolled beneficiaries were referred to as "high-dual facilities," and so on. However, for hospital analyses, since the Disproportionate Share Hospital (DSH) Index is widely used and accepted as a way in which to define safety-net hospitals, the top quintile of DSH Index was used to identify the hospital group of particular interest. One important caveat is that "safety-net hospitals" are defined many different ways by different researchers, so in some cases, if results in this report do not align with other reports on safety-net hospitals, it may be due to differential classification of the safety net.

B. Race and Ethnicity

Definitions and Limitations of Available Data

Two variables designating the race and ethnicity of Medicare beneficiaries are available in Medicare's primary administrative dataset, the Master Beneficiary Summary File (MBSF). Rather than obtaining

these variables from beneficiaries, the Medicare program obtains these variables indirectly. The first race variable, the Beneficiary Race Code, is obtained from the SSA, which transfers demographic data on applications for Social Security Numbers (SSNs) to the MBSF. The second variable is derived using an algorithm developed by the Research Triangle Institute (RTI).

1. Defining Race and Ethnicity Using SSA Data

Over time, the race and ethnicity data collected by the SSA and transferred to the Medicare program have changed. From its inception through 1980, SSA collected race information by asking SSN applicants to identify voluntarily with one of only three categories (White, Black, and Other); applicants who selected none of the three categories were assigned a race of Unknown. In 1980, in response to guidance from the Office of Management and Budget,[72] the race and ethnicity categories were expanded to 1) White, non-Hispanic; 2) Black, non-Hispanic; 3) Asian, Asian American, or Pacific Islander, non-Hispanic; 4) Hispanic; or 5) American Indian or Alaska Native, non-Hispanic. Applicants were still asked to choose only one category. The category of Other was eliminated, while Unknown was still applied to applicants who made no selection. The SSA has never allowed SSN applicants to specify both a race and an ethnicity, nor does it allow for individuals to be identified as more than one race and/or a separate race and ethnicity. Additional limitations include the fact that the MBSF does not identify Asian and Pacific Islander beneficiaries separately. Furthermore, the SSA has been assigning SSNs at birth rather than waiting for voluntary SSN application (generally for employment) since 1989. Because birth certificates may not contain race and ethnicity data (this varies by state), some enrollees in more recent years do not have any race and ethnicity data from SSA.[73]

These limitations inherent to SSA's historical data collection methods in turn limit Medicare's data on race and ethnicity, despite numerous efforts by CMS to improve the administrative database in past decades.[74] While the Beneficiary Race Code is highly accurate for White and Black beneficiaries compared to the gold standard of self-report identified by the Institute of Medicine,[75](with sensitivities of 97% and 95%, respectively) it is only moderately accurate in identifying Hispanic, Asian and Pacific Islander, and American Indian and Alaska Native beneficiaries, with sensitivities of 39%, 58%, and 11%, respectively.[76-80]

2. Defining Race / Ethnicity Using Imputed Data

Given the limitations of SSA data, and in the absence of self-reported race and ethnicity data, researchers have developed additional indirect methods to estimate or "impute" Medicare beneficiary race and ethnicity. One such indirect approach, developed by RTI, assigns an updated race and ethnicity using beneficiary surname, first name, language preference, and existing Medicare Beneficiary Race Code.[76] This RTI method is more sensitive for identifying Hispanic and Asian and Pacific Islander beneficiaries than the Beneficiary Race Code (sensitivities of 77% and 79%, respectively), and maintains similarly high performance in identifying White and Black beneficiaries. The RTI imputation algorithm creates an additional race and ethnicity variable, the "Research Triangle Institute (RTI) Race Code," currently included in the Medicare administrative record.

The RTI method is limited in that that it was not designed to improve identification of beneficiaries who identify as American Indians/Alaska Natives, so that population remains under-identified. In addition,

the method does not identify Asian and Pacific Islander beneficiaries separately, nor does it allow for individuals to be identified as more than one race and/or a separate race and ethnicity.

3. Defining Race / Ethnicity Using Other Sources of Data

While several other initiatives within the Medicare program collect race and ethnicity data, they only do so for samples or targeted subgroups of beneficiaries. For example, the Medicare Current Beneficiary Survey obtains detailed, self-reported information on race and ethnicity from respondents, but only for a sample (currently about 15,000 beneficiaries annually) of the Medicare population.[81] Similarly, while certain assessment tools for Medicare post-acute care settings also include race and ethnicity items, this information is available only for the subset of Medicare beneficiaries who use these services, and the data are not stored in the MBSF file.

In the future, race and ethnicity data may be available from other sources, including electronic health records (EHRs). The Office of the National Coordinator, in the finalized 2015 Certification Rule, includes granular capture of race and ethnicity as a criterion for Health IT; data standards for this data capture are compliant with the OMB standards discussed above as well as with Centers for Disease Control (CDC) race and ethnicity data standards. The criterion also requires a Health IT module to be able to record multiple races and/or ethnicities for a patient (see https://www.healthit.gov/policy-researchers-implementers/2015-edition-final-rule).

4. Variables Chosen and Rationale

The RTI Race Code improves substantially upon the Beneficiary Race Code in identifying Hispanic and Asian and Pacific Islander beneficiaries, and maintains similar performance in identifying White and Black beneficiaries. Currently, there is no alternative variable in existing Medicare data that: 1) better identifies American Indian and Alaska Native beneficiaries, 2) separates out Asian and Pacific Islander populations, and/or 3) allows beneficiaries to be identified with more than one race or a race and an ethnicity. In the absence of such a variable, which would improve upon the weaknesses of both the Beneficiary Race Code and the RTI Race Code, the RTI Race Code is used for the analyses in this report. However, future analyses, included those conducted under Study B, may explore more granular data from alternative data sources where available.

For providers, those in the highest quintile of the proportion of beneficiaries who were Black or Hispanic were referred to as high-Black or high-Hispanic, respectively. However, it is worth noting that since the population prevalence of these racial and ethnic groups is relatively low, a “high-Hispanic” provider might still only have a beneficiary mix of 15% Hispanic beneficiaries in some cases. Therefore, these provider classifications should be interpreted in light of the population prevalence of the beneficiary groups in question.

C. Community Factors, including Rurality

Definitions and Limitations of Available Data

Another important community variable that can serve as a proxy for individual social risk, and to quantify local resources, stressors, and supports, is rurality. Many Medicare payments, including those made for acute, post-acute, dialysis, and ambulance services, are adjusted in some way for rurality,

which, for the purposes of Medicare payments, is commonly assigned using a beneficiary or provider's geographic location (address).

1. Defining Rurality Using Core-Based Statistical Areas (CBSAs)

For most Medicare classifications that identify rural areas, CMS uses a concept developed by the Office of Management and Budget (OMB), Core-Based Statistical Areas (CBSAs).[82] CBSAs are county-based areas consisting of an urban core and adjacent areas that are economically tied to that core by commuting. They have three major classifications: Metropolitan Statistical Area (MSA), Micropolitan Statistical Area (mSA), or Neither. An MSA contains an urban core population of 50,000 or more, while an mSA contains an urban core population of at least 10,000 but less than 50,000. An area without a core population of at least 10,000 is considered neither Metropolitan nor Micropolitan.

For most Medicare payment purposes, all counties that are not part of an MSA are considered rural, so that counties classified as either Micropolitan or Neither are considered rural. Under these definitions, there are 381 MSA and 536 mSAs currently in the U.S.; about 15% of the overall U.S. population and 72% of the land area of the country is in non-metropolitan, or rural, counties.[83] In the post-acute setting, only Neither is considered to be rural for payment purposes.

One important limitation to this method is that the use of a county-based method like the CBSA may obscure important differences within counties, particularly large ones that include many different areas. Because counties that include both rural and urban areas are classified as urban if they include a core urban area, some areas within counties may end up with counterintuitive classifications. An example is San Bernardino County, CA, which includes both the outskirts of the city of Los Angeles as well as Death Valley, but is still classified as urban.[84]

2. Defining Rurality Using Alternative Methods

The Federal Office of Rural Health Policy (FORHP) in the Health Resources and Services Administration (HRSA) has developed an additional method that is commonly used when studying Medicare beneficiaries and providers. This method begins by defining all non-MSA counties as rural, but then applies additional parameters to reclassify rural areas within Metropolitan counties based on Rural-Urban Commuting Area (RUCA) codes developed by the U.S. Department of Agriculture (USDA).[83] While this method allows for more granular identification of rural providers and beneficiaries, it is not currently used by CMS for most payment purposes, with the exception of Critical Access Hospital determination and telehealth billing. Analyses of rurality beyond what CMS currently uses will be pursued in Study B.

3. Variables Chosen and Rationale

Because CMS follows OMB guidance to adjust payments to individual providers, clinics, and hospitals, the CBSA methodology is most applicable for the analyses conducted for this Report. However, granular data on rurality may be important to explore, and will therefore be included in Study B.

At the provider level, where a provider had an address (for example, a hospital or skilled nursing facility), the address was used to assign the provider rural or urban status. However, for providers that are geographically dispersed (for example, an ACO or a Medicare Advantage health plan), the providers in

the top quintile of the proportion of assigned beneficiaries who were considered rural were classified as rural providers.

A separate set of work has been undertaken to examine rural providers that are ineligible for the Medicare payment programs included in this report because they are paid under unique mechanisms. For example, Critical Access Hospitals are statutorily excluded from the Hospital Readmissions Reduction Program, Hospital Value-Based Purchasing, and the Hospital-Acquired Conditions Reduction Program because they are not paid under the Inpatient Prospective Payment System, on which these programs are based. Analysis of these providers is outside the scope of this Report but complementary to its findings; please see the ASPE brief entitled "Rural Hospital Participation and Performance in Federal Health Care Delivery System Reform Initiatives" for further information.[85]

D. Disability

Definitions and Limitations of Available Data

As noted above, while this study did not classify disability as a social risk factor, disability was included in study analyses across programs because of its close linkage to potentially unmeasured social risk factors, availability in the Medicare claims data, and current use in Medicare programs.

1. Defining Disability Using Original Reason for Medicare Entitlement

Section 223(d) of the Social Security Act defines disability as the "(A) inability to engage in any substantial gainful activity by reason of any medically determinable physical or mental impairment which can be expected to result in death or which has lasted or can be expected to last for a continuous period of not less than 12 months; or (B) in the case of an individual who has attained the age of 55 and is blind (within the meaning of "blindness" as defined in section 216(i)(1)), inability by reason of such blindness to engage in substantial gainful activity requiring skills or abilities comparable to those of any gainful activity in which he has previously engaged with some regularity and over a substantial period of time." If these criteria are met, individuals may be eligible for Social Security Disability Insurance (SSDI).

Individuals younger than 65 who have received SSDI payments for 25 months are entitled to Medicare Part A and are eligible for Part B the month their disability benefits begin. Individuals younger than 65 who have been diagnosed with amyotrophic lateral sclerosis (ALS) are entitled to Medicare Part A and are eligible for Part B the month their disability benefits begin. Individuals younger than 65 who are undergoing dialysis for end-stage renal disease (ESRD) generally receive Medicare Part A and Part B on the first day of the fourth month of dialysis treatments, with a few exceptions. The original reason for an individual's Medicare entitlement can be found in the variable "Original Reason for Entitlement Code" (OREC) in the Master Beneficiary Summary File. At the age of 65, those with OREC indicating disability retain this code, though their current Medicare status code (MS_CD) changes from Disabled (with or without ESRD) to Aged (with or without ESRD).

Using the OREC variable to identify disability has certain limitations. Because individuals must apply for and receive this designation, for example, the data do not capture individuals who have a disability but

did not seek formal designation as such. In addition, the OREC does not identify beneficiaries who acquire a disability after Medicare enrollment at age 65.

2. Defining Disability Using Alternative Methods

The limitations noted above have sparked efforts to create algorithms using claims data to identify individuals with a high probability of having a disability. The recent ASPE/Mathematica issue brief entitled "Identifying Medicare Beneficiaries with Disabilities: Improving on Claims-Based Algorithms" provides an introduction to this issue.[86] These algorithms are beyond the scope of this first report, but may be important to explore in future work.

3. Variables Chosen and Rationale

This study selected the OREC variable to identify individuals as having a disability because it is valid, complete, and available in enrollment data and thus uniformly usable across programs. In addition, this variable has been used previously in Medicare payment policy.

At the provider level, those in the highest quintile of the proportion of beneficiaries who had originally qualified for Medicare based on a disability were considered "high-disabled" providers.

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CHAPTER 3: Statistical Methods

I. Study Overview and Research Questions

This Report quantifies the underlying relationships between social risk factors and the patient-level measures contained in the Medicare payment programs. It also examines the performance of providers that serve beneficiaries with social risk factors under specific programs. (Note that here the term "providers" is used to indicate physicians, hospitals, dialysis facilities, nursing facilities, Medicare Advantage contracts, etc.) In addition, this Report outlines policy options that could potentially address social risk factors, and quantifies the impact of these options on providers serving beneficiaries with social risk factors.

Analyses were structured around three research questions, as shown in Table 3.1:

Table 3.1: Research Questions

1. A. Is there a relationship between social risk factors and performance on the metrics that comprise the Medicare payment programs, above and beyond current adjustments? B. If so, is this primarily related to patient factors, or due to differences in the quality of the providers from which beneficiaries with social risk factors seek care?
• Example: Are dually-enrolled beneficiaries more likely to be readmitted after a hospitalization for congestive heart failure? If so, is this primarily related to a patient's dual enrollment, or is this because dually-enrolled beneficiaries are discharged from hospitals that tend to have higher readmission rates?
• Example: Are rural beneficiaries with chronic obstructive pulmonary disease more likely to have higher annual costs of care? If so, is this primarily related to where beneficiaries live, or is this because physician practices that care for rural beneficiaries tend to have higher costs for beneficiaries with this condition in general?
2. Is the Medicare payment program in question more likely to penalize providers with a high share of beneficiaries with social risk factors?
• Example: Under the Hospital Readmission Reduction Program, are safety-net hospitals more likely to receive a penalty than non-safety-net hospitals?
• Example: Are physician practices with a higher proportion of Hispanic beneficiaries more likely to receive a downward payment adjustment in the Physician Value-based payment modifier Program?
3. How would different policy options change the way providers are impacted by the Medicare payment program in question?
• Example: If the Hospital Readmission Reduction Program assigned penalties within tiers of the disproportionate share index instead of across all hospitals, would this change the financial impact on safety-net hospitals?
• Example: If the Physician Value-based payment modifier adjusted quality and cost metrics for dual enrollment, would physician practices with a high proportion of dually-enrolled

beneficiaries be penalized less often?

The intent in following this consistent framework across each of the programs was to develop a large and clear body of evidence that would inform conclusions and considerations within each of the programs, and also allow conclusions to be drawn across programs. The results presented in the following chapters are structured according to these main questions for each program. Although metrics, and, in some cases, data sources differ, the same approach was used to study the effect of social risk within each Medicare payment program.

II. Statistical Approach, by Research Question

1. A. Is there a relationship between social risk factors and performance on the metrics that comprise the Medicare payment programs, above and beyond current adjustments? B. If so, is this primarily related to patient factors, or to differences in the quality of the providers from which beneficiaries with social risk factors seek care?

Raw performance on claims-based measures (readmissions, admissions, costs, etc.) was first calculated for beneficiaries having the social risk factor of interest versus beneficiaries not having the risk factor (e.g., dually-enrolled versus non-dually-enrolled). For binary outcomes, regression models were then developed to estimate the total (within- and between-provider) odds of the particular outcome for beneficiaries with versus without the social risk factor. "Within-provider" differences are those differences in quality or outcomes that are evident between two beneficiaries within the same provider—for example, between dual and non-dual beneficiaries at the same hospital. In contrast, "between-provider" differences are those differences in quality or outcomes between two beneficiaries cared for by different providers—for example, between beneficiaries at hospital A versus hospital B. Between-provider differences may represent differences related to the quality of a provider's performance or to unmeasured differences in patient population or to differences in the health care environments of the providers.

Each model included risk adjustment based on CMS specifications for each particular measure, where applicable (i.e., risk-standardization for readmissions and age/sex adjustment for preventable admissions). Models were built using generalized estimating equations (GEE) with an independent correlation matrix, such that the differences found reflected the total differences between beneficiaries with social risk factors and their non-at-risk peers (question 1A). These models were repeated for each of the patient-level social risk factors of interest.

Question 1B asks whether beneficiaries with social risk factors do more poorly even within the same provider. A provider random effect was thus added to the models described above, to isolate the within-provider differences in outcomes. In each case, a term for the proportion of beneficiaries with social risk factors served by each provider was also added, to control for residual confounding by provider.

Additionally, analyses were conducted to quantify the effect of receiving care from a provider serving a high proportion of beneficiaries with social risk factors, as outlined in Chapter 2. For most programs, these providers are the ones in the highest 20% of each social risk factor, with the exceptions noted in

Chapter 2. Models were re-run at the patient level with a random effect for provider, but this time the primary predictor was the provider type (e.g., high-dual hospital, or rural dialysis facility) as the primary predictor; these models yield the total effect of being cared for by a particular type of provider, which includes both the effects of the patient population as well as the effect of the provider type.

Finally, models including both patient-level and provider-level social risk as predictors were run. These models included, for example, whether beneficiaries were dually-enrolled and whether they were discharged from a high-dual hospital in the same model. These analyses separate the independent contribution of patient from provider factors to performance.

The next set of analyses focused on determining the consistency of the relationship between social risk factors and outcomes across providers – for example, determining the consistency of the difference in readmission rates between dually-enrolled and non-dually-enrolled beneficiaries across hospitals. This analysis can yield information about whether the gap can be reduced or eliminated. For example, a highly variable difference between dually-enrolled beneficiaries and non-dually-enrolled beneficiaries across hospitals might suggest that some institutions had been able to effectively close the gap, and therefore other hospitals may learn to do so as well. On the other hand, more consistency across hospitals might suggest that the relationship between dual enrollment and readmissions was a more innate one and less easily remedied.

To determine the consistency of relationships, the random effects models from question 1A above were re-run with the CMS risk adjustment for each measure, but this time including an additional random effect for the social risk factor of interest. Rather than calculating the average within-hospital difference between dual and non-dual, these models estimate the difference between dually-enrolled and non-dually-enrolled at each individual hospital. These hospital-level differences were then plotted using box and whisker plots.

2. Does the Medicare payment program in question disproportionately penalize providers or plans that serve beneficiaries with social risk factors?

Next, analyses were run to determine whether providers with a high share of beneficiaries with social risk factors were more likely to perform poorly under specific payment programs. These analyses were important because of the processes by which performance is translated to payment in each program. Because of these processes, even if providers serving beneficiaries with social risk factors do more poorly on the individual measures examined in the prior analyses, it is conceivable that they could do relatively well on a program overall. In the Hospital Value-Based Purchasing program, for example, hospitals receive an achievement score and an improvement score for each measure, with the higher of the two becoming their final score. Thus, a hospital with a high overall score may have received this score due either to high levels of achievement or high levels of improvement. As a result, providers with poor absolute performance which are improving quickly may still do well under the program.

In contrast to the prior set of analyses, which were focused on understanding underlying relationships at the patient level, these analyses were all conducted at the provider level. For each program,

performance and scoring were examined for providers that served a high proportion of high social risk beneficiaries, using the same groupings as above (high-dual, rural, etc.). Linear regression models were used, or, in some cases, median regression due to small sample size and non-normal performance data. Performance was first compared on individual measures (e.g. mortality for congestive heart failure), then on domains (e.g., clinical outcomes), and then on total performance score for each program.

Finally, the "bottom line" financial impact of the program was examined. This was different for each program, but in every case represented the final financial impact of the program in question. Examples include the penalty for excess readmissions for the Hospital Readmissions Reduction Program, the Value-Based Incentive Payment Adjustment Factor for Hospital Value-Based Purchasing, or the amount of shared savings generated by an ACO under the Medicare Shared Savings Program. In each case, performance for each provider group of interest was assessed.

Where appropriate, additional analyses adjusting for structural characteristics of the provider or plan were conducted to identify, for example, whether differences in performance for high-dual hospitals were driven by hospital size, or whether differences in performance for rural physician practices were driven by specialty composition.

3. How would different policy options change the way providers are impacted by the Medicare payment program?

This third set of analyses were designed to help policymakers understand how various proposed changes to Medicare payment programs might change the way programs impact providers serving beneficiaries with social risk factors.

This Report's policy simulations focused primarily on dual enrollment status, as this was the dominant social risk factor in the majority of the analyses performed. Adjustments for race and ethnicity were not modeled because although race and ethnicity have been associated with performance in prior analyses, the magnitude of these relationships is often shown to decline significantly after accounting for poverty and other social factors.

Adjustments for rurality were also not modeled, but for different reasons. First, analyses demonstrated mixed relationships between rurality and performance—i.e., rural providers were as likely to do well as to do poorly. Second, since so many of the relevant rural providers are either statutorily excluded from the programs in this report due to their unique payment arrangements, or practically excluded because of their small sample size, the policy options to address rural delivery system reform more broadly are outside the scope of the programs included here. See the recent ASPE Issue Brief entitled "Rural Hospital Participation and Performance in Federal Health Care Delivery System Reform Initiatives"[1] for further information.

Across Medicare programs, the first option was the status quo. As noted in Chapter 1, four main policy strategies were then tested: A) adjustment for patient-level social risk factors; B) stratification, or

tiering, of providers by social risk; C) rewarding improvement (if not already contained in the program); and D) providing additional bonuses for high performance for beneficiaries with social risk factors. The details of how each option was applied are provided in the program chapters.

For each policy option, the impact was calculated by repeating the "bottom line" calculation under the new scenario, and then calculating the difference between the status quo and the policy option for the groups of interest. For the Hospital Readmission Reduction Program, for example, penalties for individual hospitals were calculated with and without adjustment for dual enrollment, and the penalties for safety-net versus non-safety-net hospitals were compared under the status quo versus the adjusted option.

When applicable, additional program-specific factors were also considered in evaluating policy options. For example, the Hospital Acquired Conditions Reduction Program currently uses a decile-based scoring system; going to a continuous scale as CMS has proposed, while not directly related to social risk per se, could have important ramifications for providers serving high-risk populations. These program-specific simulations are also outlined in the program chapters.

III. References

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CHAPTER 4: Best Practices for Achieving Good Outcomes in Socially At-Risk Beneficiaries

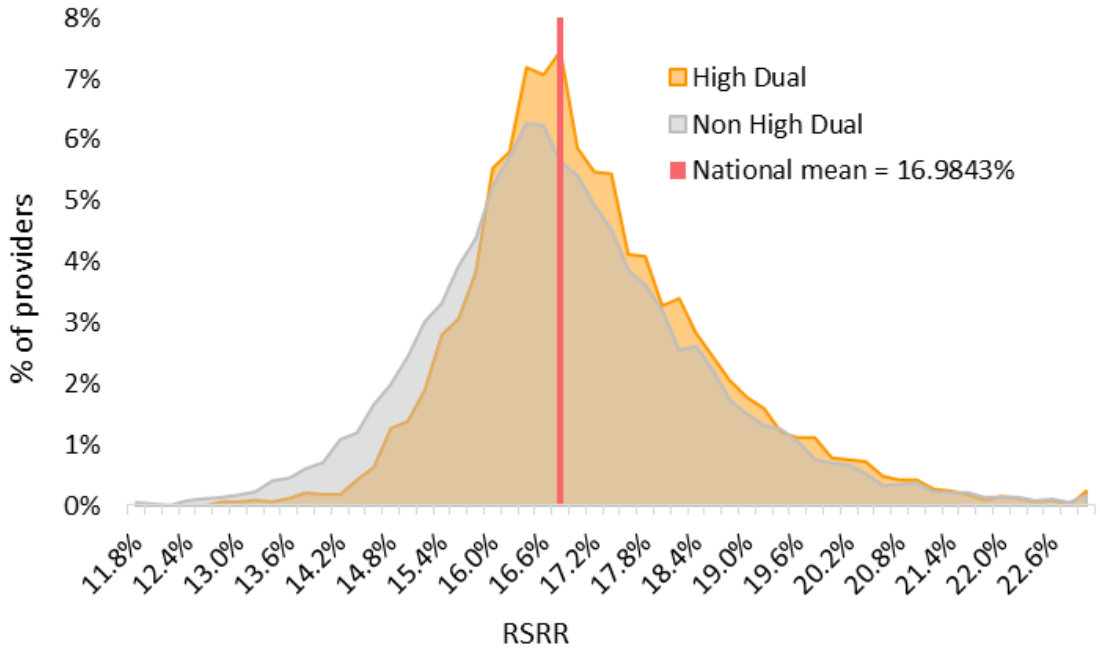
The charge to ASPE in the IMPACT Act was to determine the relationship between social risk and performance on quality and resource use measures under Medicare payment programs. While analyses did reveal significant relationships at the patient level in this regard, analyses also revealed that, in every care setting and every program, there were providers that were able to achieve high performance despite serving a highly at-risk population.

This finding suggested that the Report would not be complete without an explicit focus on this issue. In theory, the best way to reduce the disproportionate burden of Medicare's value-based purchasing programs on safety-net providers would be to improve care and outcomes at these hospitals and practices – thus simultaneously helping Medicare beneficiaries with social risk factors and the providers that serve them. In reality, such a task is much easier said than done. However, the intent of this Chapter is to highlight what is currently known about best practices for achieving good outcomes in beneficiaries with social risk factors; implementation considerations based on these principles for each program are included in the program-specific chapters.

I. Variability of Performance for Providers Serving Socially At-Risk Beneficiaries

This Report examines nine Medicare programs currently using value-based purchasing structures. In every program, while on average providers serving beneficiaries with social risk factors performed worse than those who served a less disadvantaged population, the overlap between the groups was significant. Details are shown in each Chapter for the specific programs, but as an example, Figure 4.1 shows the distribution of readmission rates for SNFs in the top quintile by the proportion of their beneficiaries who were dually-enrolled in the study year versus all other SNFs (i.e., those in the bottom 4 quintiles by proportion dually-enrolled). The SNFs with the highest proportion of dually-enrolled beneficiaries, shown in orange, are over-represented on the right side of the red bar, which represents readmission rates that are higher than average. Conversely, the other SNFs, in gray, are over-represented on the left side of the red bar, where the readmission rates are lower than average. However, there are many high-dual SNFs with very low readmission rates, and vice versa.

Figure 4.1: Distribution of Risk-Standardized Readmission Rates (RSRR) for High-Dually-enrolled versus Non-High-Dually-enrolled SNFs



The fact that many high-dual SNFs can perform better-than-average on readmission rates suggests that there may be strategies or techniques that could be used to reduce readmissions at these facilities.

II. National Academies of Sciences, Engineering, and Medicine Report on Best Practices

The National Academies of Sciences, Engineering, and Medicine (NASEM) was contracted by ASPE to provide a report on best practices for beneficiaries with social risk factors to supplement HHS' evaluation of the effect of individuals' social risk factors on quality measures and measures of resource use. The resulting work, "Systems Practices for the Care of Socially At-Risk Populations"[1] is summarized below.

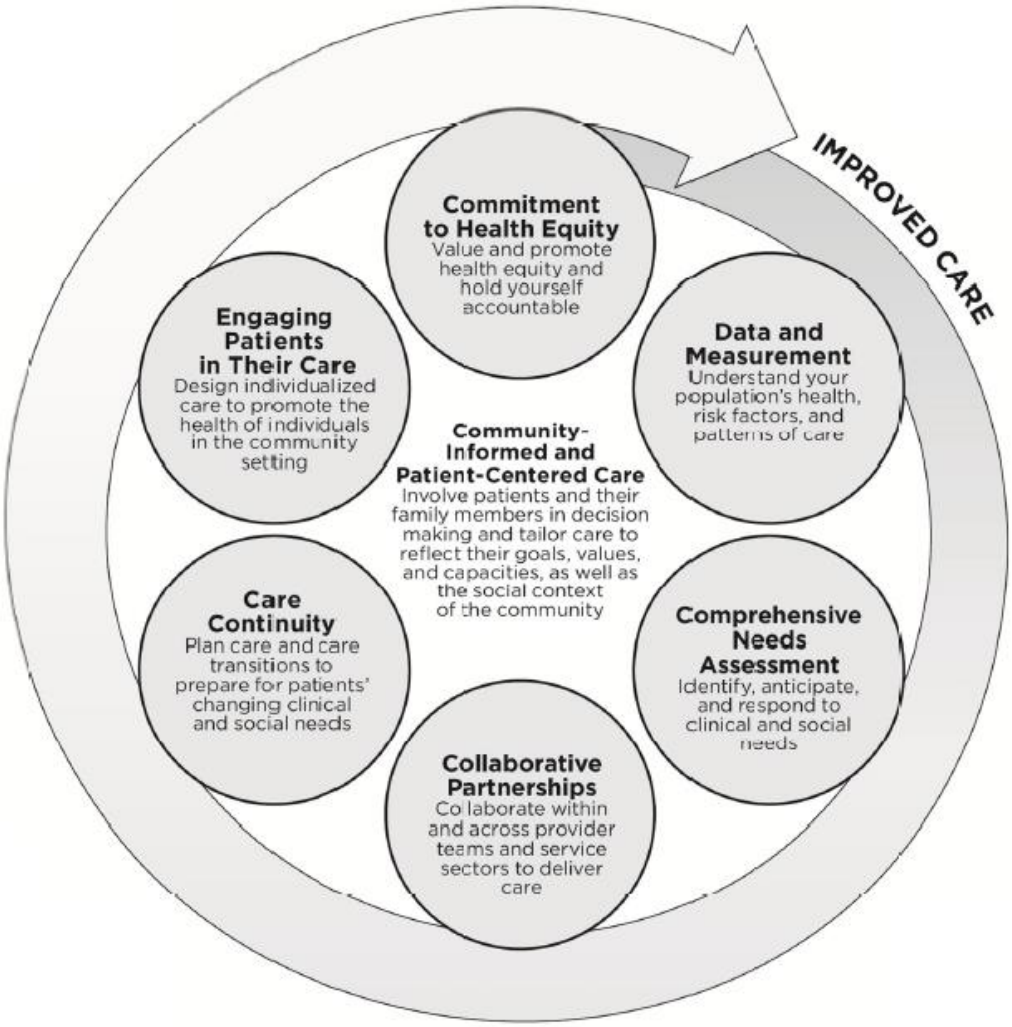
The NASEM identified six systems-level practices that were particularly critical for providers to achieve good care of and outcomes for beneficiaries with social risk factors. These were:

- Commitment to health equity: Value and promote health equity and hold yourself accountable
- Data and measurement: Understand your population's health, risk factors, and patterns of care
- Comprehensive needs assessment: Identify, anticipate, and respond to clinical and social needs
- Collaborative partnerships: Collaborate within and across provider teams and service sectors to deliver care
- Care continuity: Plan care and care transitions to prepare for beneficiaries' changing clinical and social needs

- Engaging beneficiaries in their care: Design individualized care to promote the health of individuals in the community setting

Figure 4.2 shows these in a schematic:

Figure 4.2: Systems Practices



Source: National Academies of Sciences, Engineering, and Medicine. Accounting for Social Risk Factors in Medicare Payment; Systems Practices for the Care of Socially At-Risk Populations. Washington, D.C.: National Academies of Sciences, Engineering, and Medicine; 2016.

The Best Practices identified by the NASEM start with and are organized around providing patient-centered (also called person-centered) and community-informed care. Person-centered care is care which is reflective of individuals' goals and values, involves individuals in decision making, and tailors care to their needs. It considers personal goals, preferences, community and family supports, financial resources, and other areas important to the individual. Community-informed care understands and accounts for community context, including physical and social environments, policies,

resources, and opportunities. Around these two core principles are built the six distinct systems practices:

A. Commitment to Health Equity

Achieving a commitment to health equity means that health care leaders and staff express a core commitment to valuing and promoting principles of health equity, and accept accountability for reducing inequities. Example implementation strategies include creating a culture of equity through leadership; integrating equity into strategic planning; setting up mechanisms to create and reward accountability; and aligning financial and non-financial resources towards promoting health equity. Such a commitment is not necessarily easy; having equity as a stated value in a health system requires leadership and potentially requires changes in overall organizational culture.

B. Data and Measurement

The data and measurement component of improving care for beneficiaries with social risk factors requires that health care providers understand their patterns of performance across different social risk groups, and know how these patterns of performance compare with top-performing peers. Example implementation strategies include collection of data on social risk factors; analysis and monitoring of performance data within risk groups; and having a mechanism to compare this performance with peers. Because beneficiaries with social risk factors tend to be concentrated within a relatively small number of providers (for example, Hispanic beneficiaries are served by a small proportion of Medicare providers overall, due to geographic concentration as well as choices of providers), many providers may be unable to measure disparities with internal data alone (because there would be inadequate sample of either the at-risk or non-at-risk group to calculate disparities in many cases), and instead external benchmarking may be required.

C. Comprehensive Needs Assessment

A comprehensive needs assessment is a mechanism to help providers identify, anticipate, and respond to beneficiaries' clinical, social, and community-based service needs. This is a highly personalized assessment, focused on the unique needs of each provider's patient population, and may include local data analysis, interviews, and/or literature searches. The assessment drives the development of programs and practices that are grounded in evidence, but specific to the particular needs of the provider. Example implementation strategies include the use of health assessment tools by beneficiaries to identify each individual's areas of need, as well as analyses of data at the provider level to assess areas of particular strength or opportunity. Data sharing may be necessary to achieve adequate assessment of needs, particularly for beneficiaries with social risk factors; one example is the creation of an information exchange portal for not only clinical providers, but also social service agencies, public health agencies, and community service organizations and HCBS providers to share data on common customers.

D. Collaborative Partnerships

Collaborative partnerships are relationships developed to match the needs identified in a comprehensive needs assessment on scope, intensity, and scale, as well as areas of focus. These collaborations may include other providers but may also span multiple service sectors, such as housing,

transportation, and nutrition. Some example implementation strategies include the use of multidisciplinary care teams, the creation of medical neighborhoods or accountable health communities, regional collaborations among providers, or collaborations with other agencies and community organizations. As above, as this is a process dependent on the needs of the beneficiaries in question, effective models of collaboration may differ highly from provider to provider and from community to community.

E. Care Continuity

Having care continuity requires that providers anticipate and plan for patient trajectories through illness progression, as well as across sites of clinical care, between different providers and organizations, and as it involves non-clinical and/or community-based settings that support health and health care. Transitions and hand-offs are particularly critical. Example implementation strategies include setting up coordinated care teams, using case managers, care coordinators, or navigators to maintain beneficiary engagement with the primary care team across settings; co-location of clinical and behavioral health services; and the use of new technologies such as the sharing or exchange of priority health data where applicable to achieve these goals.

F. Engaging People in Their Care

Engaging people in their care attempts to maximize their ability to manage their medical conditions and achieve the most independent functioning possible, while providing support where needed. Example implementation strategies include patient education about self-management and healthy behaviors that is culturally sensitive and appropriately tailored to beneficiaries' needs and ability to comprehend materials; using new technologies to promote healthy behaviors and reduce health risks; and working to engage with beneficiaries in community centers, homeless shelters, religious organizations, schools, and other locations to "meet beneficiaries where they are." Again, the specific components of this type of best practice will be very individualized to any given provider and population.

III. Policy Strategies to Enable Best Practices to Caring for Socially At-Risk Beneficiaries

While each of these strategies is intended to be applied at the provider, practice, hospital, or health system level, some of them in particular lend themselves to being addressed by policy. These are therefore included in this report as key considerations. Specific applications to each program are provided in the program chapters (Chapters 5-13) but overarching strategies are as follows:

A. Value and Promote Health Equity

Valuing and promoting health equity can be achieved by creating policies that hold providers accountable for achieving equity and rewarding providers that excel in this area. Specific tactics to address this strategy include the creation of a health equity measure or domain, where feasible, within

existing Medicare value-based purchasing programs, as well as the creation of programs to specifically recognize or reward providers that achieve high quality for beneficiaries with social risk factors.

B. Improve Data and Measurement

Improving data and measurement around social risk factors as well as around patterns of care and outcomes for individuals who are at high social risk can be achieved by creating policies that require data collection that will facilitate these analyses. Specific tactics to address this strategy include enhancing data collection, following uniform structured data capture standards for assessment of social risk, leveraging health IT to improve data capture across care settings, and developing methods to allow analyses stratified by social risk factors.

C. Provide Support for Quality Improvement and Encourage Collaborative Partnerships

Providing support for quality improvement is a crucial component of reducing disparities and reducing the disproportionate burden of Medicare payment policies on the safety net. Performing comprehensive needs assessments, focusing on care continuity, and engaging beneficiaries in their care are all strategies identified by the NASEM for which the details of implementation will vary substantially from provider to provider. These practices, therefore, may be best incented not through detailed policies, but rather through the formation and support of learning collaboratives and other support mechanisms, including the use of health information technology, that can enable providers to create and employ strategies that will best serve their patient populations.

Another potentially important activity that can potentially be promoted through policy is collaborative partnerships and community engagement. Supporting hospitals or health systems with a high proportion of beneficiaries with social risk factors to collaborate with social service agencies and community organizations may have the potentially to significantly improve access to and engagement with health care for beneficiaries who identify as racial and ethnic minorities and those who have low incomes. Practical needs, such as a lack of transportation options, lack of health literacy, difficulty with follow-up, child care needs, etc., are barriers to access and continuation of care, and social service organizations, with greater structural, organizational, and financial support may have the potential to provide critical support to beneficiaries to improve health outcomes and health equity. One current example of such policy-driven change in this area is CMMI's Accountable Health Communities model, which encourages the types of partnerships and community engagement that may lead to lasting change and improved health.

IV. References

1. National Academies of Sciences, Engineering, and Medicine. *Systems Practices for the Care of Socially At-Risk Populations.* Washington, DC: National Academies of Sciences, Engineering, and Medicine;2016.

SECTION 2: Hospital Value-Based Purchasing Programs

Currently, there are three hospital value-based purchasing programs that use financial penalties and rewards to incentivize changes in the quality, outcomes, and costs of health care: the Hospital Readmissions Reduction Program (HRRP) and the Hospital Value-Based Purchasing Program (HVBP), for which payment adjustments began to apply starting in fiscal year (FY) 2013, and the Hospital-Acquired Conditions Reduction Program (HACRP), for which payment adjustments began to apply starting in FY 2015.

Though in this report they are largely treated independently, in practice they are all acting simultaneously. Table S2.1 shows the specific payments at risk in each year, and the potential maximum penalties levied across the 3 programs.

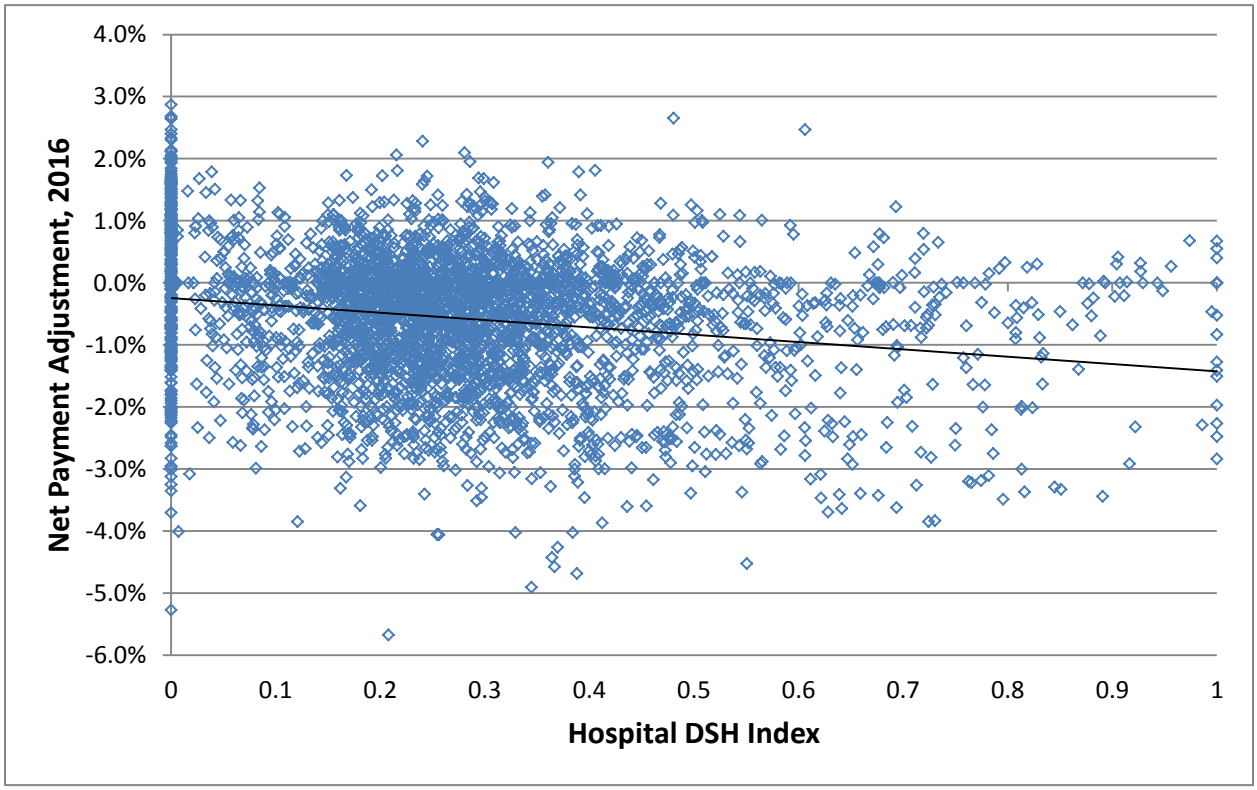
Table S2.1 Hospital Payments at Risk in the 3 Hospital Pay-for-Performance Programs

Program	Focus	FY13	FY14	FY15	FY16	FY17
HRRP (penalties only)	Readmissions	-1%	-2%	-3%		
HACRP (penalties only)	Safety events	N/A	N/A	-1.3%*		
HVBP (penalties or bonuses)	Processes of care, patient experience, efficiency, mortality, safety events	+/- 1%	+/- 1.25%	+/- 1.5%	+/- 1.75%	+/- 2%
Potential Maximum Net Penalty		-2%	-3.25%	-5.8%	-6.05%	-6.3%

* The HACRP reduces a hospital's total IPPS payments instead of reducing a hospital's base-operating DRG payment amounts, which is how the other two programs work. For the purposes of combining the impact of the programs, 1% of total IPPS payments is approximately equivalent to 1.3% of base DRG payments.

The composite payment adjustment across the three hospital programs was calculated by combining the payment adjustments across the three programs for each eligible hospital (Figure S2.1). In reality, very few hospitals receive the maximal payment reduction in the HRRP and HVBP programs, and only 25% of hospitals receive a penalty in the HACRP, so the largest observed payment reduction in FY 2016 of -5.7% was only levied against one hospital. However, many hospitals received a net payment reduction between 2 and 4% of base-operating DRG payments, and ten hospitals received a penalty between 4 and 6% of base-operating DRG payments. There was a relationship between hospital Disproportionate Share (DSH) index and net penalties, with hospitals with higher DSH index having progressively higher penalties, on average, as shown in Figure S2.1:

Figure S2.1: Net Financial Impacts of HRRP, HVBP, and HACRP in FY 2016



However, many hospitals with a DSH Index in the moderate range were able to achieve a net bonus. These results suggest that the chapters that follow should be interpreted not only on their own, but also in the context of their potential combined impact on safety-net and other high-risk hospitals.

CHAPTER 5: The Hospital Readmissions Reduction Program

In This Chapter:

- ***Is there a relationship between beneficiary social risk and readmission rates?***
- ***Is there a relationship between hospital social risk profile and readmission rates?***
- ***Are hospitals that serve a high proportion of beneficiaries with social risk factors more likely to receive penalties under the Hospital Readmissions Reduction Program?***
- ***How would potential policy options to address issues of social risk and performance in the Hospital Readmissions Reduction Program affect program penalties?***

This chapter presents findings on the relationship between beneficiary or hospital social risk and performance under the Hospital Readmissions Reduction Program (HRRP), and examines potential policy options for the HRRP.

Key Findings:

Underlying Relationships

- Dually-enrolled beneficiaries had significantly greater odds of readmission than non-dually enrolled beneficiaries even within the same hospitals, an effect that was relatively similar across hospitals participating in the HRRP.
- There was also a significant hospital effect, suggesting that safety-net hospitals have other unmeasured differences in patient characteristics, provide poorer-quality care to prevent readmissions, or face other barriers that might be related to the availability of resources or community supports.

Program Impacts

- Under the current readmission measures, the differences between hospitals' risk-standardized readmission rates were much smaller than the differences in raw readmission rates.
- Thus, under the current program using the current risk-adjusted measures, the differences in penalties between safety-net and non-safety-net hospitals were small.

Policy Simulations

- Under the current condition-specific program, direct adjustment for dual enrollment or stratifying hospitals by Disproportionate Share Hospital (DSH) Index and then assigning penalties by strata could significantly close the gap in penalties between safety-net and non-safety-net hospitals.
- Rewarding within hospital improvement over previous years, though appealing philosophically, would not impact penalties for safety-net hospitals, even with a bonus for high DSH Index hospitals.
- Under the current penalty formula, moving to a hospital-wide readmission measure would increase penalties for all hospitals. This would also increase the disparity in penalties between safety-net and other hospitals, both in absolute and relative terms.

Strategies and Considerations for the HRRP:

SUMMARY OF STRATEGIES AND CONSIDERATIONS
STRATEGY 1: Measure and Report Quality for Beneficiaries with Social Risk Factors
CONSIDERATION 1: Measure developers should develop readmission measures and/or statistical approaches suitable for reporting of performance for beneficiaries with social risk factors, where feasible.
CONSIDERATION 2: Consider prospectively monitoring for potential unintended consequences. In particular, the cumulative penalties across the three hospital programs for providers that serve beneficiaries with social risk factors should be tracked.
STRATEGY 2: Set High, Fair Standards for All Beneficiaries
CONSIDERATION 1: Readmission measures used in the current program should continue to be examined to determine if adjustment for social risk factors is appropriate.
CONSIDERATION 2: The use of a hospital-wide readmissions measure for the HRRP should be pursued in the long term, as included in the President's budgets for FY 2017 and FY 2016. However, the hospital-wide measure with the current penalty formula creates larger penalties among a smaller number of hospitals and disproportionately impacts the safety net. Therefore, changes to the penalty formula, or additional strategies such as stratification, should be pursued if this measure is implemented.
CONSIDERATION 3: Program measures should be studied to determine whether differences in health status might underlie the observed relationships between social risk and performance, and whether better adjustment for health status might improve the ability to differentiate true differences in performance between providers.
STRATEGY 3: Reward and Support Better Outcomes for Beneficiaries with Social Risk Factors
CONSIDERATION 1: Consider providing additional financial incentives for achievement of low readmission rates for beneficiaries with social risk factors.
CONSIDERATION 2: Consider using existing or new quality improvement programs to provide targeted technical assistance for readmissions reduction to providers that serve beneficiaries with social risk factors.
CONSIDERATION 3: Consider developing demonstrations or models focusing on care innovation that may help reduce readmissions for beneficiaries with social risk factors.

I. Introduction

A. Background

This chapter covers research findings on the relationship between social risk and readmissions, presents a set of policy options, and models how these options would impact safety-net hospitals. It focuses on the Medicare Hospital Readmissions Reduction Program (HRRP), which took effect on October 1, 2012, the first day of fiscal year (FY) 2013. Under this program, which was created as part of the Affordable Care Act, hospitals face payment penalties if they have higher-than-expected readmission rates for a key set of conditions common in the Medicare population. The program initially focused on acute myocardial infarction (acute MI), heart failure (HF), and pneumonia, but has now expanded to include chronic obstructive pulmonary disease (COPD), total knee or hip arthroplasty (TKA/THA), and coronary artery bypass grafting (CABG). Program penalties are applied to Medicare base-operating diagnosis-related group (DRG) payments, across hospitals' total Medicare book of business.

The HRRP follows a specific methodology to calculate risk-standardized readmission rates for each hospital in the program. This methodology adjusts for age, sex, and medical comorbidities and uses the statistical technique of multilevel modeling with hospital-specific intercepts so that the model compares a particular hospital's performance on the readmission measure to the average performance of a hospital with the same case mix. The HRRP penalty is based on payments for these higher-than-expected readmissions as a proportion of total payments for all admissions. Thus, the proportion of all payments for the five conditions currently included in the excess readmission calculation is a significant driver of the size of penalties.

In the first year of the program, the maximum penalty was 1% of base DRG payments; in 2014 this maximum penalty rose to 2%, and in 2015 to 3%, where it will remain. Evidence suggests that the program has been successful: from 2007 to 2015, readmission rates for targeted conditions declined from 21.5% to 17.8%, with the majority of the decline seen shortly after the passage of the Affordable Care Act and announcement of the HRRP, followed by a slower decline from 2013 to 2015. Though decreases in readmission rates were seen for both targeted and non-targeted conditions, the declines for targeted conditions were larger.[1]

The appropriateness and desirability of accounting for social risk factors in the HRRP has been the source of significant debate. Some have suggested altering the program to reduce the impact of HRRP penalties on safety-net providers,[2] but these suggestions have been controversial. Proponents of including a measure of socioeconomic status (SES) in the HRRP argue that safety-net hospitals face penalties for outcomes that are beyond their control, pointing out that factors such as the availability of primary care, housing stability, medication adherence, and mental health and substance use disorders impact readmission rates, are not evenly distributed between hospitals, and are not accounted for when judging hospital performance. On the other hand, some worry that accounting for SES in the HRRP program will institutionalize poor performance in the safety-net, sending the implicit message that worse clinical outcomes at these hospitals are acceptable.

B. Existing Research on Social Risk Factors and the Hospital Readmissions Reduction Program

The association between social risk factors and readmission rates is well established. Prior studies have associated social risk factors such as income, race and ethnicity, education, and social support with readmissions at the patient level,[3-10] showing that hospitals with higher proportions of poor and minority beneficiaries have higher readmission rates.[11-13] Studies have also shown that beneficiaries[14-17] and hospitals[18,19] in high-poverty communities have higher readmission rates. Further, safety-net hospitals have a higher likelihood of being penalized under the HRRP, with over 70% of hospitals with the highest proportion of poor beneficiaries nationally receiving a penalty in the program's first year, compared with roughly 40% of hospitals with the fewest poor beneficiaries.[20] Similar findings have been reported for subsequent program years.[21,22] However, some observers have argued that the proportion of the difference between high and low performing hospitals related to social risk factors is small compared to other, less controversial factors, such as unmeasured medical severity. Moreover, the sources of much of the differences in readmission rates between beneficiaries with social risk factors and other beneficiaries is unknown.[23]

In response to these findings, many in the hospital and academic communities have advocated for changes to the HRRP that might take social risk into account.[24-26] Congress has also discussed including social risk factors in the HRRP measures.[f]

C. Limitations

Among the caveats and limitations worth noting in these analyses is the difficulty in ascertaining individual social risk factors due to data limitations, as outlined in Chapter 2. In addition, the risk-standardization technique used in the HRRP has its own limitations: this technique estimates readmission rates that are nearly identical to the average readmission rate for small hospitals, so small hospitals are unlikely to have readmission rates that are much different than expected, no matter what their actual performance. This limitation likely has particular implications for rural providers, which tend to be small. This report is limited to historical performance of the HRRP; as past performance may not perfectly predict future performance, the policy simulations should be interpreted as estimates only. Finally, the analyses in this chapter do not include the CABG readmission measure, as it was only added to the program in fiscal year 2017.

Beyond these technical limitations, the fact that the HRRP is a penalty program in some ways limits the options for program modification. Changes to the HRRP may create additional incentives for hospitals to reduce readmissions, while at the same time removing financial resources necessary to do so. Even for hospitals not facing penalties, if preventing readmissions is more costly for beneficiaries with social risk

[f] Two bills were proposed in the 113th Congress (2013-2014), S.2501, "Hospital Readmissions Program Accuracy and Accountability Act," introduced by Senators Joe Manchin (D-WV), Bill Nelson (D-FL), Mark Kirk (R-IL), and Roger Wicker (R-MS), and H.R. 4188, the "Establishing Beneficiary Equity in the Hospital Readmission Program Act," introduced by Representative Jim Renacci (R-OH).

factors, approaches beyond the HRRP, such as wraparound programs, may be necessary to provide additional resources to prevent readmissions for these beneficiaries.

D. Framework for the Chapter: Analytic Findings, Policy Simulations, Strategies, and Considerations

The remainder of this chapter is structured as follows. First, it describes underlying relationships between social risk and performance on the readmission measures that comprise the HRRP. Next, it examines the performance of hospitals serving beneficiaries with social risk factors on these measures, focusing particularly on safety-net institutions, and then the performance of these hospitals under the HRRP penalty calculations. It outlines and simulates a set of potential policy options, including adjustment, stratification, and rewarding improvement. Finally, strategies and considerations for the HRRP are presented, using the strategic framework outlined in Chapter 1: 1) measure and report quality for beneficiaries with social risk factors; 2) set high, fair standards for all beneficiaries; and 3) reward and support better outcomes for beneficiaries with social risk factors. These three strategies build on each other to address social risk in Medicare payment programs.

II. Beneficiary and Provider Characteristics

These analyses examined social risk factors including dual enrollment as a marker of low-income status, local area income, race, ethnicity, and rurality,[g] and found that dual enrollment was the strongest predictor of readmission. The relationships between race or ethnicity and readmission rates were largely mediated by dual enrollment, whereas relationships between rurality and readmission rates were inconsistent (please see the Appendix for full results on these social risk groups). Thus, this chapter will focus primarily on beneficiaries who are dually enrolled in Medicaid and Medicare, a group that includes individuals receiving both full and partial dual benefits. Also included are area-level variables for community social risk factors, such as median income and average educational attainment in the local area. The hospital-level analyses concentrated on safety-net hospitals, defining them as those hospitals that treat a large proportion of poor beneficiaries as indicated by being in the top quintile of the Disproportionate Share Hospital (DSH) Index, and alternatively as the top quintile of hospitals by the proportion of beneficiaries receiving Supplemental Security Income (SSI).

A. Beneficiary Characteristics

Of eligible admissions for the HRRP measures, approximately 22% were for dually-enrolled beneficiaries in fiscal year 2013. Compared to non-dually-enrolled beneficiaries, these individuals had higher rates of dementia, heart failure, chronic kidney disease, depression, diabetes, and other important comorbidities (Table 5.1).

[g] Additional detail on how these social risk factors were defined is included in Chapter 2 and the technical appendix to this chapter.

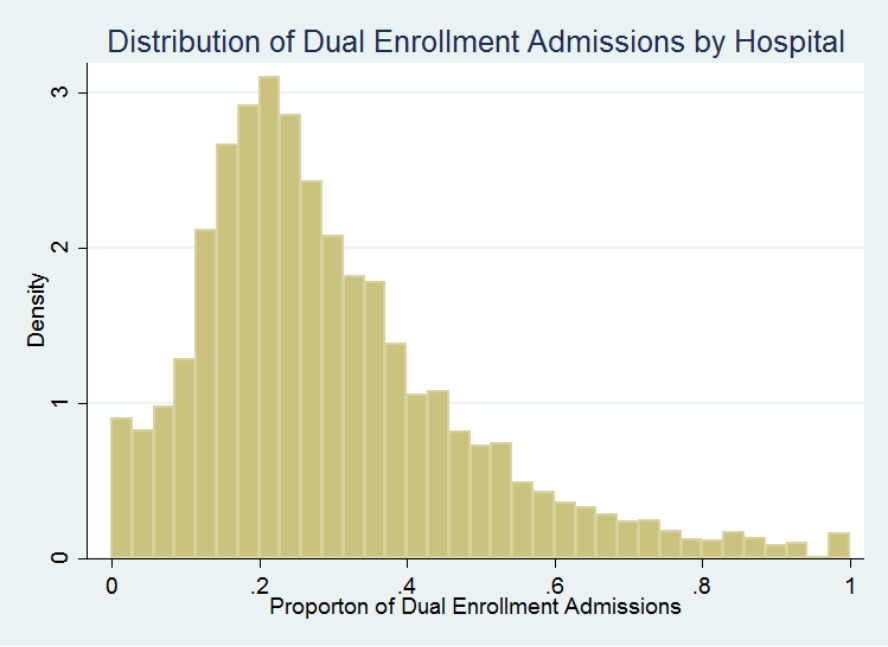
Table 5.1. Proportion of Beneficiaries with Select Conditions by Dual Enrollment Status

Comorbidity	Dually-enrolled	Not Dually-enrolled
Alzheimer's Disease, Related Disorders, or Senile Dementia	8.6%	4.0%
Heart Failure	17.3%	12.8%
Chronic Kidney Disease	14.4%	10.7%
Chronic Obstructive Pulmonary Disease	12.8%	8.7%
Depression	9.8%	6.2%
Diabetes	14.3%	10.0%
Ischemic Heart Disease	18.3%	15.9%
Osteoporosis	3.9%	3.2%
Stroke/Transient Ischemic Attack	3.4%	2.3%

B. Provider Characteristics

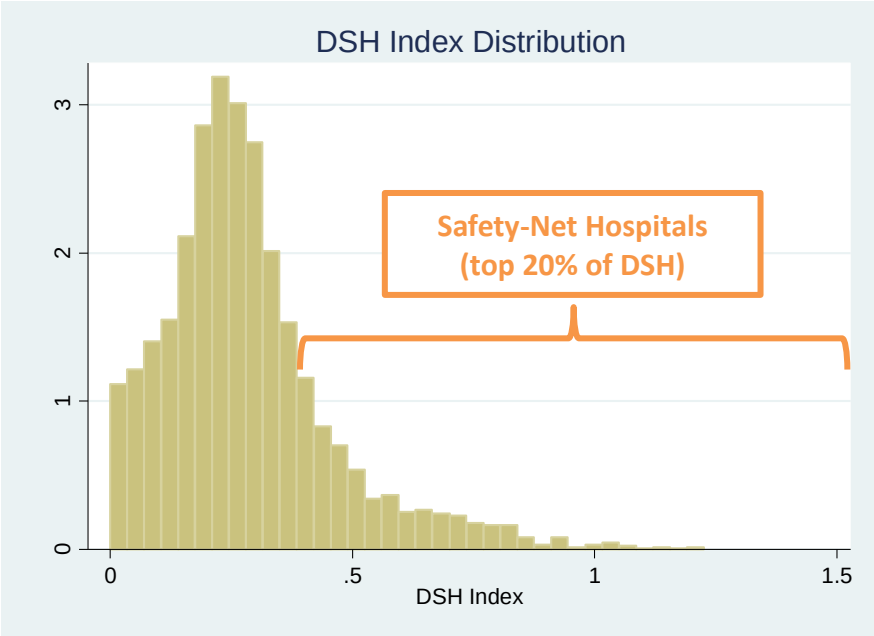
The distribution of dually-enrolled Medicare beneficiaries across hospitals shows an average of around 22% and a median of 26% with a long right tail (Figure 5.1).

Figure 5.1. Distribution of Dually-Enrolled Admissions by Hospital



Patterns by DSH Index are similar. The top quintile, the cutoff used to determine safety-net status, is shown in Figure 5.2.

Figure 5.2. Designation of Safety-Net Hospitals



III. Beneficiary Social Risk Factors and Readmission Rates

The first analysis initially considered whether beneficiaries with social risk factors have higher readmission rates, and if so, whether the higher rates are primarily related to patient characteristics, or to the hospitals at which these beneficiaries seek care.

A. Odds of Readmission for Dually Enrolled Patients

Regression models that isolated the within-hospital effect of dual enrollment to compare outcomes for dual versus non-dual enrollment within hospitals were used to determine whether differences in outcomes for dually enrolled beneficiaries were independent of the hospitals where they sought care. Dual enrollment was associated with 24-67% higher odds of readmission across conditions (Table 5.2, left column). After accounting for clinical risk factors, the impact of dual enrollment substantially lessened (dropping about in half), but was still associated with a 10-31% higher odds of readmission (middle column). This reduction in the odds ratio indicates that there is some correlation between dual enrollment and health status as measured by the HRRP risk adjustment. Adding other social risk factors such as rurality, race, and area characteristics reduced the independent effect of dual enrollment somewhat, but it remained significantly associated with 7-28% higher odds of readmission across conditions (rightmost column). In order to test for residual confounding by proportion dually-enrolled, an additional model included a categorical measure of hospitals' DSH Index. Results did not change substantially in these models.

Table 5.2. Odds Ratio for Readmission for Dually-Enrolled Patients

	Dual Enrollment Alone	Dual Enrollment, Adjusting for Comorbidities (Using the HRRP Risk Adjustment)	Dual Enrollment, Adjusting for Comorbidities and Other Social Risk Factors*
Acute MI	**1.45**	**1.14**	**1.10**
Heart Failure	**1.24**	**1.13**	**1.10**
Pneumonia	**1.26**	**1.10**	**1.07**
THA/TKA	**1.67**	**1.31**	**1.28**
COPD	**1.44**	**1.15**	**1.12**

MI=myocardial infarction; THA=total hip arthroplasty; TKA=total knee arthroplasty; COPD=chronic obstructive pulmonary disease. Models include a hospital random effect. *Model includes the HRRP risk adjustment (age, gender, medical comorbidities); beneficiary measures (rurality, self-reported race; and ZIP code variables (income, education, racial composition, English language proficiency, marital status, employment rate, poverty rate, median home value). Odds ratios greater than 1 indicate increased risk of readmission; odds ratios less than 1 indicate reduced risk of readmission. Bolded odds are significant at $p<0.05$.

Individuals from low-income areas, as well as Black and Hispanic beneficiaries, were also more likely to be readmitted; rural individuals were less likely to be readmitted. When all social risk factors were entered into a single model, dual enrollment was generally the dominant factor, while the other factors became nonsignificant in many cases (see Appendix).

It is important to note that these models do not reveal *why* dually-enrolled beneficiaries are more likely to be readmitted – an outcome that is likely multifactorial. Higher readmission rates could be attributed to unmeasured or unobserved factors that might be picked up in more detailed measures of social risk (such as social support, health literacy, etc.), unmeasured co-morbidity (including worse functional status, more advanced disease, etc.), availability of community supports after discharge, or differences in the quality of care between dual and non-dual enrollment within the same hospital or after discharge.

C. Consistency of Relationship Between Dual Enrollment and Readmission

The next analysis evaluated the variability of the relationship between dual enrollment and readmissions across hospitals for each of the conditions measured. Regression models that calculated the difference between the odds of readmission for dual and non-dual enrollment at each hospital for each condition were used, with results shown in Figure 5.3 below. The figure shows the distribution of the effect of dual enrollment: 50% of hospitals had an odds ratio of readmission for dual versus non-dual enrollment in the shaded box. For example, for heart attack, 50% of hospitals were between 1.12 and 1.14. For heart failure, the effect was even more consistent: 50% of hospitals are between 1.119 and 1.125. THA/TKA was not included in this analysis due to small sample sizes.

Figure 5.3. Consistency of Dual Enrollment Effect

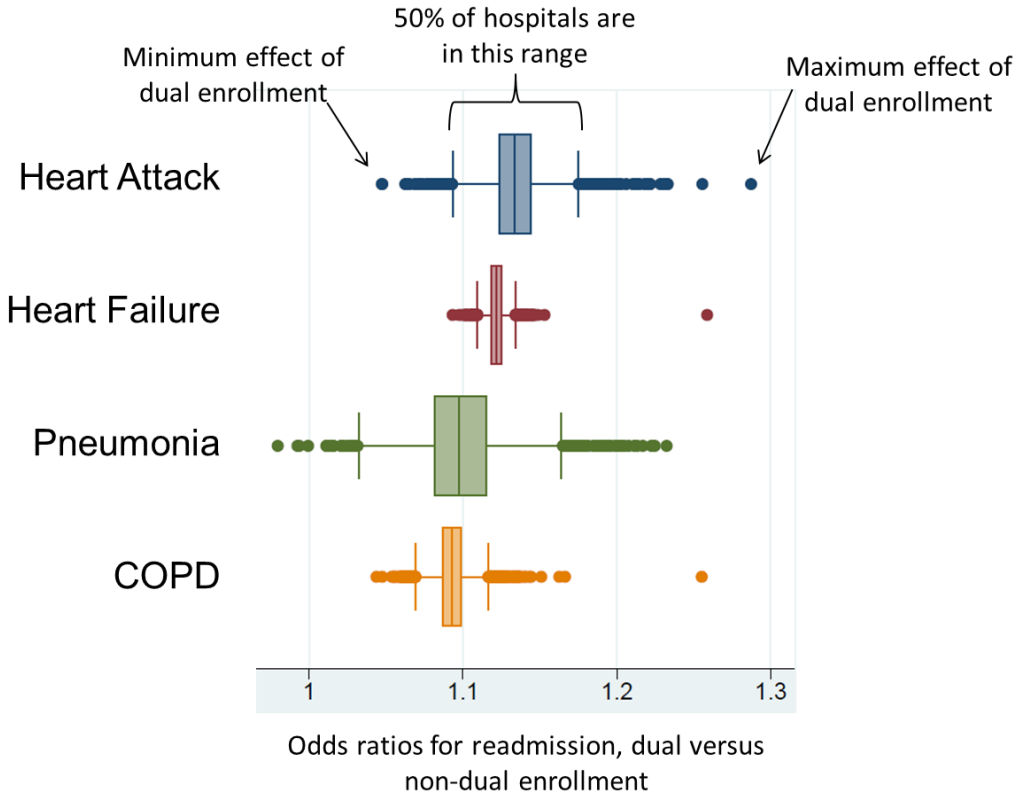


Figure 5.3 demonstrates that the relationship between dual enrollment and readmission was generally consistent across hospitals. For three of the four conditions examined, dually-enrolled beneficiaries were more likely to be readmitted at every hospital in the sample.

IV. Provider Social Risk Factors and Readmission Rates

A. Odds of Readmission for Safety-Net Hospitals

The relationship between safety-net hospital status, defined as the top quintile of the DSH Index, and the risk of readmissions was evaluated next. Patients seen at safety-net hospitals had 9-20% higher odds of readmission (Table 5.3, left column). After controlling for patient comorbidities, safety-net status remained associated with 9-14% higher odds of readmission (middle column), and after additionally controlling for beneficiary social risk, 5-9% higher odds of readmission (right column).

Table 5.3. Odds Ratio for Readmission for Patients Discharged from Safety-Net Hospitals

	Safety-Net Status Only	Safety-Net Status, Adjusting for Comorbidities (Using the HRRP risk adjustment)	Safety-Net Status, Adjusting for Comorbidities, Beneficiary Social Risk Factors, and Hospital Characteristics*
Acute MI	**1.20**	**1.14**	**1.09**
Heart Failure	**1.12**	**1.10**	**1.06**
Pneumonia	**1.12**	**1.09**	**1.05**
THA/TKA	**1.09**	**1.09**	**1.09**
COPD	**1.18**	**1.12**	**1.06**

MI=myocardial infarction; THA=total hip arthroplasty; TKA=total knee arthroplasty; COPD=chronic obstructive pulmonary disease. *Model includes hospital random effects, and includes the HRRP risk adjustment variables (age, gender, medical comorbidities); beneficiary social risk factors (dual enrollment, disability, urban, self-reported race); ZIP code variables (income, education, racial composition, English language proficiency, marital status, employment rate, poverty rate, median home value), and other hospital characteristics (teaching, margin, member of a system, size, urban, and ownership). Odds ratios greater than 1 indicate increased risk of readmission; odds ratios less than 1 indicate reduced risk of readmission. Bolded odds are significant at $p<0.05$.

These findings suggest that being discharged from a safety-net hospital was associated with a higher risk of readmission, even after accounting for individual social risk factors. Again, these models do not reveal *why* this is the case; possibilities include unmeasured differences in patient population, differences in the quality of care delivered at safety-net compared to non-safety-net hospitals, or differences in the quality of care these beneficiaries receive after discharge.

D. Comparison of Beneficiary and Provider Social Risk Effect

The findings presented here suggest a consistent and sizeable within-hospital effect of dual enrollment on readmission rates, which means that even within the same hospital, there is a significant difference between dual and non-dual enrollees in the likelihood of being readmitted. There is also a hospital effect associated with being discharged from a safety-net hospital. Only about half of the difference between safety-net and non-safety-net hospitals was attributable to measured medical and social risk factors, with the remaining almost one-half of the difference unexplained with currently-available data. Therefore, the higher risk of readmission for beneficiaries with social risk factors is in part related to the social risk profile, and in part related to receiving care at lower-quality hospitals; the higher readmission rates seen at safety-net hospitals are in part related to the beneficiary mix and in part due to the hospital's overall performance.

V. Social Risk and Performance Under the Hospital Readmissions Reduction Program

A. Hospital Performance

The first step in administering the HRRP is to calculate the risk-standardized readmission rate for each hospital. These rates are shown by group in Table 5.4, again defining safety-net as the top 20% of DSH Index.

Table 5.4. Risk-Standardized Readmission Rates by Safety-Net Status

	Safety-Net Hospitals (top 20% of DSH)	Non-Safety-Net (all other) Hospitals	Difference
Acute MI	19.2%	16.5%	2.7%
Heart Failure	23.7%	21.6%	2.1%
Pneumonia	17.9%	16.3%	1.6%
THA/TKA	5.0%	4.5%	0.5%
COPD	16.6%	14.5%	2.1%

MI=myocardial infarction; THA=total hip arthroplasty; TKA=total knee arthroplasty; COPD=chronic obstructive pulmonary disease.

B. HRRP Penalties

After calculating risk-standardized readmission rates, CMS uses a complex formula to translate these rates into penalties. Briefly, CMS calculates the ratio of predicted to expected readmissions and labels this the Excess Readmission Ratio (ERR), which represents how much higher (or lower) a hospital's readmission rate is than expected. For example, a ratio of 1.1 would indicate that a hospital's readmission rate was 10% higher than expected. That ratio is then used to calculate the dollars that CMS paid to hospitals for "excess" readmissions. These "excess" dollars are divided by total dollars to yield the final adjustment factor, a number between 0.97 and 1.0 that is used to determine hospitals' penalties. A hospital with an adjustment factor of 0.97 has its payments multiplied by 0.97 – thus leading to a 3% penalty or reduction from what would have been paid with performance at or above the expected readmission rate (see Appendix).

The functional effect of these calculations is to further decrease variability between hospitals, such that relatively large differences in readmission rates translate into much smaller differences in the assessed penalties. Thus, under the current formula, safety-net hospitals are more likely to be penalized (87% versus 81%, Table 5.5), but penalties at safety-net hospitals are similar to those at non-safety-net hospitals as a percent of base DRG payments: 0.48% versus 0.45% (Table 5.5, rightmost column). However, these translate into slightly higher penalties in terms of dollars, at $191,000 on average for safety-net hospitals versus $150,000 on average at non-safety-net hospitals, due to the fact that safety-net hospitals tend to be larger than non-safety-net hospitals and thus have higher base DRG payments.

Table 5.5. Current Penalties Under the HRRP

	Percent of Hospitals Penalized	Penalty In Thousands of Dollars	Penalty as Percent of base DRG payment
All Hospitals	81%	$158	0.46%
Safety-Net Hospitals (top 20% of DSH)	87%	$191	0.48%
Non-Safety-Net (all other) Hospitals	80%	$150	0.45%

When considering the safety-net to be the top 20% of hospitals by SSI, there were slightly larger differences between groups, with an average penalty in the safety-net of 0.53% of base DRG payment compared to 0.44% of base DRG payment in non-safety-net hospitals.

VI. Policy Options

A. Introduction

Policy options are simulated, and weighed against the policy criteria outlined in Chapter 1 to ultimately inform strategies and considerations for accounting for social risk. Those policy criteria are reiterated in Table 5.6:

Table 5.6 Policy Criteria

Policy Criteria
1. Encourages reduction in disparities in quality and outcomes
2. Protects beneficiaries' access to care by reducing disincentives to caring for high-risk populations
3. Protects providers from unfair financial stress
4. Adjusts only for the difference in performance related directly to the social risk factor, and only for what is beyond provider control
5. Promotes transparency to facilitate consumer choice
6. Supports delivery system reform and Alternative Payment Models

How policymakers weight these criteria could differ. For example, some may feel that protecting providers from unfair financial stress is the most important criterion, and may be willing to adjust for factors under providers' control or negatively impact transparency to achieve that goal. On the other hand, some may feel that transparency is the most important criterion, and argue that avoiding financial stress for providers or promoting delivery system reform are less important policy considerations.

Five policy options were considered for modifying the current HRRP: keeping the status quo ("status quo"), adjusting for risk ("risk adjustment"), stratifying hospitals into groups ("stratification"), rewarding improvement ("reward improvement"), and moving to a hospital-wide readmission measure ("hospital-wide readmissions"). Table 5.7 describes each of these options. For the most part, these options have been evaluated independently. However, more than one could be implemented together, as is demonstrated with moving to a hospital-wide readmission measure.

Table 5.7. Summary of the HRRP Policy Options

Option	Description	Pros	Cons
1. Status Quo	Maintain the current policy for the HRRP pending further IMPACT studies.	• Promotes transparency to facilitate consumer choice • Promotes reduction in disparities in quality and outcomes	• Does not address policy concerns regarding social risk and programmatic impact on providers
2. Adjust readmission rates for social risk	Add social risk factors to the formula for calculating readmissions.	• Adjusts only for the difference in performance related directly to the social risk factor • May protect providers from unfair financial stress	• May discourage reduction in disparities in access, quality, and outcomes compared to the status quo • Reduces transparency to facilitate consumer choice • May adjust for factors within provider control
3. Stratify hospitals into groups	Break hospitals into groups based on the proportion of poor patients.	• Protects providers from unfair financial stress • Has stakeholder support including Medicare Payment Advisory Commission (MedPAC)	• May adjust for differences in performance beyond the social risk factor • May adjust for factors within provider control • Tiers are artificial; might create unusual "cliffs." • Might discourage reduction in disparities in quality and outcomes if hospitals performing well on an absolute scale are penalized
4. Reward improvement	Reward hospitals that improve their performance.	• Encourages hospitals to provide high quality care to all patients, including those socially at risk, by giving hospitals the chance to reduce penalties by improving, even if absolute performance remains low	• Does not adjust for social risk • Because hospitals' performance is judged on a three-year rolling time frame, improvements tend to be minimal
5. Hospital-wide readmissions	Base penalties on a hospital-wide readmission measure rather than condition specific measures.	• Promotes reduction in disparities in quality and outcomes • Promotes transparency to facilitate consumer choice • Uses only one year of data instead of three	• Without a change to the payment formula, would greatly increase penalties

The remainder of this section provides a more detailed explanation of each option, together with results of policy simulations of the proposed policy's potential impact. Additional information on the methodology used for each simulation is in the Appendix to this chapter.

B. Status Quo

Since the HRRP's implementation, there has been concern that it unfairly penalizes safety-net hospitals. Much of this concern may have been due to the observed absolute difference in readmission rates between these institutions and other hospitals. Through the first three years of the HRRP, however, differences in penalties between safety-net and other institutions have been relatively small. CMS's current method of calculating excess readmissions, especially the clinical risk adjustment factors, has minimized differences in readmission rates as they apply to calculating penalties. Indeed, once current risk adjustment factors are accounted for, available measures of social risk only explain a small share of the remaining difference between safety-net and other hospitals. Thus, for the current group of targeted conditions, making modifications to the HRRP may be less urgent in the short run – providing more time to understand the role of social risk factors beyond measures included in current Medicare data. Advocates of the status quo also believe that prior to redistributing penalty dollars; it may be prudent to understand the significant amount of remaining unexplained difference in readmissions between the two sets of hospitals better.

Taking the time to understand these differences better would be particularly useful with respect to the stratification option, which potentially carries the largest redistribution (see below). To the extent the currently unexplained difference is related to factors reasonably beyond the control of hospitals, such as yet unmeasured social risk, such redistribution may be beneficial. On the other hand, if the unexplained difference is related to care processes and quality, such redistribution may provide the wrong incentives for hospitals and would be inconsistent with delivery system transformation goals. Further research authorized by the IMPACT Act will examine additional data sources with more detailed information on beneficiary social risk factors that may contribute to this currently unexplained variation.

An alternative point of view is that existing findings already demonstrate that social risk factors are strongly related to an individual's risk of readmission – with odds ratios similar to or larger than those associated with many of the clinical risk factors in the current risk adjustment models – and thus that accounting for this relationship in some way is warranted to improve the accuracy and fairness of the HRRP. From this perspective, the following policy options might be considered.

C. Adjust Readmission Rates for Social Risk Factors

This option would adjust readmission rates for patient or community social risk factors. The adjustment could be applied directly at the measure level in the same way that adjustments for age, gender, or comorbidities are currently made. Alterations to a measure would likely, though not certainly, require that it re-enter the testing, validation, and approval process with the National Quality Forum.

From a budgetary standpoint, adjusting for patient factors would improve overall performance on the measures and reduce total penalties. To be budget neutral, the penalty calculation would need to be changed or re-scaled.

Two versions of this adjustment have been simulated. The first modeled the impact of adjusting for dual enrollment status at the patient level, without any additional covariates such as ZIP code median income or rurality. This reduced penalties for safety-net hospitals (defined as those in the top 20% by the DSH Index) from $191,000 under the current penalty to $169,000 under adjustment on average, with marginal changes for non-safety-net hospitals (Table 5.8). As a percent of base DRG payments, safety-net hospitals would actually receive lower penalties after adjustment than non-safety-net hospitals.

Table 5.8. Results of Adjusting Readmission Rates for Social Risk Factors

	Current Penalty			New Penalty (adjusted for dual enrollment only)		
	% of Hospitals Penalized	Penalty in Thousands of $	Penalty as % of base DRG payment	% of Hospitals Penalized	Penalty in Thousands of $	Penalty as % of Base DRG payment
All Hospitals	81%	$158	0.46%	81%	$156	0.44%
SNH (top 20% of DSH)	87%	$191	0.48%	84%	$169	0.42%
Non-SNH (all other)	80%	$150	0.45%	81%	$153	0.45%

Taking patient dual enrollment status into account would remove the gap in penalty percentage by making the percentage penalty for safety-net hospitals smaller than other hospitals, while reducing the disparity in penalty dollars between the two groups. Additionally adjusting for rurality, ZIP code per-capita median income, and ZIP code average education attained would further attenuate the dollar differences between safety-net and non-safety-net (see Appendix), with penalties for safety-net hospitals reduced from $191,000 to $151,000 on average. However, as discussed in chapter 3, incorporating ZIP code-level factors into policy may be challenging due to its imprecision and lack of validation.

One downside of any modification to account for social risk factors is that it may make absolute quality differences less visible so that beneficiaries cannot distinguish whether a particular hospital's performance is high quality in an absolute or only a relative sense. However, this issue of transparency could be mitigated by reporting readmission rates that do not account for social risk while paying based on readmission rates that do.

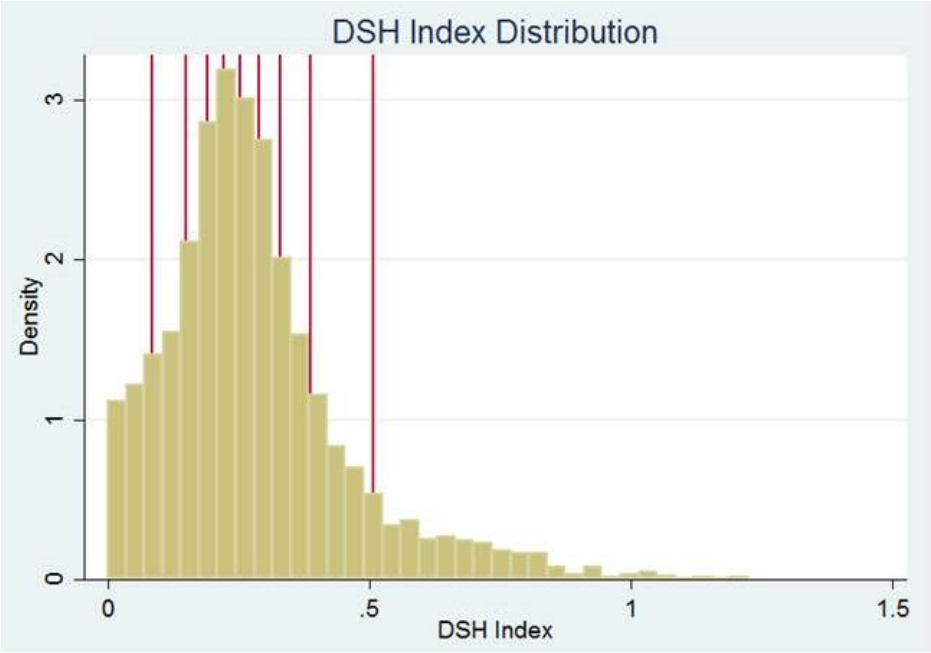
D. Stratification

This policy option aims to compare "like with like" by breaking hospitals into two or more groups based on the proportion of dually-enrolled beneficiaries served. Hospitals would be judged only against their peers, and penalties would be assessed based on the average performance within each group rather than the average performance overall. For example, a readmission rate of 16% might be worse-than-average performance if a hospital has very few poor beneficiaries, and might lead to a penalty assessment, while a readmission rate of 16% at a hospital with a very large proportion of poor beneficiaries might be better than average within this group and lead to no penalty.

The benefit of stratification is that it recognizes that there may be unmeasured and possibly unmeasurable differences between hospitals that serve high proportions of beneficiaries with social risk factors and other hospitals, and thus aims to compare similar hospitals to one another. This option is presumably near budget-neutral since it would reassign penalties across groups. The main drawback is that it potentially rewards different absolute levels of performance differently in one group than another. Reducing transparency may also be a drawback, depending on how such a policy were implemented. If only stratified payments were reported, it would be difficult for consumers to evaluate performance. However, if stratification were done after measure calculation, measure scores could be compared between all hospitals even though payment would be decided based on the cutoff points within each stratum.

Two methods for stratifying hospitals into peer groups were evaluated. The first stratification method was into just two groups: safety-net and non-safety-net, using the top quintile of the DSH Index as the stratification cutoff as shown in Figure 5.2. The second method stratified hospitals into ten groups by deciles of DSH Index. The red lines in Figure 5.4 demonstrate where the cutoffs fell along the DSH Index for the decile approach, with the top decile representing a large range of DSH index values. The downside to using two groups is that the groups were more heterogeneous; the downside to using ten groups was the complexity of multiple "cliffs" of performance in which hospitals with relatively similar readmission rates could face different penalties as a result of being in different strata.

Figure 5.4: Deciles of DSH index



Stratification into two groups significantly reduced penalties for hospitals in the safety-net (from $191,000 to $141,000 on average, Table 5.9) and increased penalties for non-safety-net facilities.

Table 5.9. Results of Stratification by DSH Index

	Current Penalty			New Penalty (after stratifying hospitals into 2 groups)		
	% of Hospitals Penalized	Penalty in Thousands of $	Penalty as % of Base DRG Payment	% of Hospitals Penalized	Penalty in Thousands of $	Penalty as % of Base DRG Payment
All Hospitals	81%	$158	0.46%	81%	$159	0.47%
SNH (top 20% of DSH)	87%	$191	0.48%	76%	$141	0.34%
Non-SNH (all other)	80%	$150	0.45%	82%	$163	0.50%

Stratification into deciles by DSH Index similarly reduced penalties for hospitals in the safety-net (from $191,000 to $144,000 on average) and increased penalties for non-safety-net facilities (see Appendix).

E. Rewarding Improvement

In contrast to other Medicare pay-for-performance programs, such as Hospital Value-Based Purchasing, the HRRP currently rewards only achievement, not improvement. Rewarding improvement would potentially encourage better performance even among those hospitals unlikely to meet the no penalty threshold. Choosing this option would also be responsive to stakeholder input from hospitals, which have argued that they should have an opportunity to be rewarded for improvement even if they have not yet achieved high quality on an absolute scale.

One drawback, however, is that rewarding improvement does not explicitly address social risk. In particular, if achievement is difficult in a socially at-risk population, improvement may be equally difficult. Since performance under the HRRP is assessed on a three-year rolling average, moreover, improvement tends to be small in any given year. In addition, this option would necessitate changing the penalty calculation for the program to remain budget neutral, since it would decrease overall penalties by reducing them for some hospitals.

In the simulation for this option, hospitals could earn a bonus based on improvement over the prior year. Hospitals that received no penalty because they had met the benchmark for achievement were classified as the "attainment" group and continued to have no penalty. Hospitals that were receiving a penalty received a bonus equal to 50% of their improvement from the prior year – for example, a hospital that improved from a penalty of 2% to 1% would see its penalty reduced by an additional 0.5% as an "improvement bonus." This bonus only minimally reduced penalties for hospitals in the safety-net (from $191,000 to $185,000 on average, Table 5.10) and had a similar impact for non-safety-net facilities. These results suggest that rewarding improvement would have a limited ability to reduce the burden on safety-net hospitals because they are not improving at a faster rate than non-safety-net hospitals. Findings were similar when the improvement bonus was equal to raw improvement multiplied by a hospital's DSH Index (see the Appendix to this chapter).

Table 5.10. Results of Rewarding Improvement

	Current Penalty			New Penalty (after applying an improvement bonus)		
	% of Hospitals Penalized	Penalty in Thousands of $	Penalty as % of Base DRG payment	% of Hospitals Penalized	Penalty in Thousands of $	Penalty as % of Base DRG payment
All Hospitals	81%	$158	0.46%	81%	$144	0.42%
SNH (top 20% of DSH)	87%	$191	0.48%	87%	$176	0.43%
Non-SNH (all other)	80%	$150	0.45%	80%	$137	0.42%

In sum, rewarding improvement, while responsive to the concerns of some stakeholders, did not significantly change the distribution of the penalties between safety-net and non-safety-net hospitals. However, it is conceivable that other versions of an improvement bonus might yield different results.

Another way to reward improvement besides changing the penalty formula would be to provide bonuses for hospitals focused on improving readmission rates for beneficiaries with social risk factors, and requiring that such bonuses would be used to improve quality of care for these populations. This could mean that hospitals are able to buy down their penalty if the money is used to improve quality of care for beneficiaries with social risk factors. Or, hospitals that are able to reduce readmission rates for these beneficiaries could receive a bonus that must be used to further improve quality of care.

F. Moving to a Hospital-Wide Readmissions Measure

1. Introduction

Moving to a hospital-wide readmissions measure, namely one that considers all or nearly all hospital discharges rather than only a select set of conditions, has gained significant support in recent years. MedPAC has recommended moving to such a measure;[2] a National Quality Forum-endorsed hospital-wide measure is currently used for quality reporting on Hospital Compare,[27] and all-condition readmission rates are an existing component of the Medicare Shared Savings program[28] and the Physician Value-based payment modifier program.[29] This concept is also included as a legislative proposal in the President's budgets for FY 2016 and FY 2017.[h]

A number of factors make a hospital-wide measure more appealing than current condition-specific measures. First, the hospital-wide measure includes many, though not all, admissions, and thus provides

[h] United States Department of Health and Human Services. Fiscal Year 2016 Budget in Brief. 2015; http://www.hhs.gov/sites/default/files/budget/fy2016/fy-2016-budget-in-brief.pdf and United States Department of Health and Human Services. Fiscal Year 2017 Budget in Brief. 2016; http://www.hhs.gov/sites/default/files/fy2017-budget-in-brief.pdf.

incentives for improvement across a wider range of medical and surgical conditions (moving from approximately 15% to 55% of hospital payments; note this number does not reach 100% because many admissions are still excluded, including some cancer-related admissions, mental health-related admissions, etc.). Recent research has demonstrated that the decreases in readmission rates after adoption of the HRRP was greater for the three conditions initially targeted by the program, suggesting that casting a wider net might lead to greater overall improvements in outcomes.[1] In addition, because the yearly sample size is larger, a hospital-wide measure can be based on only one year of data instead of three, thus more accurately reflecting improvements in care as they happen and facilitating consumer choice by making publicly-reported rates more comparable to current rates. Furthermore, a single all-condition measure would clarify the program's intent of improving care and reducing costs for all hospitalized Medicare beneficiaries, not just those hospitalized with one of a few target conditions.

A hospital-wide measure also has the potential to include more hospitals because the measure includes a broader range of hospitalized beneficiaries, thus increasing the sample size. However, there is a tradeoff in that the hospital-wide measure is based on one year of admissions, whereas the current condition-specific measure uses three years of data. Analyses based on 2013 admissions suggest that using the hospital-wide measure would have a net gain of less than 1% of hospitals eligible for the program. Thus, the impact of moving to the hospital-wide measure, in terms of additional hospitals participating in the program, would be minor.

One significant impact of a hospital-wide measure could be putting a significantly higher number of dollars at risk for penalties under the statutorily defined payment formula. Since this measure has not yet been formally proposed as a payment program, though, the manner in which penalties would be calculated is as yet unclear. Given growing support for the hospital-wide measure, as well as a lack of prior research examining the relationships between social risk factors and the components of this measure, these issues were examined using a similar methodology for the condition-specific measures. As one possible solution, penalties were scaled to be budget neutral with respect to current penalties.

2. Relationship between Social Risk and Performance under a Hospital-Wide Alternative to the HRRP

To model the hospital-wide alternative to the HRRP, the current HRRP methodology was used to translate the Excess Readmission Ratio (ERR) to penalties. The HRRP uses a hierarchical regression model to account for patient factors and assign a risk-standardized readmission rate for each of five cohorts to each hospital eligible for the HRRP. These rates by safety-net status are shown in Table 5.11. As outlined above, after calculating these risk-standardized readmission rates, CMS then translates them into penalties based on payments for excess readmissions as a proportion of total payments.

Table 5.8. Risk-Standardized Readmission Rates by Safety-Net Status

	Safety-Net Hospitals (top 20% of DSH)	Non-Safety-Net (All Other) Hospitals
Hospital-Wide	17.7%	15.6%
Surgical	17.7%	14.4%
Medical	17.4%	15.8%
Cardiovascular	16.4%	15.0%
Cardiorespiratory	20.7%	18.9%
Neurology	19.2%	17.8%

Applying this formula in modeling the hospital-wide option led to two important observations, as shown in Table 5.12. First, moving to a hospital-wide readmission measure would decrease the number of penalized hospitals because the hospital-wide measure condenses all five domains into a single hospital-wide readmission measure. Under the condition-specific measures, each hospital can "win" or "lose" on each of the five measures independently, so the penalties are spread across a greater number of hospitals – some hospitals are penalized based on only one of the five conditions, while others might be in the "lose" category for three of five or even all five. However, under the hospital-wide measure, every hospital only has one chance to win or lose, concentrating the penalties.

Second, moving to a hospital-wide measure with the statutorily defined payment formula would significantly increase the dollar amount of penalties assessed because the current penalty formula is based on the proportion of all payments to a hospital made for excess readmissions for target conditions. Since the condition-specific measures comprise admissions that account for only approximately 15% of hospital payments, payments made for excess readmissions for these conditions add up to a relatively small dollar amount in total. However, the hospital-wide measure includes admissions that account for over half of hospital payments, so even for similar performance on the readmission measure, payments included in the penalty calculation would be much higher. Given this finding, each simulation applied a scaling factor to evaluate how the penalties would look if they were budget-neutral compared to the current program. A scaling factor of 45.8% was used to bring the total penalty dollars back to the level of current penalty dollars.

Table 5.12. Overall Impact of Moving to a Hospital-Wide Readmission Measure

	Current Penalty			Hospital-Wide Readmission Penalty			
	% of Hospitals Penalized	Penalty in Thousands of $	Penalty as % of Base DRG payment	% of Hospitals Penalized	Penalty in Thousands of $	Penalty as % of Base DRG payment	Penalty if Forced Budget Neutral in Thousands of $
All Hospitals	81%	$158	0.46%	47%	$355	0.86%	$162

3. Hospital-Wide Measure Without any Adjustment for Social Risk

Compared to the current condition-specific program, the hospital-wide measure would significantly increase the relative magnitude of penalties at safety-net hospitals versus non-safety-net hospitals (Table 5.13). Applying the current penalty formulas, safety-net hospitals' penalties would more than triple from $191,000 to $606,000 on average, compared to an increase from $150,000 to $294,000 for non-safety-net hospitals. With a scaling factor forcing the program to be budget-neutral, safety-net hospitals would still see an increase to $278,000 on average, while penalties would actually drop for non-safety-net hospitals (right-most column in Table 5.13).

Table 5.13. Results of Moving to a Hospital-Wide Readmission Measure

	Current Penalty			Hospital-Wide Readmission Penalty			
	% of Hospitals Penalized	Penalty in Thousands of $	Penalty as % of Base DRG payment	% of Hospitals Penalized	Penalty in Thousands of $	Penalty as % of Base DRG Payment	Penalty if Forced Budget Neutral in Thousands of $
All Hospitals	81%	$158	0.46%	47%	$355	0.86%	$162
SNH (top 20% of DSH)	87%	$191	0.48%	66%	$606	1.32%	$278
Non-SNH (all other)	81%	$150	0.45%	42%	$294	0.75%	$135

Thus, the disparity between safety-net and non-safety-net hospitals was exacerbated using the hospital-wide measure. In fact, under this measure, safety-net hospitals were penalized nearly twice as much both relatively and in absolute dollars as their non-safety-net counterparts.

Why should this be the case, given that the underlying relationships between social risk and readmissions were generally similar between the hospital-wide domains and the condition-specific groups? As noted above, the explanation lies in the fact that the hospital-wide measure concentrates penalties in a smaller number of hospitals; since safety-net hospitals tend to have higher readmission rates overall, they are significantly more likely to be in the penalized group. Additionally, because the penalties are more concentrated, they are higher at each penalized hospital, even under a budget-neutral scenario.

Given the finding that a hospital-wide measure would disproportionately penalize the safety-net to a significantly greater degree than the current program, the policy alternatives that might be combined with transition to a hospital-wide measure become even more important. Again, three main alternatives were evaluated: risk-adjustment, stratification, and rewarding improvement. The pros and cons of the approaches are addressed above (see Table 5.7).

4. Adjust Hospital-Wide Readmission Rates for Social Risk

Two versions of adjustment were simulated. In the first, adjusting for the impact of dual enrollment status at the patient level, penalties for safety-net hospitals (defined as those in the top 20% by the DSH Index) were reduced from an average of $606,000 under the hospital-wide option to $568,000, with very marginal changes for non-safety-net hospitals (Table 5.14). However, unlike adjustment to the condition-specific measures, a significant disparity in penalty remained under the hospital-wide measure, at least partially due to the more significant disparity in the penalties before adjustment.

Table 5.14. Results of a Hospital-Wide Penalty and Adjustment for Dual Enrollment Status

	Hospital-Wide Readmission Penalty				Hospital-Wide Readmission Penalty PLUS adjustment for dual enrollment only			
	% of Hospitals Penalized	Penalty in Thousands of $	Penalty as % of Base DRG Payment	Penalty if Forced Budget Neutral in Thousands of $	% of Hospitals Penalized	Penalty in Thousands of $	Penalty as % of Base DRG Payment	Penalty if Forced Budget Neutral in Thousands of $
All Hospitals	47%	$355	0.86%	$162	47%	$354	0.83%	$163
SNH (top 20% of DSH)	66%	$606	1.32%	$278	64%	$568	1.19%	$261
Non-SNH (all other)	42%	$294	0.75%	$135	43%	$302	0.75%	$139

Adjusting for rurality, ZIP code per-capita median income, and ZIP code average education further attenuated the differences between safety-net and non-safety-net hospitals. Penalties for safety-net hospitals were reduced on average from $606,000 under the hospital-wide option to $528,000, though large differences between safety-net and non-safety-net hospitals remained both in dollars and in percent penalty (1.12% versus 0.71%).

In sum, taking patient dual enrollment status or other socioeconomic variables into account would reduce but not eliminate the sizeable gap between safety-net and non-safety-net hospitals under a hospital-wide readmissions measure.

5. Stratify Hospitals when Applying a Hospital-Wide Readmission Measure

As with the condition specific penalties, ERRs were standardized within each stratum and penalties were assessed using the current HRRP penalty formula. As shown in Table 5.15, stratifying hospitals into two groups, safety-net and non-safety-net, using the top quintile of the DSH Index as the stratification cutoff, significantly reduced penalties for hospitals in the safety-net (from $606,000 to $398,000 on average) and significantly increased penalties for non-safety-net facilities. Stratifying hospitals into ten groups by decile of DSH index had a similar impact.

Table 5.15. Results of a Hospital-Wide Readmission Penalty and Stratification

	Hospital-Wide Readmission Penalty				Hospital-Wide Readmission Penalty PLUS Stratification into Two Groups			
	% of Hospitals Penalized	Penalty in Thousands of $	Penalty as % of Base DRG payment	Penalty if Forced budget neutral in Thousands of $	% of Hospitals Penalized	Penalty in Thousands of $	Penalty as % of Base DRG payment	Penalty if Forced Budget Neutral in Thousands of $
All Hospitals	47%	$355	0.86%	$162	47%	$358	0.88%	$162
SNH (top 20% of DSH)	66%	$606	1.32%	$278	43%	$398	0.77%	$180
Non-SNH (All Other)	42%	$294	0.75%	$135	49%	$348	0.91%	$158

Stratification was thus effective at redistributing penalties more evenly between safety-net and non-safety-net hospitals. Under a hospital-wide plus stratification approach, safety-net hospitals had higher penalties in dollars, but lower penalties in terms of percent of base DRG payments.

6. Reward Improvement on the Hospital-Wide Readmission Measure

Improvement, as described above, was modeled by giving hospitals a bonus equal to 50% of their improvement from the prior year. This option somewhat reduced penalties for hospitals in the safety-net (from $606,000 to $512,000 on average) and had a slightly lesser impact for non-safety-net facilities.

Table 5.16. Results of a Hospital-Wide Readmission Penalty and Improvement Bonus

	Hospital-Wide Readmission Penalty				Hospital-Wide Readmission Penalty PLUS Bonus for Improvement			
	% of Hospitals Penalized	Penalty in Thousands of $	Penalty as % of Base DRG payment	Penalty if Forced budget neutral in Thousands of $	% of Hospitals Penalized	Penalty in Thousands of $	Penalty as % of Base DRG payment	Penalty if Forced Budget Neutral in Thousands of $
All Hospitals	47%	$355	0.86%	$162	47%	$308	0.73%	$163
SNH (Top 20% of DSH)	66%	$606	1.32%	$278	66%	$512	1.08%	$270
Non-SNH (All Other)	42%	$294	0.75%	$135	42%	$259	0.64%	$136

In contrast to the condition-specific measure, the finding that rewarding improvement helped safety-net more than non-safety-net hospitals under this option suggests that safety-net hospitals may be improving at a faster rate on the hospital-wide metric. However, penalties for safety-net hospitals remained significantly higher than non-safety-net hospitals even with this added bonus.

VII. Key Findings, Strategies, and Considerations

A. Key Findings

- Underlying relationships
    - Dually-enrolled beneficiaries had significantly greater odds of readmission than non-dually-enrolled beneficiaries within hospitals, an effect that was relatively similar across hospitals.
    - There was also a significant hospital effect, suggesting that safety-net hospitals have other unmeasured differences in beneficiary characteristics, provide poorer-quality care to prevent readmissions, or face other barriers that might be related to the availability of resources or community supports.
- Program Impacts
    - Under the current risk adjusted readmission measures, the differences between hospitals' risk-standardized readmission rates were much smaller than the differences in raw readmission rates.
    - Thus, under the current program using the current risk-adjusted measures, the differences in penalties between safety-net and non-safety-net hospitals were small.
- Policy simulations
    - Under the current condition-specific program, direct adjustment for dual enrollment or stratifying hospitals by Disproportionate Share Hospital (DSH) Index and then assigning penalties by strata could significantly close the gap in penalties between safety-net and non-safety-net hospitals.
    - Rewarding within hospital improvement over previous years, though appealing philosophically, would not impact penalties for safety-net hospitals, even with a bonus for high DSH Index hospitals.
    - Under the current penalty formula, moving to a hospital-wide readmission measure would increase penalties for all hospitals. This would also increase the disparity in penalties between safety-net and other hospitals, both in absolute and relative terms.

B. Strategies and Considerations

Strategies and considerations are outlined below. They are, as in all program chapters in this report, organized into three broad strategies that best meet the policy criteria outlined in Chapter 1: 1) measure and report quality for beneficiaries with social risk factors; 2) set high, fair standards for all beneficiaries; and 3) reward and support better outcomes for beneficiaries with social risk factors.

STRATEGY 1: Measure and Report Quality for Beneficiaries with Social Risk Factors
Measurement and reporting are foundational for quality improvement in health care.

CONSIDERATION 1: Measure developers should develop readmission measures and/or statistical approaches suitable for reporting of performance for beneficiaries with social risk factors, where feasible.

Readmission rates stratified by social risk should be developed and considered for hospital preview reports and public reporting in places such as Hospital Compare, so that hospitals, health systems, policymakers, and consumers can see and address important disparities in care. This could include, for example, reporting readmission rates for dual and non-dual admissions for each hospital. In terms of the policy criteria, stratified public reporting may encourage poor performing provides to reduce disparities in quality and outcomes, and promotes transparency to facilitate consumer choice.

CONSIDERATION 2: Consider prospectively monitoring for potential unintended consequences. In particular, the cumulative penalties across the three hospital programs for providers that serve beneficiaries with social risk factors should be tracked.

Prospectively monitoring the financial impact of Medicare payment programs on providers disproportionately serving beneficiaries with social risk factors is critical as the programs continue to change. For the hospitals in particular, although penalties from a single program may be small, the additive penalties across all three programs may be significantly larger. Thus, monitoring should include financial consequences of the HRRP as well as cumulative performance across the hospital programs.

STRATEGY 2: Set High, Fair Standards for All Beneficiaries

Given the overarching goal of improving care for all beneficiaries, providers should be held to high, fair standards regardless of the beneficiaries they serve.

CONSIDERATION 1: Readmission measures used in the current program should continue to be examined to determine if adjustment for social risk factors is appropriate.

In terms of the HRRP penalties, the first question is whether anything should be changed at all. The differences in penalties between safety-net and non-safety-net hospitals are small under the current system; while MedPAC and others have raised concern about other technical elements of the program, the differences based on social risk may not be large enough to warrant intervention. Based on the analyses in this report, adjusting readmission rates for social risk would not result in a significant gain in assessing quality or providing consumer information. CMS reports excess readmission rates which are already adjusted for clinical factors associated with social risk, and thus further adjustment for current social risk measures such as dual status would not change providers' performance on the measures substantially.

Additionally, there is concern that adjusting the readmissions measures for social risk could mask disparities and, depending on how the adjustment were performed, excuse low-quality care on the part of some providers. However, either direct adjustment for dual enrollment or stratification by social risk would potentially make comparisons more equitable, particularly for the small group of hospitals serving very large proportions of dually-enrolled beneficiaries. Both of these strategies account for differences in social risk, but, in terms of the policy criteria, only direct adjustment adjusts only for the difference in performance related directly to dual enrollment, and both may risk inadvertently over-adjusting for factors within provider control, such as bias or discrimination. These options may discourage reductions

in disparities in quality and outcomes, as compared to the status quo, by reducing the financial impact if dually enrolled beneficiaries have higher readmission rates than other beneficiaries. Finally, penalties that result from adjusting for dual enrollment or stratifying hospitals may mask actual performance and reduce transparency.

On the other hand, the within-hospital differences between readmission rates for dually enrolled and other individuals are real and significant, and some portion of the effect may be outside the control of the hospital. Some may therefore feel that the program should be modified even if it would not lead to large changes in penalty assignments. That is, while the current program indirectly accounts for social risk to some extent by its correlation with health status, some policy makers may find a direct adjustment preferable. If any changes to the current program are pursued, continuous monitoring for unintended consequences would be necessary.

Study B will continue to study an expanded set of social risk factors to determine whether they would alter these findings.

CONSIDERATION 2: The use of a hospital-wide readmissions measure for the HRRP should be pursued in the long term, as included in the President's budgets for FY 2017 and FY 2016. However, the hospital-wide measure with the current penalty formula creates larger penalties among a smaller number of hospitals and disproportionately impacts the safety net. Therefore, changes to the penalty formula, or additional strategies such as stratification, should be pursued if this measure is implemented.

Given its broader potential impact and methodological advantages, as well as its symmetry with measures used in the ACO, outpatient, and post-acute settings, a hospital-wide readmissions measure should be adopted in the long term. The hospital-wide measure may be conceptually appealing because it is based on a single readmission rate, uses only one year of admissions to generate hospital wide rates, and incents improvement for a broader group of Medicare beneficiaries. In terms of the policy criteria, penalizing hospitals on readmission performance for a larger proportion of beneficiaries would encourage them to reduce disparities in quality and outcomes for all beneficiaries. Hospital-wide readmission measures are also a more accurate measure of overall hospital quality, and as such would promote transparency to facilitate consumer choice.

However, given the impact of the hospital-wide measure on the safety net as currently constructed, it should not be implemented without significant alteration either to the measure or the penalty formula. Because of the "win-lose" nature of the single hospital-wide measure and the greater proportion of dollars at risk, moving to this measure would increase penalties significantly and markedly for safety-net hospitals both in absolute and relative terms. Improvement of the characterization of medical risk may reduce the disproportionate burden on the safety net, and changes to the hospital-wide readmission measure could address this. Another option would be to change the penalty formula. Of the policy options considered (adjustment, stratification, and rewarding improvement), only stratification

ameliorated this disparity in any significant way. Therefore, if the current hospital-wide measure is pursued, one option would be to implement it under a stratified penalty scheme.

CONSIDERATION 3: Program measures should be studied to determine whether differences in health status might underlie the observed relationships between social risk and performance, and whether better adjustment for health status might improve the ability to differentiate true differences in performance between providers.

While the analyses in this report demonstrated disparities by dual enrollment in particular, they did not reveal the reasons for those disparities. Even after accounting for measurable comorbidities, beneficiary social risk factors, and hospital characteristics, beneficiaries at safety-net hospitals had a 5-10% increased likelihood of being readmitted, which represents about half of the increase in the raw rate. To the degree that the remaining disparity is due to differences in medical risk, functional status, frailty, or other factors beyond hospitals' control, all of which are more common in dually-enrolled populations, the measures could be made fairer by an improved accounting for these issues. To that end, further study should be undertaken to understand whether the readmission measures could be made more robust in terms of their ability to account for severity of illness, patient frailty, disability, or functional status; this will be a focus of Study B from this project as well. This is consistent with the policy criteria of adjusting only for the difference in performance related directly to the social risk factor and adjusting only for what is beyond providers' control, and would allow these to be achieved in the future.

STRATEGY 3: Reward and Support Better Outcomes for Beneficiaries with Social Risk Factors

One of the important findings in this chapter was the wide distribution of performance among providers disproportionately serving beneficiaries with social risk factors. This suggests that achieving better outcomes for these groups is feasible. However, in many cases it may require more effort on the part of providers, or more resources and more support, than achieving the same outcomes in a lower-risk population.

CONSIDERATION 1: Consider providing additional financial incentives for achievement of low readmission rates for beneficiaries with social risk factors.

Achievement and/or improvement in high-risk populations should be rewarded, and this could be done by adding targeted payment adjustments to existing value-based purchasing programs such as the HRRP. Such opportunities would also help counteract any disincentives under value-based or alternative payment models to caring for high-risk populations. This approach has the potential to provide further incentives for improvement for populations that currently have particularly poor outcomes, and to incent a reduction in disparities more broadly.

While such an adjustment would need to be developed and modeled, there are examples of how one could be constructed. The current Physician VM program, for example, provides an additional payment adjustment for physician practices that serve a high proportion of medically complex beneficiaries if

they meet the threshold for an upward payment adjustment – practices with highly complex beneficiaries can thus receive additional financial incentives for good performance. Such an adjustment could be mirrored for hospitals that serve a high proportion of beneficiaries with social risk factors. Alternatively, a payment adjustment that focused specifically on achieving high outcomes or significant improvement for beneficiaries with social risk factors, regardless of where they seek care, could focus attention and potentially spur innovation in thinking about ways to reduce readmissions in this group.

CONSIDERATION 2: Consider using existing or new quality improvement programs to provide targeted technical assistance for readmissions reduction to providers that serve beneficiaries with social risk factors.

It is also important to recognize that the raw rates of readmissions in beneficiaries with social risk factors are significantly and meaningfully higher than those for more advantaged populations, thus representing an important opportunity to improve clinical outcomes for these groups regardless of changes to the HRRP penalties. Indeed, reducing readmission rates at safety-net hospitals would be the most direct and lasting way to reduce the financial burden of the HRRP for these institutions.

Already, CMS' Quality Improvement Organizations (QIOs) and Quality Improvement Networks (QINs), Community-based Care Transitions Program, and the Partnership for Patients have separately worked to reduce readmissions. QIN-QIOs are taking a community approach to reduce readmissions by convening community providers and stakeholders to come together to improve the quality of care including transitions for the population of individuals that they serve in the community. These QIN-QIOs are existing resources that could coordinate efforts to disseminate best practices across hospitals and provide support for quality improvement initiatives going forward. A peer to peer program could pair higher performing facilities with poor performers to improve their quality of care. Alternatively, a new program, such as a readmission reduction collaborative, could focus specifically on reducing readmissions in low performing hospitals, safety-net hospitals, or all hospitals.

CONSIDERATION 3: Consider developing demonstrations or models focusing on care innovation that may help reduce readmissions for beneficiaries with social risk factors.

Beneficiary-directed programs could include consideration of demonstration projects aimed at dually-enrolled individuals, modeled on the successes found in Medicare Advantage plans that have focused on integrating benefits and supports across Medicare and Medicaid to support beneficiaries with social risk factors, or on efforts at increasing community engagement and connectivity such as CMMI's Accountable Health Communities.[2,31] Given that there is a growing body of evidence supporting care coordination, social work, visiting nurse, and patient engagement/self-management programs to help reduce readmissions,[32] these services could be explored for additional or enhanced coverage for appropriate groups. Finally, specialized services, such as the transitional care services provided by an outside entity in the Community-based Care Transitions Program, could be targeted either to

beneficiaries with social risk factors or poor performing hospitals.

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CHAPTER 6: The Hospital-Acquired Conditions Reduction Program

In This Chapter:

- ***Is there a relationship between beneficiary social risk and performance on the safety measures that comprise the Hospital-Acquired Conditions Reduction Program (HACRP)?***
- ***Is there a relationship between hospital social risk profile and performance on the safety measures that comprise the program?***
- ***Are hospitals that serve a high proportion of beneficiaries with social risk factors more likely to be penalized under the HACRP?***
- ***How would potential policy options to address issues of social risk and performance in the HACRP affect penalties?***

This chapter presents findings on the relationship between social risk and performance under the Hospital-Acquired Conditions Reduction Program (HACRP), and examines policy options for the HACRP:

Key Findings:

Underlying Relationships

- Both beneficiary social risk (dual enrollment, disability as the original reason for Medicare entitlement, and Black race) and hospital makeup (highest quintile of disproportionate share hospital (DSH) payments, beneficiaries with disabilities, or beneficiaries identified as Black) were associated with higher rates of patient safety events in the PSI-90 measure, suggesting both beneficiary and hospital factors contribute to patient safety events.

Program Impacts

- Safety-net hospitals (defined as those in the top quintile of DSH Index) and hospitals with a higher proportion of Black beneficiaries were more likely to be penalized under the HACRP.

Policy Simulations

- Risk-adjusting the PSI-90 measure for beneficiary social risk and/or unmeasured medical complexity had minimal impact on penalties, as the PSI-90 makes up only a small portion of hospitals' total score under the HACRP.
- Adjusting CDC's Hospital-Acquired Infection measures at the hospital level for DSH Index as a proxy for beneficiary social risk, and average HCC scores as a proxy for medical complexity, reduced the differences in penalty status between safety-net and non-safety-net hospitals.

- Stratifying hospitals into two groups (safety-net and non-safety-net) to determine penalties equalized the proportion of hospitals penalized by safety-net status.
- Restructuring the program to a linear penalty performance and basing penalty calculations on base DRG payments instead of total IPPS payments reduced the likelihood of penalties for the safety-net and reduced their average penalty dollars.
- Rewarding improvement had a limited impact on penalties.
- Changes to the program finalized by CMS in the FY 2017 Hospital Inpatient PPS Final Rule (81 Fed. Reg. 162), which include harms-based weighting in the modified PSI-90 and winsorized z-scores, are expected to lead to higher penalty rates for safety-net hospitals, but better reflect performance differences and the severity of harms from safety events.

Strategies and Considerations for the HACRP

SUMMARY OF STRATEGIES AND CONSIDERATIONS
STRATEGY 1: Measure and Report Quality for Beneficiaries with Social Risk Factors
CONSIDERATION 1: Consider enhancing data collection and developing statistical techniques to allow measurement and reporting of performance for beneficiaries with social risk factors on key patient safety and infection measures.
CONSIDERATION 2: Consider prospectively monitoring for potential unintended consequences of the HACRP; the cumulative penalties across the three hospital value-based purchasing programs should be tracked for hospitals that disproportionately serve beneficiaries with social risk factors.
STRATEGY 2: Set High, Fair Standards for All Beneficiaries
CONSIDERATION 1: Patient safety measures used in the current HACRP should continue to be examined to determine if adjustment for social risk factors is appropriate.
CONSIDERATION 2: The HACRP should be updated with AHRQ's revised PSI-90 measure, as CMS plans to do in FY2018.
CONSIDERATION 3: Consider restructuring the HACRP to minimize differential impacts on hospitals disproportionately serving beneficiaries with social risk factors and incent improvement along the continuum of performance by determining penalties using base DRG payments and using a linear penalty scale rather than a binary penalty, with a continuous scoring approach, as included in the President's FY 2016 budget.
CONSIDERATION 4: Program measures should be studied to determine whether differences in health status might underlie the observed relationships between social risk and performance, and whether better adjustment for health status might improve the ability to differentiate true differences in performance between providers. In particular, patient-level clinical data from the CDC healthcare associated infection measures should be examined and considered for risk adjustment. A long-term alternative would be to develop alternate safety measures such as all-harms measures using EHR data.
STRATEGY 3: Reward and Support Better Outcomes for Beneficiaries with Social Risk Factors
CONSIDERATION 1: Consider providing additional financial incentives for hospitals that achieve low patient safety event rates and/or infection rates among beneficiaries with social risk factors.
CONSIDERATION 2: Consider using existing or new quality improvement programs to provide targeted

technical assistance to providers that serve beneficiaries with social risk factors.
CONSIDERATION 3: Consider developing demonstrations or models focusing on care innovations to achieve low patient safety event rates and/or infection rates for beneficiaries with social risk factors.

I. Introduction

A. Background

The Hospital-Acquired Conditions Reduction Program (HACRP) is a Medicare pay-for-performance program focused on reducing the incidence of infections and other adverse safety events in U.S. hospitals. The program was created in Section 3008 of the 2010 Patient Protection and Affordable Care Act (ACA), and its first payment year was fiscal year (FY) 2015.

Hospitals' performance is quantified by the Total HAC Score, which reflects performance on various patient safety measures. Hospitals' Total HAC Scores are translated into financial penalties in the pay-for-performance program by identifying the 25 percent of hospitals with the worst scores. These hospitals are penalized a flat 1% on their total inpatient Medicare revenues, which includes base diagnosis-related group (DRG) payments as well as add-ons like disproportionate share hospital (DSH) payments and payments for medical education.

The Total HAC Score is based on hospital's performance on patient safety measures and healthcare associated infections in two domains. Domain 1 includes a composite measure of adverse patient safety events, called Patient Safety Indicators (PSI-90), developed by the Agency for Healthcare Research and Quality (AHRQ). Domain 2 includes healthcare associated infection measures developed by the Centers for Disease Control and Prevention (CDC), such as blood-stream associated infections. Domain 2 weighting increases over time, making healthcare associated infections the most important component of the program. Table 6.1 summarizes the domain weighting since the start of the program in FY2015.

Table 6.1. HAC Reduction Program Domain Weights, by Year

Domain Weights	HAC Reduction Program – Payment Year		
	FY15	FY16	FY17
Domain 1 (PSI-90 measures)	35%	25%	15%
Domain 2 (CDC infection measures)	65%	75%	85%

Domain 1, the patient safety domain, is comprised of a set of 8 claims-based patient safety indicators, reported together as the PSI- 90 composite measure. The PSIs represent a variety of events, ranging from accidental cuts and lacerations to post-operative hip fractures or collapsed lungs. Hospital performance is risk-adjusted for beneficiaries' medical comorbidities. The eight indicators are also weighted based on the volume of cases, so that hospitals' performance on the current PSI-90 composite measure mainly reflects relatively minor accidental punctures and lacerations, which are quite common (PSI-15 – weighted 49%) and serious blood clots after surgery (PSI-12 - weighted 26%, Table 6.2).

Table 6.2: Patient Safety Indicators and Composite Measure Weights (PSI-90 version 4.5)

PSI	Name	Meaning	Weight
PSI-3	Pressure Ulcer	Bedsores	2.3%
PSI-6	Iatrogenic Pneumothorax	Collapsed lung	7.1%
PSI-7	Catheter-Related Blood Stream Infection	Infection related to an intravenous line	6.5%
PSI-8	Postoperative Hip Fracture	Broken hip after surgery	0.1%
PSI-12	Perioperative Pulmonary Embolism or Deep Vein Thrombosis	Serious blood clot after surgery	25.8%
PSI-13	Postoperative Sepsis	Serious, widespread infection after surgery	7.4%
PSI-14	Postoperative Wound Dehiscence	Surgical wound that splits open after surgery	1.7%
PSI-15	Accidental Puncture or Laceration	Accidental cut sustained during surgery	49.2%

As noted above, in the FY2015 payment year, Domain 1 contributed 35 percent of the Total HACRP Score, but this will decrease by 10 percent each year, down to 15 percent in the FY2017 payment year.

Domain 2, the healthcare-associated infections domain, is comprised of Standardized Infection Ratios (SIRs) reported by hospitals to the Centers for Disease Control and Prevention (CDC) National Healthcare Safety Network (NHSN). These infections include catheter-associated urinary tract infections (CAUTI) and central-line associated bloodstream infections (CLABSI); in FY 2016 surgical site infection (SSI) for colon surgeries and abdominal hysterectomy were added to the domain. In subsequent years (FY2017 and onwards), rates of methicillin-resistant staph aureus (MRSA) and clostridium difficile (C. diff) infections will also be measured. These measures are collected at the beneficiary level, but reported to CMS and risk-adjusted at the facility level. The risk adjustment for the CDC measures includes facility-level characteristics such as ward type, teaching status, and hospital size.

As noted above, in the FY2015 payment year, Domain 2 contributed 65 percent of the Total HACRP Score, which will increase by 10% each year to 85% of the total score by FY2017.[1] (See the Appendix to this chapter for complete information on measures and domain weights by year.)

The CDC recently reported that between 2008 and 2013, CLABSI rates have decreased by 46%, and that there have also been reductions in MRSA infections (down by 8%), surgical site infections (down by 14% for hysterectomy and 8% for colon surgery), and C. difficile infections (down by 10%).[2] During that same time frame, CAUTI rates increased by 6% nationally. Since the HACRP program did not begin assessing penalties until FY 2015, there has not been sufficient time to observe if the program has led to further changes in these infection rates.

Despite these findings, early experience with the HACRP has demonstrated that teaching hospitals, hospitals that serve a medically complex population (defined as those in the highest quartile of hospitals' case mix index, a measure of medical complexity), and safety-net hospitals (defined as those in the highest quintile of DSH index) were more likely to be penalized under the current program. This

has raised concern that the HACRP might be disproportionately affecting hospitals that care for sicker beneficiaries and / or beneficiaries with social risk factors.[3]

The question, of course, is whether these differences in performance are due to differences in underlying population that may be beyond hospitals' control, or whether differences in performance are due to hospital factors, such as infection control practices. This chapter outlines research findings on the relationship between beneficiary and hospital social risk and performance under the HACRP, presents a set of policy options to address any identified disparities, and simulates potential policy options to predict how they would impact hospitals that disproportionately serve socially high-risk beneficiaries.

B. Existing Research on Differences in Patient Safety Events Related to Social Risk

It is well-proven that higher levels of medical risk are associated with a higher risk for many (though not all) patient safety events, particularly infections. For example, diabetes is associated with roughly 70% higher odds of surgical site infections;[4] and diabetes, pulmonary disease, renal failure, and exposure to nursing homes are associated with a higher risk of MRSA.[5] Many of the same medical factors also confer a higher risk of C. diff infection,[6] as well as CAUTI[7] and CLABSI.[8]

The relationship between social risk and patient safety events, however, is more controversial. Studies have demonstrated that social risk and patient safety events are related: for example, one recent study, using National Inpatient Sample data, examined within-hospital effects and showed that PSIs were more common in poor, Medicaid patients.[9] Another study found that in stroke patients, both PSIs and hospital-acquired infections were more likely in Medicaid than privately insured patients, even within the same hospitals.[10]

However, the mechanism by which this takes place is poorly understood. There is minimal evidence that social risk factors are directly causative of patient safety events; however, mechanisms have been postulated for what may underlie this relationship. There are three main pathways by which social risk might be related to patient safety events: medical risk, social risk, and hospital quality. These are outlined in the conceptual model below, and each pathway is discussed in the paragraphs that follow:

Figure 6.1 Conceptual model of relationship between beneficiary social risk and risk of inpatient safety events or healthcare associated infections

The first potential pathway, in which social risk is related to outcomes via higher levels of medical risk, is one possible explanation for the observed higher patient safety event rates in beneficiaries with social risk factors, though direct evidence is lacking. Factors such as diabetes, pulmonary disease, renal failure, immunodeficiency, and exposure to nursing homes are all more common in the poor, and as noted above, are related to a higher risk of MRSA,[5] C. diff infection,[6] CAUTI[7] and CLABSI.[8] Similarly, studies have shown that poverty is related to MRSA colonization,[11] likely through differential risk of exposure to health care settings and close living quarters. Little is known about race and ethnicity and safety events, although Black race and Hispanic ethnicity are associated with both a higher likelihood of diabetes and worse diabetic control[12] – and as noted above, diabetes is associated with much higher odds of surgical site infections.[4] Functional status is another important potential confounder: impaired functional status is associated with a higher risk of infection,[13] and beneficiaries with social risk factors are more likely to have functional limitations. However, since such data are generally not available in large-scale assessments of hospital performance, it is impossible to assess the degree to which this is applicable.[14,15]

Many clinical risk-adjustment models simply count comorbid conditions appearing on claims and inadequately assess severity of these comorbid conditions; they also do not incorporate a beneficiary's functional status. Furthermore, beneficiaries with social risk factors may have unmet health needs that are not fully captured on claims. Unmeasured medical risk therefore may be masquerading as social risk, and therefore better assessment of clinical comorbid conditions and health status that are co-related with social risk could improve the validity and fairness of risk-adjustment methodologies used in patient safety measures. However until medical complexity can be adequately captured, beneficiary social risk may be acting as a proxy marker of medical complexity.

The second potential pathway, factors related to social risk itself, is even less well-understood. There are no data suggesting direct causation here, though again researchers have postulated how these

associations might arise. For example, providers could have biases against beneficiaries with social risk factors that place these beneficiaries at greater risk of healthcare associated infections, such as through shared rooms or higher inappropriate use of catheters, though there is little direct evidence to suggest this takes place.[16,17] Poor patient-provider communication may be another contributor to adverse events in beneficiaries with social risk factors: one study found that patients with limited English proficiency had higher rates of adverse safety events in the inpatient setting.[18]

The third potential pathway, factors related to hospital quality, suggests that beneficiaries with social risk factors may have higher rates of patient safety events because they seek care at hospitals that, on average, provide lower-quality care in this area. Again, the evidence here is largely conjectural. Safety-net hospitals have, on average, lower nurse staffing levels,[19] which has been shown to be associated with higher rates of urinary tract infection and other adverse events.[20] For example, one study found that higher nurse-patient ratios were associated with a greater than 30% reduction in infection risk and estimated that a quarter of infections could be prevented with higher staffing ratios.[21] Less is known about hospital infection control or patient safety strategies and safety-net status, though reports suggest that infection control staffing levels are inadequate nationally.[22]

Finally, a number of published studies show the efficacy of interventions in reducing the incidence of adverse events, particularly CLABSI and CAUTI, and proponents of the program argue that these successes indicate that medical or social risk need not be taken into account with these programs in place. For example, a recent study by AHRQ found that implementing a comprehensive unit-based safety program (CUSP) in a cohort of over 800 hospitals reduced CAUTI by 6-16% (from roughly 2.5 to 2.1 infections per 1,000 catheter days).[23] A similar study implemented CUSP in over 350 hospitals nationwide and found approximately 35% reduction in CLABSI rates (from 1.8 to 1.2 infections per 1,000 central line days),[24] demonstrating bloodstream infection rates can be reduced through effective hospital infection control programs.

The conceptual model presented highlights the challenges in considering whether to account in any way for the relationship between social risk and patient safety events when judging hospital performance. On one hand, adjusting patient safety measures for beneficiary social risk or hospitals' share of these patients could excuse poor performance that can partly be attributed to and addressed by the health care system. On the other hand, hospitals that disproportionately serve beneficiaries with social risk factors may appear to perform more poorly because their patients are more likely to have medical complexity that is not accounted for in performance measures.

C. Limitations

This chapter examines patterns of performance based on beneficiary social risk using dual enrollment as a proxy for individual poverty, and Census-based information on neighborhood characteristics, as well as others risk factors such as race and ethnicity and rural location. While this chapter explores some policy options based on adjustment for dually-enrolled beneficiaries, it does not include policy options based on adjustment for individual patients' race and ethnicity or rural location. Because racial and ethnic

disparities in patient safety may be due to bias or lower vigilance among healthcare professionals, adjusting for within-hospital patient differences due to race or ethnicity could mask important disparities in care.

Analyses on rural hospitals should also be taken with the caveat that they do not include Critical Access Hospitals or other special designation rural facilities located in more isolated rural areas. This is because the majority of rural hospitals are not paid under the Inpatient Prospective Payment System (IPPS) and are thus ineligible for the HACRP.

Analyses of the HACRP were also limited to hospital-level data for the CDC components of the HACRP, since most of these measures are not collected at the patient level but rather submitted at the hospital ward level. As a result, the relationship between a beneficiary's individual social risk status and patient safety outcomes in this domain could not be assessed directly.

Finally, although the analyses in this chapter utilize the most recent available data and focus on current program requirements, they may not predict future performance, especially as program requirements and measure specifications evolve. In particular, this chapter attempts to address three major changes that may impact the HACRP in coming years:

1) First, at the time of this study, the HACRP had a scoring approach that assigned penalties not based on a continuous score, but rather using decile-based scoring – so, for example, both a hospital at the 22nd percentile of performance and one at the 29th percentile of performance would receive a score of "3." This approach reduces information from performance rates and may group together hospitals with wide differences in performance into a single score group, leading to unusual "ties." CMS has recognized concerns about this approach and has re-evaluated the program's scoring methodology. Instead of decile scoring, CMS plans to use continuous scoring or z-scores in the HACRP starting in FY2018; therefore it is included in the policy options section for evaluation.

2) The measures that comprise the HACRP are also undergoing change. AHRQ, the measure steward for the PSI-90, has added three new component measures (PSI-9, postoperative hemorrhage; PSI-10, postoperative physiologic and metabolic derangement; and PSI-11, postoperative respiratory failure). AHRQ has also removed CLABSI (PSI-07), and will incorporate harm- and volume-based weights for version 6 of the Modified PSI-90 measure; these changes were endorsed by the National Quality Forum (NQF) in December 2015, and CMS has adopted this new version of the measure starting in FY2018. The revised weighting scheme incorporates the risk of serious harm (readmission, death) to a beneficiary rather than weighting all events equivalently. The harms-based and volume-based weighting updates are also included in the policy options section.

3) Lastly, there is a small numbers problem for many hospitals in the program. Because many of the measures in the program are focused on specific procedures or wards (e.g., intensive care units), nearly one-third of hospitals in FY 2015 did not have sufficient cases to report the two CDC infection measures and therefore relied entirely on the PSI-90 measure to determine program score and

ranking. CMS has a number of potential fixes for this issue (see 81 Fed. Reg. 56761). For FY 2017, it will introduce MRSA and C. diff measures into the program that are relevant to all inpatients and in FY2018 it will broaden the CLABSI and CAUTI measures to non-ICU locations, which may improve small hospitals' ability to participate in this program component; however, these data were not available at the time of analysis (2015 rates that include non-ICU locations will be published by October 2016) and thus are not reflected in the policy options presented here.

D. Framework for the Chapter: Analytic Findings, Policy Simulations, Strategies, and Considerations

The remainder of this chapter is structured as follows. First, it describes underlying relationships between social risk and performance on the measures that comprise the HACRP. Next, it examines the performance of hospitals serving beneficiaries with social risk factors on these measures, and then the performance of these hospitals under the HACRP penalty calculations. Next, it outlines and simulates a set of potential policy options, including adjustment, stratification, rewarding improvement, and moving to linear penalty scales. Finally, strategies and considerations for HACRP are presented, using the strategic framework outlined in Chapter 1: 1) measure and report quality for beneficiaries with social risk factors; 2) set high, fair standards for all beneficiaries; and 3) reward and support better outcomes for beneficiaries with social risk factors. These three strategies build on each other to address social risk in Medicare payment programs.

II. Beneficiary and Provider Characteristics

A. Beneficiary Characteristics

Beneficiary characteristics are presented below for the group of beneficiaries eligible for the PSI-90 patient safety measures. About one third are dually enrolled in Medicaid and Medicare (includes both enrollees with full and partial benefits), 30% are beneficiaries who initially qualified for Medicare based on the presence of a disability. 17% live in areas in the bottom 20% of median ZCTA-level income and 21% live in rural areas (defined as non-metropolitan statistical areas). Beneficiaries of Black race make up 13%, and Hispanic beneficiaries make up 6% of all inpatient stays. There is significant overlap between social risk groups; for example, almost 53% of dually-enrolled beneficiaries also initially qualified for Medicare on the basis of a disability. Table 6.3 shows beneficiary characteristics overall and by social risk group:

Table 6.3: Beneficiary Characteristics by Social Risk Group

Beneficiary Characteristics	All	Dual	Originally entitled to Medicare on the basis of a disability	Black	Hispanic	Low-Income ZCTA	Rural
N Stays	66,544,522	21,590,426	20,320,953	8,498,248	3,811,703	11,534,119	14,112,050
% of All Stays	100.0%	32.4%	30.5%	12.8%	5.7%	17.3%	21.2%
% Male	44.7%	39.3%	49.2%	42.8%	45.3%	44.5%	45.8%
Mean Age	72.4	71.6	70.6	70.6	70.4	71.6	72.2
% Dually-enrolled	32.4%	100.0%	56.1%	58.4%	64.0%	49.3%	33.5%
% Originally entitled to Medicare on the basis of a disability	30.5%	52.8%	100.0%	49.0%	37.8%	41.4%	33.3%
% Black Race	12.8%	23.0%	20.5%	100.0%	0.0%	29.9%	8.3%
% Hispanic Ethnicity	5.7%	11.3%	7.1%	0.0%	100.0%	10.2%	2.4%
% Low Income ZCTA	17.4%	26.5%	23.6%	40.8%	31.2%	100.0%	28.9%
% Rural	21.3%	22.0%	23.2%	13.8%	8.8%	35.2%	100.0%
% High Complexity*	20.0%	28.8%	26.9%	28.7%	23.1%	22.9%	17.4%

*High complexity is defined as the highest 20% of total Hierarchical Condition Category (HCC) risk score. ZCTA=ZIP code tabulation area.

B. Provider Characteristics

Table 6.4 shows the beneficiary populations and structural characteristics of hospitals in the HACRP for all participating hospitals as well as for hospitals who disproportionately serve beneficiaries with social risk factors. Hospitals with the highest quintile (20%) share of beneficiaries with social risk factors are displayed in the table: high-DSH (top 20% share of DSH Index), high-disabled, high-Black, or high-Hispanic. Low-income ZCTA hospitals are those in the bottom 20% of median ZCTA-level income within the Hospital Service Area. Rural hospitals are those which are located outside metropolitan statistical areas (MSAs).

Safety-net hospitals (top 20% share of DSH) serve a group that is much more often dually-enrolled, qualified for Medicare on the basis of a disability, and of minority race and ethnicity, but less often rural. These hospitals are more likely to be larger (300+ beds), major teaching institutions, publicly funded, and located in the South and West.

Table 6.4: Hospital Characteristics by Social Risk Group

Hospital Characteristic	All	Safety-Net (High-DSH)	High-Disabled	High-Black	High-Hispanic	Low Income ZCTA*	Rural (non-MSA) Hospital
Beneficiary Population							
% Dually-enrolled	32.4%	48.5%	46.7%	39.8%	43.8%	44.9%	36.6%
% Originally entitled to Medicare on the basis of a disability	30.5%	36.8%	43.7%	36.2%	30.5%	39.0%	33.3%
% Black Race	12.8%	22.6%	21.7%	34.4%	13.4%	23.9%	8.5%
% Hispanic Ethnicity	5.7%	14.1%	4.0%	4.3%	22.4%	10.0%	2.2%
% Low Income ZCTA	17.4%	28.4%	39.8%	29.4%	19.6%	54.5%	27.7%
% Rural	21.3%	17.5%	44.8%	19.3%	7.4%	40.3%	78.3%
% High Complexity	20.0%	23.0%	21.4%	22.5%	23.0%	21.1%	17.8%
Structural Characteristics							
Number of Hospitals	3222	650	621	628	616	582	651
Size: Large (300+ Beds)	23.8%	36.9%	15.5%	35.5%	31.7%	18.7%	22.1%
Size: Medium (299-100 Beds)	42.9%	41.1%	42.4%	37.6%	44.2%	40.5%	45.5%
Size: Small (99-0 Beds)	32.2%	22.0%	40.7%	25.5%	23.1%	40.2%	31.6%
Teaching Hospital	8.4%	20.0%	6.4%	17.6%	12.4%	8.0%	8.6%
Ownership: Non-profit	58.5%	48.2%	41.2%	48.4%	48.9%	41.8%	61.0%
Ownership: For-profit	25.6%	26.9%	31.6%	26.0%	32.3%	30.6%	20.6%
Ownership: Public	15.9%	24.9%	27.2%	25.6%	18.8%	27.7%	18.4%
Safety-net (Top Quintile DSH)	20.2%	100.0%	38.2%	42.7%	51.0%	41.8%	29.5%
Region: Northeast	15.3%	14.0%	7.1%	10.2%	10.7%	4.6%	24.0%
Region: South	40.1%	44.9%	64.9%	61.8%	32.3%	70.4%	33.9%
Region: Midwest	23.1%	11.2%	14.7%	16.2%	6.2%	14.8%	29.0%
Region: West	18.6%	28.5%	9.5%	7.0%	48.1%	7.0%	10.4%
Average Case Mix Index	1.52	1.50	1.34	1.49	1.57	1.36	1.39

DSH=disproportionate share index; MSA=metropolitan statistical area; ZCTA=ZIP code tabulation area.
*Low-income ZCTA hospitals are in the bottom 20% of median ZCTA-level income within the Hospital Service Area.

III. Beneficiary Social Risk and Performance on the HACRP Patient Safety Metrics

The first research question was whether there was a relationship between social risk factors and performance on the HACRP patient safety metrics, using the PSI-90 composite measure calculated from claims data. Beneficiary-level data was examined to determine whether there were differences in performance by social risk, and if so, whether these were primarily within-hospital versus between-hospital effects. These analyses were limited to the PSI metrics where beneficiary data are available.

A. Individual Social Risk and PSI Events

Within-hospital disparities based on patients' social risk were examined for each of the eight PSI metrics individually as shown in Table 6.5. The first column of the table presents unadjusted odds of an event, representing the overall odds for dually-enrolled versus other beneficiaries. In the next column the clinically risk-adjusted odds are displayed, which take into account medical factors that might increase the odds of an adverse outcome (for example, age, primary diagnosis, etc.; for details on the specific risk adjustment factors included for each PSI, please see the Appendix to this chapter). Finally, results from random-effects regression models (with the clinical risk-adjustment for each measure) are displayed in the third column; these models help isolate the effect of an individual beneficiary's social risk to within-hospital only, i.e., whether dually enrolled Medicare beneficiaries within a hospital are at greater risk of a patient safety event than a non-dual in the same hospital, after adjusting for clinical factors. In these analyses, dually-enrolled beneficiaries had a higher risk for four of the eight PSI-90 indicators. However, on the two measures (PSI-12 and PSI-15) with the highest weighting in the current composite, dually enrolled beneficiaries were equally or less likely to sustain an event (Table 6.5):

Table 6.5: Social Risk and PSI Measure Performance, Dually-Enrolled Versus Non-Dually-Enrolled

Measure	Unadjusted Odds of Event for Dually-Enrolled	Risk-Adjusted Odds of Event for Dually-Enrolled	Risk-Adjusted Within-Hospital Odds of Event for Dually-Enrolled
PSI-3: Pressure Ulcer	**1.13**	**1.15**	1.06
PSI-6: Iatrogenic Pneumothorax	**0.84**	**0.93**	**0.92**
PSI-7: Catheter-Related BSI	**1.67**	**1.36**	**1.36**
PSI-8: Postop Hip Fracture	**1.33**	1.32	**1.33**
PSI-12: Periop PE or DVT	0.98	**0.91**	**0.91***
PSI-13: Postop Sepsis	**1.30**	**1.18**	**1.17**
PSI-14: Postop Wound Dehiscence	**1.45**	**1.39**	**1.37**
PSI-15: Puncture or Laceration	**0.68**	1.01	0.99

BSI=bloodstream infection; DVT=deep vein thrombosis; PE=pulmonary embolism. Odds ratios greater than 1 indicate greater risk of events; odds ratios less than 1 indicate lower risk. All bolded comparisons significant at $p<0.05$. *Random effects model did not converge due to small numbers for covariates; logistic model was used instead.

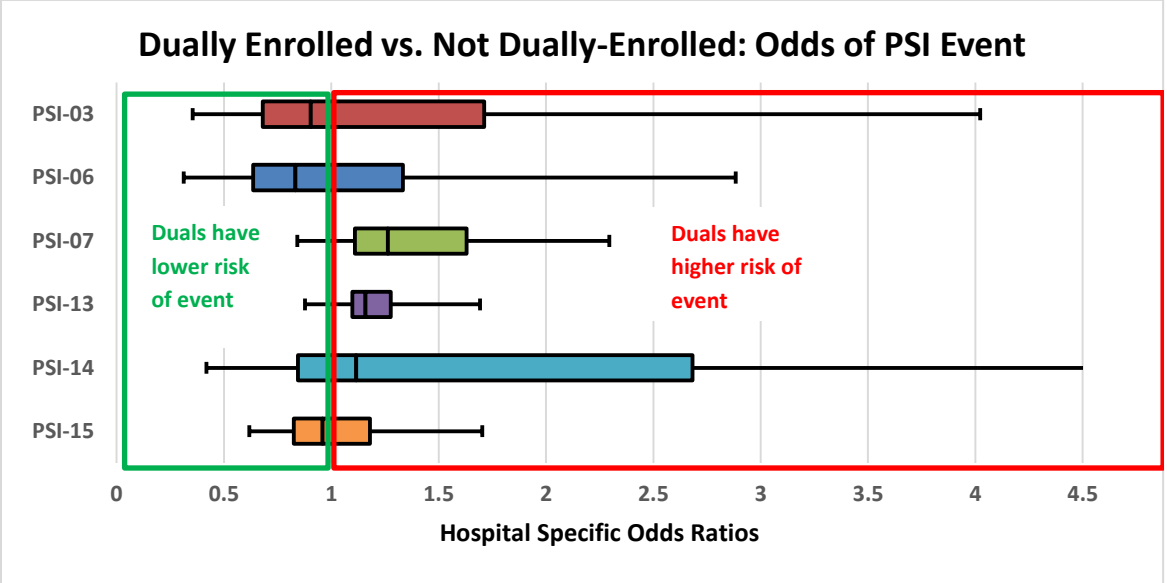
Results were similar for beneficiaries with disabilities and Black beneficiaries (three of eight measures with higher odds of an event and one or two measures with lower odds of an event, respectively);

however, Hispanic and rural beneficiaries fared better (two of eight measures with lower odds of an event and only one measure with higher odds of an event; see the Appendix to this chapter for full results).

B. Consistency of Effect of Social Risk Factors Across Hospitals

Next, models were constructed to determine whether the "within-hospital" effect of a beneficiary's dual enrollment on the risk of patient safety events was similar across hospitals. Odds ratios that are very consistent among hospitals might suggest a more "fixed" relationship between the predictor and the outcome. Odds ratios that are widely divergent among hospitals might suggest less of a clear relationship. To examine this issue, random effects regression models that calculated the difference between the odds of having an adverse safety event for dually-enrolled and non-dually-enrolled individuals within each hospital were used. The range of these odds ratio results across hospitals are shown in Figure 6.1 below. Note PSI-8 and PSI-12 are not shown due to issues with models converging due to small numbers of patients with certain clinical risk factors.

Figure 6.1: Variability of Dual Effect (Odds of PSI Event) Across Hospitals



The boxes for each measure represent the odds of a dual having a PSI event at the 5th and 95th percentile of all hospitals. The vertical bar is the median odds ratio; the whiskers are the minimum and maximum values.

There was wide variability among hospitals on most PSI-90 components. However, for the two infection measures, PSI-7 (CLABSI) and PSI-13 (post-operative sepsis) 95% of hospitals had an odds ratio above 1, and the dual effect on higher risk of infections was relatively consistent.

Similar box plots were constructed to examine the variability in the effect of having a disability across hospitals. Findings were similar, with wide variability across measures, and the most consistent odds ratios for the infection measures, PSI-7 (CLABSI) and PSI-13 (post-operative sepsis). This finding suggests that medically vulnerable beneficiaries, especially dually-enrolled beneficiaries or those with disabilities,

might face increased susceptibility to healthcare-associated infections (see the Appendix to this chapter for full results).

IV. Hospital Levels of Social Risk and Performance on the HACRP Patient Safety Metrics

A. Hospital Characteristics and PSI Events

Models were constructed to test the relationship between being admitted to a safety-net hospital and having a PSI event, irrespective of individual social risk. The primary predictor is being admitted to a safety-net hospital, as defined by being in the highest quintile of DSH payments. Results are shown in Table 6.6, where the odds refer to all patients in the safety-net hospital, whether those individuals themselves are at socially at-risk or not. Again, first the unadjusted odds of an event are displayed, then the odds with clinical risk-adjustment for the PSI component measure. Analyses showed that beneficiaries at safety-net hospitals had higher odds of an event for six of the eight PSIs, both before and after clinical risk adjustment, although risk-adjustment slightly lowered the effect.

Table 6.6: PSI Measure Performance, Safety-Net Versus Non-Safety-Net Hospitals

Measure	Unadjusted Odds of Event for Patients at Safety Net Hospitals (top 20% DSH)	Risk-Adjusted Odds of Event for Patients at Safety Net Hospitals (top 20% DSH)
PSI-3: Pressure Ulcer	**1.45**	**1.36**
PSI-6: Iatrogenic Pneumothorax	**1.18**	**1.13**
PSI-7: Catheter-Related BSI	**1.49**	**1.22**
PSI-8: Postop Hip Fracture	0.94	0.94
PSI-12: Periop PE or DVT	**1.17**	**1.09**
PSI-13: Postop Sepsis	**1.26**	**1.17**
PSI-14: Postop Wound Dehiscence	**1.19**	**1.19**
PSI-15: Puncture or Laceration	1.07	1.05

BSI=bloodstream infection; DVT=deep vein thrombosis; PE=pulmonary embolism. Odds ratios greater than 1 indicate increased risk of event; odds ratios less than 1 indicate reduced risk. All bolded comparisons are significant at $p<0.001$.

Results were similar but less striking when hospitals in the highest quintile of each of the other beneficiary social factors were examined: beneficiaries in high-disabled hospitals faced higher risks of a patient safety event (two of eight higher, one lower), as did those in hospitals that served more Black beneficiaries (three of eight higher, one lower), and hospitals that served more Hispanic beneficiaries (four of eight higher, none lower). However, beneficiaries at rural hospitals fared better than their urban counterparts (no measures with higher odds, and three measures with lower odds, of an event) (see the Appendix to this chapter for full results).

B. Comparison of Individual Beneficiary versus Hospital Social Risk Factor on PSI Events

Finally, models were constructed to test the independent effects of beneficiary versus hospital factors on PSI events. Each individual social risk factor was paired with its hospital equivalent (for example, individual dual enrollment status with hospitals with high share of duals) in a single random effects model, an approach that also addressed the potential for residual confounding by hospital proportion of beneficiaries with social risk factors and thus provided the best estimate of the within-hospital effect. These analyses showed that beneficiary social risk and a hospital's safety-net status independently contributed to an individual's risk of having a safety event. After adjusting for safety-net status, dually enrolled beneficiaries still had higher odds for four of the eight PSIs, and after adjusting for beneficiary's dual-enrollment status, safety-net hospitals still had higher odds for four of the eight PSIs (Table 6.7):

Table 6.7: Relationships with PSI-90 Components: Patient Social Risk (Duals) and Safety-Net Hospital Status in Single Model

Measure	Beneficiary Effect Odds Ratio: Dually-Enrolled vs. Not (within-hospital effect), Controlling for Hospital Safety-Net Status	Hospital Effect Odds Ratio: Safety-Net vs. Non-Safety-Net, Controlling for Beneficiary Dual Enrollment Status
PSI-3: Pressure Ulcer	**1.16**	**1.35**
PSI-6: Iatrogenic Pneumothorax	0.98	**1.17**
PSI-7: Catheter-Related BSI	**1.31**	**1.23**
PSI-8: Postop Hip Fracture	1.37	0.89
PSI-12: Periop PE or DVT	0.97	1.09
PSI-13: Postop Sepsis	**1.35**	**1.18**
PSI-14: Postop Wound Dehiscence	**1.54**	1.16
PSI-15: Puncture or Laceration	1.02	1.08

Beneficiary effect model includes hospital random effects, beneficiary dual status, and hospitals with high share of duals to estimate the "within-hospital" effect of beneficiary social risk. BSI=bloodstream infection; DVT=deep vein thrombosis; PE=pulmonary embolism. Odds ratios greater than 1 indicate increased risk of event; odds ratios less than 1 indicate reduced risk. All bolded comparisons are significant at $p<0.001$.

Thus, the beneficiary effect and hospital effect were largely independent of each other, yet both conferred significantly higher risk for a number of events. This finding suggests that both beneficiary characteristics and hospital practices contribute to the observed rates of patient safety events. Findings were mixed across the PSI components for the other social risk factors examined (see the Appendix to this chapter).

C. Hospital Social Risk Levels and Relationship with CDC Infection Ratios

Domain 2 of the HACRP includes the CDC's healthcare associated infection (HAI) measures which assess rates of laboratory-confirmed infections among all at-risk patients (not just Medicare beneficiaries). Since adults 18 years and older are included in these measures, hospitals with a highest quintile share of Medicaid and Medicare patients based on the DSH Index is used to identify safety-net hospital status,

instead of high proportion of dually-enrolled beneficiaries for the Medicare-only PSI-90 measure. Because infection rates are collected, adjusted, and reported only at the ward and hospital level, and not at the patient level, beneficiary-level analyses of infection rates under the CDC measures were not feasible. However, infection rates could be compared by hospital type, as shown below. The CDC's healthcare associated infection measures are reported as a standardized infection ratio (SIR), which compares a hospital's rates against a national average rate measured by CDC in the baseline period. Ratios below 1 mean the hospital did better than the national average in the baseline period; ratios above 1 mean the hospital has a higher infection rate than the national average.

Although safety-net hospitals (top 20% DSH) scored below 1 on central line associated blood stream infections [CLABSI] and Clostridium Difficile [C. diff], indicating that these infection rates in these two areas have improved since 2012, their rates for catheter associated urinary tract infections [CAUTI], surgical site infections [SSI], and methicillin-resistant staphylococcus aureus [MRSA] remain above current national averages. In addition, safety-net hospitals performed worse than non-safety-net hospitals on four of the five measures that are or soon will be included in the HACRP program (Table 6.8). However, without patient-level data it is not possible to tell whether the higher rates observed in safety-net hospitals are due to patterns in the underlying patient population, to lower-quality care and poorer infection control at safety-net hospitals, or, as suggested by the PSI infection measures, both.

Table 6.8: Hospital Social Risk and CDC Infection Ratios

Measure	Safety-Net Hospital (top 20% DSH)	Non-Safety-Net Hospital	Difference (Safety-Net Minus Non-Safety-Net)
CLABSI	**0.65**	**0.52**	**0.13**
CAUTI	**1.02**	**0.93**	**0.08**
Surgical Site Infection†	**1.05**	0.99	**0.04**
MRSA infection‡	**1.05**	**0.88**	**0.17**
Clostridium Difficile infection‡	**0.69**	**0.81**	**-0.12**

Lower CDC standardized infection ratios represent better care.
CLABSI=central-line associated bloodstream infection; CAUTI=catheter-associated urinary tract infection; MRSA=methicillin-resistant staphylococcus aureus.
All bolded comparisons are significant at p<0.01.
†Part of the HAC program starting in FY 2016, combines colectomy and hysterectomy rates
‡Part of the HAC program starting in FY 2017

Similar patterns were seen for hospitals in the highest quintile for beneficiaries with disabilities as well as for Black, and Hispanic beneficiaries; these hospitals had worse rates for at least one to two of the five healthcare-associated infection measures. However, rural hospitals had better performance on these infection rates than urban hospitals, with at least two measures statistically better and none worse than urban hospitals (see the Appendix to this chapter for full results).

V. Impact of the HACRP on Safety-Net Hospitals

As noted above, the metrics assessed under the HACRP are combined into two domains, with Domain 1, which includes the PSIs analyzed above, accounting for 25% of the overall score in FY 2016 and Domain 2, comprising the three CDC measures (CLABSI, CAUTI, and SSI) in FY 2016, for the remaining 75%; in FY2015 Domain 1 made up 35% and Domain 2 made up 65% of the overall score. Performance under these domains was examined for the hospital types of interest. To be consistent with program methodology, hospitals' measure performance was then translated into scores based on their decile ranking, with a score of 1 indicating the lowest rates of patient-safety event and infections, and 10 the highest, so that higher scores represented *worse* performance.

The impact of the HACRP are shown for the most recently available year, FY2016, but findings are similar for FY2015, the first year of the program. Figure 6.2 shows the distribution of the FY 2016 Total HAC Score (scored in deciles) by deciles of DSH Index. There is a trend towards higher (worse) Total HAC Scores (more red in the figure) as hospitals' DSH Index increases (to the right of the figure.

Figure 6.2 Distribution of Total HAC Scores by DSH Deciles

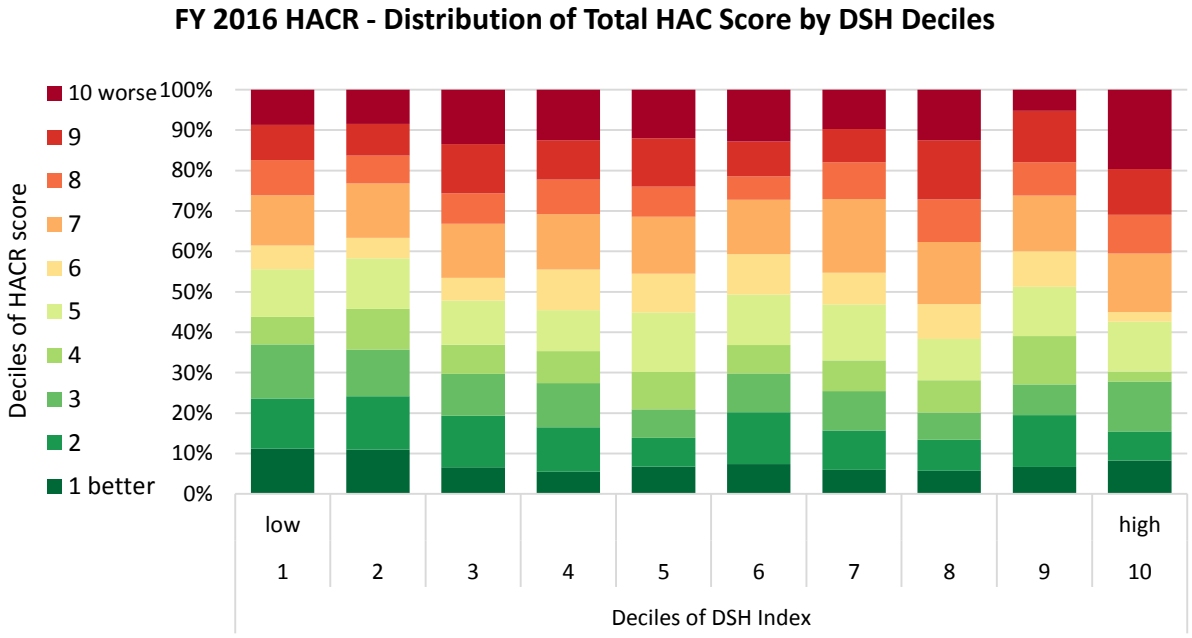


Figure 6.3 shows the distribution in a different way, but similarly demonstrates that safety-net hospitals (top 20% DSH Index, in red) are more likely to have higher Total HAC Scores, and therefore more likely to penalized as they fall above the penalty threshold.

Figure 6.3. FY 2016 Total HAC Score in safety-net hospitals (top 20% DSH) vs. all other hospitals

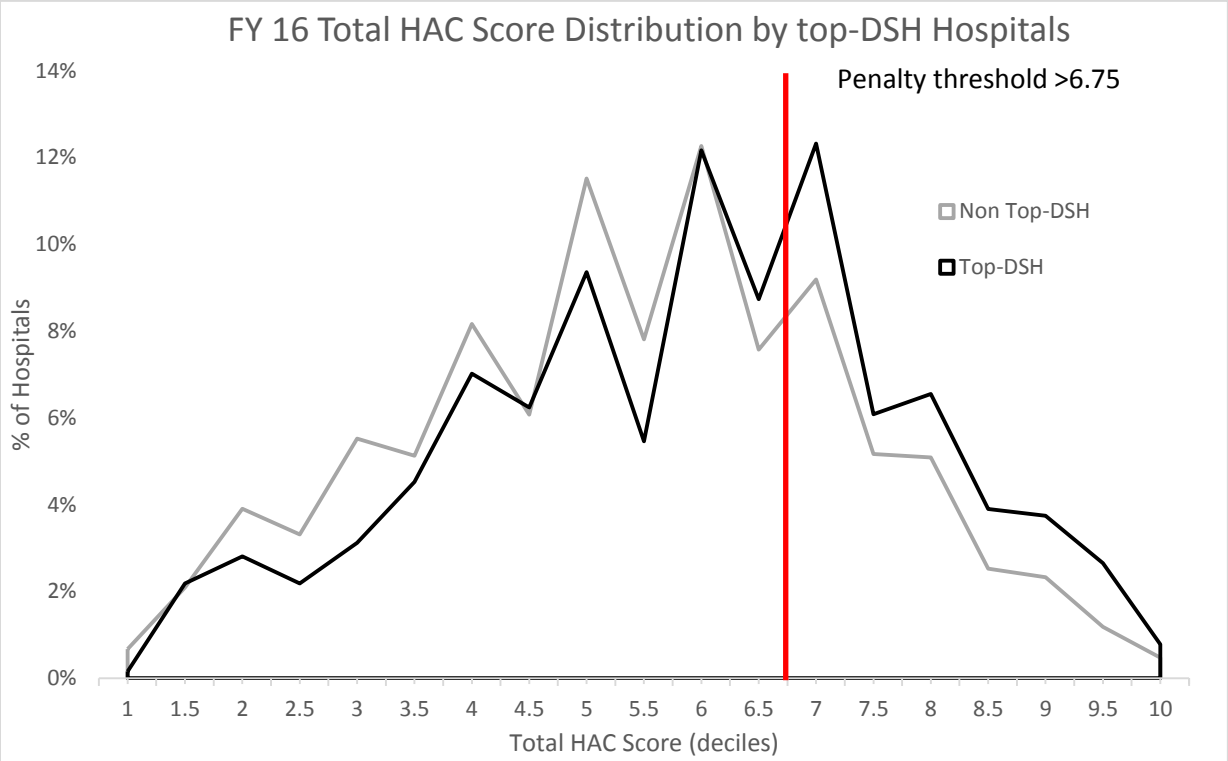


Table 6.9 compares each hospital type to all other hospitals – for example, safety-net hospitals as categorized by DSH Index versus non-safety-net hospitals. Overall, high-DSH hospitals were the worst performers on average, with an average Total HACRP Score of 5.8; this score was 0.4 points worse than non-high-DSH hospitals and was driven by poor performance in both Domain 1 and Domain 2. Rural hospitals were the best performers on average, with a Total HAC Score of 4.9.

Table 6.9: Domain and Total HAC Scores by Hospital Type, FY2016

Hospital Type	Domain 1: PSIs	Domain 2: CDC	Total HAC Score	Difference in Total Score, vs Other Hospitals*
SNH (high DSH)	5.9	5.7	5.8	**0.4**
High-Dual	5.5	5.3	5.4	0.0
Low-income ZCTA	5.5	5.1	5.3	-0.1
High-Black	5.8	5.7	5.8	**0.4**
High-Hispanic	5.6	5.6	5.6	**0.3**
High-Disabled	5.6	5.0	5.3	-0.2
Rural (non-MSA)	5.3	4.6	5.0	**-0.6**

Higher domain and total scores represent worse performance. MSA=metropolitan statistical area; SNH=safety-net hospital. Bolded differences are statistically significant at p<0.01. *Comparisons are for the group of interest versus all hospitals not in that group; for example, safety-net versus non-safety-net, or rural versus non-rural.

The differences in average scores translated to very different likelihoods of being penalized. Recall that in the HACRP the worst 25% of hospitals are assessed a penalty equal to 1% of total Medicare IPPS payments. In reality, because of ties in decile scores and other program exclusions, only 22% of hospitals ended up penalized in FY 2015. Table 6.10 shows the likelihood of being penalized and average penalties, and shows that safety-net (high-DSH) hospitals had 70% higher odds of being penalized than non-safety-net hospitals. Rural hospitals were half as likely to be penalized as their urban counterparts. High-DSH hospitals also had high penalties in dollar value (rightmost column) because they tend to be larger hospitals with higher annual revenues; their base Medicare payments are also higher due to add-on DSH and Indirect Medical Education (IME) payments. In multivariate analyses including all of the above factors plus teaching status, hospital size, location, and ownership, safety-net status remained associated with 30% higher odds of being penalized.

Table 6.10: Likelihood of Penalty and Average Penalty, by Hospital Type, FY2016

Hospital Type	Proportion of Hospitals Penalized	Odds of Penalty (compared to hospitals not in the group of interest)	Average Penalty in Thousands of Dollars (among penalized hospitals)*
Overall Program	25%	n/a	$435.0
SNH (high DSH)	31%	**1.5**	$513.9
High-Dual	25%	1.1	$315.6
Low-income ZCTA	23%	0.9	$326.2
High-Black	30%	**1.4**	$551.9
High-Hispanic	28%	1.3	$458.2
High-Disabled	24%	1.0	$319.4
Rural (non-MSA)	19%	**0.7**	$130.2
All bolded comparisons are significant at p<0.001. *Penalty is 1% of total Medicare hospital payments.			

VI. Policy Options

A. Introduction

Policy options are simulated, and weighed against the policy criteria outlined in Chapter 1 to ultimately inform strategies and considerations for accounting for social risk. Those policy criteria are reiterated in Table 6.11:

Table 6.11. Policy Criteria

Policy Criteria
1. Encourages reduction in disparities in quality and outcomes
2. Protects beneficiaries' access to care by reducing disincentives to caring for high-risk populations
3. Protects providers from unfair financial stress
4. Adjusts only for the difference in performance related directly to the social risk factor, and only for what is beyond provider control
5. Promotes transparency to facilitate consumer choice
6. Supports delivery system reform and Alternative Payment Models

How policymakers weight these criteria could differ. For example, some may feel that protecting providers from unfair financial stress is the most important criterion, and may be willing to adjust for factors under providers' control or negatively impact transparency to achieve that goal. On the other hand, some may feel that transparency is the most important criterion, and argue that avoiding financial stress for providers or promoting delivery system reform are less important policy considerations.

In keeping with other analyses in this report, five main policy options are presented: (1) status quo, (2) risk-adjustment, (3) stratification, (4) rewarding improvement, and (5) providing a bonus for high performance for populations who are socially at-risk. In addition, analyses were performed to simulate two additional ways to level the playing field for the safety net by restructuring the current program, namely (1) changing payment calculations to base DRG payments instead of total IPPS payments and (2) restructuring the HACRP to a linear penalty scale that would spread penalties more broadly. Finally, CMS' changes to the HACRP for FY 2018 (incorporating harms-based weighting and moving to a z-score methodology) were modeled. For each option, after applying the policy strategy (adjustment, stratification, etc.) and re-calculating a program score, hospitals were re-ranked, and the worst 25% were considered to be in penalty status. Policy simulations were modeled based on FY2015 program data and measures, except for the improvement policy option which by necessity used data from both years, FY2015 and FY2016, to measure improvement. Table 6.12 provides an overview of the policy options, and the text that follows provides additional detail on each.

Table 6.12: Summary of Policy Options

Option	Description	Pros of Option	Cons of Option
1. Status Quo	Current Program	• Hospitals' performance on patient safety assessed in a clear way to determine penalties.	• Safety-net hospitals are more likely to be penalized in the current program, which may in part reflect differences in the complexity of the patients they serve.
2. Adjustment	Risk-adjust measures for social risk, disability, or medical complexity at patient-level for PSI-90 or hospital-level for HAI measures (see options 2a-2f)	• May protect providers from unfair financial stress • May protect beneficiaries' access to care by reducing disincentives to caring for high-risk populations	• May reduce incentives to reduce disparities in quality and outcomes • May adjust for differences in performance unrelated to social risk, or under provider control. • May worsen transparency
3. Stratification	3a) Stratify hospitals into two strata by DSH Index (hospitals in top 20% DSH Index versus the rest) 3b) Stratify hospitals into five strata by DSH quintiles	• May protect providers from unfair financial stress • May protect beneficiaries' access to care by reducing disincentives to caring for high-risk populations.	• May reduce incentives to reduce disparities in quality and outcomes • May adjust for differences in performance unrelated to social risk, or under provider control. • May worsen transparency
4. Improvement credit	Allow hospitals to "buy down" penalty based on improvement.	• May protect providers from unfair financial stress • May protect beneficiaries' access to care by reducing disincentives to caring for high-risk populations.	• May reduce incentives to reduce disparities in quality and outcomes • May adjust for differences in performance unrelated to social risk, or under provider control • May worsen transparency • If improvement does not differ by safety-net status, this option does not address differences due to social risk.
5. Improvement credit, based on social risk	Extra credit for improvement buy-down by DSH. This option is another variation of the improvement option, but addresses differences in hospitals' patient populations based on social risk.	• To address the limitations of an improvement-only credit, this option gives extra credit for improvement for hospitals who serve beneficiaries with social risk factors, to recognize it may be harder to improve in that setting.	• May reduce incentives to reduce disparities in quality and outcomes • May adjust for differences in performance unrelated to social risk, or under provider control • May worsen transparency

6. **Program re-structuring**	6a) Penalties on base DRG payments instead of IPPS payments. 6b) Use a linear penalty scale to calculate penalties	• Penalties calculated on base DRG payments would align hospital programs. • Linear penalty scale would provide incentives for improvement across a broad range of performance, rather than just around the 25th percentile.	• Does not directly address social risk, except for in as much as it would reduce the penalty for safety-net hospitals and other hospitals with add-on payments above base DRG.
7. Effect of Changes to PSI-90 and scoring system (see FY2017 IPPS Final Rule)	7a) Move to harms-based weights for PSI-90 7b) Replace decile-based scores with winsorized z-scores 7c) Move to harms-based weights for PSI-90 and replace decile-based scores with winsorized z-scores	• Modified PSI-90 and continuous scoring better reflect differences in hospital performance and harms to patients	• Safety-net hospitals may perform worse on the modified PSI-90 measure.
8. Effect of Changes to PSI-90 and scoring system (see FY2017 IPPS Final Rule) Plus Adjustment or Stratification options	8a) CMS-planned changes above plus adjustment - adjust PSI-90 for dually enrolled beneficiaries; adjust CDC measures by DSH, HCC, or both 8b) CMS proposed changes plus and stratification	• As above for adjustment and stratification options	• As above for adjustment and stratification options

B. Policy Options Simulation Results

1. Status Quo

The first option was to keep the status quo, making no changes to the program. However, it is the Department's position that the HACRP may warrant changes, to improve its ability to fairly and accurately incent and reward quality. Thus, options for change were considered, as presented below.

2. Adjustment

a. Regression-Based Risk-Adjustment for Social Risk Factors

The first option modeled was to add beneficiary social risk factors to the risk-adjustment models. Doing so would potentially meet the policy criteria of reducing disincentives to caring for high-risk populations, or protecting providers from unfair financial stress. However, the drawback of this option is that it risks masking true disparities in care, by adjusting for differences in performance related to factors beyond the social risk factor itself and/or under providers' control, such as bias or discrimination. It could also reduce incentives to address disparities in quality and outcomes, and negatively impact transparency to facilitate consumer choice.

Adjustment of measures for social risk would be a budget-neutral policy option but might require re-specification and testing of the measure by the measure developer and re-endorsement of the measure by NQF, if changes are significant.

To test this adjustment, dual enrollment status and census-based social risk factors were added to the risk models for each PSI-90 component, which were then compared to the current FY 2015 HACRP measures and domain weights. Table 6.13 shows the results of these adjustments. Adding beneficiary social risk to each of the PSI-90 component measures increased penalties in both groups but did not change the difference between safety-net and non-safety-net hospitals. The reason that adjusting for social risk led to worse scores, which may be counterintuitive, is that the two PSIs accounting for the majority (roughly 75%) of the current PSI-90 composite, blood clot and accidental puncture/laceration, were less likely to affect patients who are socially at-risk. Therefore, adjusting for social risk led to a worsening in these two measure scores, which in turn led to an overall worse performance score for safety-net hospitals. These findings suggest that adjusting for social risk at the individual level does not reduce the gap for safety-net hospitals, at least as the PSI-90 composite measure is currently constructed and weighted; this should be re-examined when the modified PSI-90 measure is finalized and available for analysis.

Table 6.13: Percent Penalized After Adjusting PSI-90 for Social Risk Factors

Hospital Type	% Penalized Under Current Policy	Add Dual Enrollment Status to PSI-90 Risk Adjustment	Add Dual Enrollment, Entitlement for Medicare based on Disability, Race, Ethnicity, and Census-based Risk Factors to PSI-90 Risk Adjustment
Safety-Net (top 20% DSH)	29.8%	32.6%	31.8%
Non-Safety-Net (all other)	20.1%	22.5%	22.7%
Difference	**9.7%**	**10.1%**	**9.1%**

Performance data for FY 2015 HACRP program year were used to calculate the PSI-90 measures and incorporate social risk factors. Revised Domain 1 scores were calculated after adjusting the PSI-90 measure and combined with current (FY 2015) CDC measure scores to determine revised Total HAC Scores and revised penalty status of hospitals. Bolded comparisons are significant at $p<0.05$.

It would also be feasible to adjust the PSIs for social risk factors at the individual level using beneficiary characteristics (dual enrollment, entitlement based on disability, census neighborhood characteristics, etc.) and also adjust the CDC HAI measures at the hospital level using the DSH Index or another measure of hospital social risk. Such an approach would reduce disincentives to caring for high-risk populations. However, hospital-level adjustment option for the HAI measures is even less appealing than adjusting purely at the individual level (e.g., dual status for PSI component measures) because it would effectively adjust for both within-hospital (i.e., due to patient factors) and between-hospital differences, and thus risk masking important differences between these groups of hospitals in the quality of care delivered. This option would be budget-neutral, and would require measure re-specification and rulemaking for implementation.

Simulating this approach led to a smaller difference between safety-net and other hospitals penalized, dropping it by more than half from nearly 10% to less than 4% (Table 6.14). Adjusting the HAI measures (i.e., CLABSI and CAUTI) measures at the patient level for either medical or social risk would be preferable but is not currently feasible, as data for these HAI measures are submitted by hospitals at the hospital level and only risk-adjusted for facility characteristics at this time.

Table 6.14: Percent Penalized After Adjusting PSIs for Social Risk and CDC measures for DSH Index

Hospital Type	% Penalized Under Current Policy	Adjust PSIs for Social Risk Factors and CDC Measures for DSH index
Safety-Net (top 20% DSH)	29.8%	27.8%
Non-Safety-Net (all other)	20.1%	24.1%
Difference	**9.7%**	**3.7%**

Note: PSI-90 is adjusted for dual, disability, race and ethnicity, and ZCTA-level Census measures of social risk. CDC measures are adjusted for hospital DSH index. Bolded comparisons are significant at $p<0.05$.

b. Regression-based Risk-Adjustment for Additional Medical Complexity

One other important issue is whether unmeasured medical complexity may partly explain the observed relationship between patients' social risk and PSI-90 measure performance. If the observed effect of social risk is due to unmeasured medical complexity or multi-morbidity, it may be important to incorporate this missing clinical information. This policy option would reduce disincentives to caring for high-risk populations and protect providers from unfair financial stress. It would be budget-neutral, and would require measure re-specification and rulemaking.

Medical complexity was evaluated in two ways: first, by adding disability status to the model, and second, by adding a marker for medical complexity. To define medical complexity, Medicare's Hierarchical Condition Category (HCC) medical risk scores were calculated using a one-year look-back window in Medicare claims. These scores were divided them into risk quintiles, with the highest risk quintile defined as medically complex. The HCCs will capture comorbidities that have been diagnosed and documented in Medicare claims, and may augment comorbidities included in a measure's clinical risk-adjustment. However, HCCs may not capture other comorbidities such as limitations in functioning or undiagnosed conditions.

Adding medical complexity to the model increased penalties in both groups because it broke a number of ties in scores at the 75th percentile, leading to a final proportion of hospitals penalized much closer to 25% than the initial program; the gap between safety-net and non-safety-net hospitals remained (Table 6.15). These findings suggest that adjusting for medical complexity using disability or risk quintiles does not reduce the differential penalty for safety-net hospitals, at least when only applied to the PSI measures (which comprise a minority of the total score). Other ways to identify medical complexity may yield different results.

Table 6.15: Percent Penalized After Adjusting PSI-90 for Disability or Medical Complexity

Hospital Type	% Penalized Under Current Policy	Add Disability to PSI-90 Risk Adjustment	Add Medical Complexity (top Quintile of HCC scores) to PSI-90 Risk Adjustment
Safety-Net (top 20% DSH)	29.8%	34.0%	33.8%
Non-Safety-Net (all other)	20.1%	22.7%	22.6%
Difference	**9.7%**	**11.3%**	**11.2%**

*Disability flag and medical complexity (top 20% of HCC scores) were added separately to the PSI-90 risk-adjustment. Bolded comparisons are significant at $p<0.05$.

It would also be feasible to adjust the PSIs for medical complexity at the individual level using HCC medical risk scores and also adjust the CDC measures at the hospital level using the hospital's Patient Case Mix Index (CMI) as a measure of overall medical complexity at a hospital. As noted above, this is a less attractive option because it lacks the precision of patient-based risk adjustment. Under this approach, again more hospitals were penalized due to fewer ties, and the gap between safety-net and non-safety-net hospitals was unchanged (Table 6.16).

Table 6.16: Percent Penalized After Adjusting PSIs for Medical Complexity and CDC measures for Case Mix Index

Hospital Type	% Penalized Under Current Policy	Adjust PSIs for Medical Complexity and CDC Measures for Case Mix Index*
Safety-Net (top 20% DSH)	29.8%	33.5%
Non-Safety-Net (all other)	20.1%	22.8%
Difference	**9.7%**	**10.7%**

*Medical complexity flag (top 20% of HCC scores) was added to the PSI-90 risk-adjustment. CDC measures were adjusted based on each hospital's patient case-mix index (*CMI*, version 32) reported in the 2012 Medicare Cost Reports. Bolded comparisons are significant at p<0.05.

3. Stratification

Stratification refers to breaking hospitals into groups and then judging their performance, in essence attempting to create groups to allow the comparison of "like with like." This policy option would reduce disincentives to caring for high-risk populations and protect providers from unfair financial stress. However, it would not encourage reduction in disparities, and could negatively impact transparency, depending on how it was applied. It would also set different standards for different hospitals, effectively adjust for both within-hospital (i.e., due to patient factors) and between-hospital differences, and thus risk masking important differences between these groups of hospitals in the quality of care delivered. Finally, depending how the groups were defined, it could create policy "cliffs" whereby two hospitals with relatively similar social risk profiles are in two different peer groups and therefore held to different standards.

Stratification would be a roughly budget-neutral policy option. To model a stratification option, hospitals were divided first into two peer groups (top quintile DSH and all others), and then into five groups based on quintiles of DSH index. The worst 25% of performers were then identified within each group and assigned the penalty status. Table 6.17 shows the impact on penalties under stratification by two or five groups; this option reduced the proportion of hospitals that were penalized significantly for the safety-net.

Table 6.17: Percent Penalized After Stratification into Two or Five Groups based on DSH Index

Hospital Type	% Penalized Under Current Policy	Stratify into Two Groups by DSH Index (top 20% vs other)	Stratify into Five Groups by DSH Index (quintiles)
Safety-Net (top 20% DSH)	29.8%	24.9%	24.9%
Non-Safety-Net (all other)	20.1%	24.6%	23.3%
Difference	**9.7%**	0.3%	1.6%

Bolded comparisons are significant at p<0.05. Note: Proportion penalized in each stratum is not exactly 25% due to ties in hospitals' decile scores.

4. Rewarding Improvement

Currently, the HACRP does not directly incorporate a hospital's improvement over time in its scoring. Since the program penalizes the top quartile of hospitals based on the total HACRP score, hospitals whose performance improves within the penalty zone do not get credit unless they move below the penalty threshold. Safety-net hospitals may be more likely to have worse scores based on achievement due to resource constraints but could be working hard to improve. Under a threshold-based penalty program, the poorest performers may find it difficult to move past the penalty threshold. One policy option to address this issue is to build an improvement measure into the program while maintaining the top 25% threshold-based penalty program design. This option does not explicitly address beneficiary social risk, but the option to reward improvement differentially based on social make-up could give extra credit to safety-net hospitals for their efforts to improve care for the beneficiaries with social risk factors they serve.

Changes to the program's payment determination would reduce the penalties received by CMS and therefore would not be budget neutral, although reductions in penalties would be fairly small.

A policy option was modeled in which hospitals that were in the penalty range could "buy down" their penalty based on the amount of improvement they made from the prior year. A continuous score instead of the stepped decile scores is needed to measure small improvements in patient safety rates; in this example winsorized z-scores were applied. The amount of the buy-down was the hospital's percentile improvement divided by 24% (the maximal percentile improvement in the penalty range; for details see the Appendix to this chapter.) For example, a hospital that improved from the 92nd to the 80th percentile would still be in the penalty range, but would see its penalty reduced by 12%/24%= 50%. Thus, the final penalty would be 0.5% rather than 1.0% of total Medicare payments. This approach would only reduce the penalty amount, and not the proportion of hospitals penalized.

Under this option, the proportion of hospitals penalized remained unchanged, but the average penalty per hospital was reduced by about $40-50,000 (Table 6.18). Improvement scores on average were slightly lower for safety-net status hospitals: about 0.20 for safety-net hospitals versus 0.26 for other hospitals, although slightly more safety-net hospitals showed improvement (25% vs. 19%). (See the Appendix to this chapter for details). Thus, allowing an improvement buy-down led to small changes in program impacts, with the difference in penalty amount between safety-net and other hospitals dropping slightly from $89,000 to $84,000 on average.

Table 6.18: Percent Penalized and Penalty Amount After Applying Improvement Buy-Down

Hospital Type	% Penalized Under Current Policy, FY 2016*	% Penalized Under Improvement Buy-Down	Average Penalty Under Current Policy, FY 2016, in Thousands of Dollars	Average Penalty Under Improvement Buy-Down in Thousands of Dollars
Safety-Net (top 20% DSH)	34.0%	34.0%	$525	$475
Non-Safety-Net (all other)	23.1%	23.1%	$436	$391
Difference	**10.9%**	**10.9%**	**$89**	**$84**

Bolded comparisons are significant at p<0.05.
*For the improvement policy options, which require multiple years of data to calculate, FY 2016 performance with and without the improvement buy-down are presented. These simulations only include hospitals with data in both FY 2015 and FY 2016. The average penalty amounts in FY 2016 for safety-net hospitals were lower than in FY 2015 due to fewer outlier safety-net hospitals with high penalty amounts. Therefore the difference in penalty amount is smaller in FY 2016 than FY 2015, but is not due to the policy option modeled.

5. Extra credit for Improvement for Hospitals Serving Socially at-risk Populations

The option to include a bonus for improvement in beneficiaries with social risk factors is an extension of the improvement buy-down option described above, except that the improvement buy-down amount is multiplied by the DSH index or the hospital's share of the social risk factor of interest. Starting from the example above, a hospital that improved from the 92nd to 80th percentile would have its penalty reduced by 12%/24%*DSH Index. Thus, a hospital with a DSH Index of 100 would receive the entire buy-down of 0.5%, while a hospital with a DSH Index of 50 would receive half the buy-down at 0.25% (see Appendix to this chapter for details). Under this option, hospitals with more beneficiaries with social risk factors would get greater credit for improvement, while hospitals with fewer would not be given as much credit for improvement. Like the general improvement option, this would likely not be budget neutral.

When this option was simulated, as shown in Table 6.19, safety-net hospitals received greater credit for improvement than other hospitals, as anticipated. Specifically, allowing a scaled improvement buy-down reduced the average penalty amount to only about 0.7% instead of the total 1% penalty.

Table 6.19: Percent Penalized and Penalty Amount After Applying Improvement Buy-Down Scaled by DSH

Hospital Type	% Penalized Under Current Policy, FY 2016*	% Penalized Under Improvement Buy-Down Scaled by DSH	Average Penalty Under Current Policy, FY 2016 in Thousands of Dollars	Average Penalty Under Improvement Buy-Down Scaled by DSH
Safety-Net (top 20% DSH)	34.0%	34.0%	$525	$497
Non-Safety-Net (all other)	23.1%	23.1%	$436	$424
Difference	**10.9%**	**10.9%**	**$89**	**$73**

Bolded comparisons are significant at p<0.05.
*For the improvement policy options, which require multiple years of data to calculate, FY 2016 performance with and without the improvement buy-down are presented. These simulations only include hospitals with data in both FY 2015 and FY 2016.

6. Program-specific Policy Option: Restructured HACRP

As currently defined, the HACRP is a penalty program with a single policy cliff to identify hospitals in the top quartile of performance on patient safety, with a flat 1% penalty applied to penalized hospitals. Restructuring the overall program parameters could affect who gets penalized, and by how much, and therefore could impact providers disproportionately serving beneficiaries with social risk factors. Several changes are proposed and simulated below, based on assumptions of budget neutrality.

a. Calculate Penalties Using Base DRG Payments

In contrast to the Hospital Readmissions Reduction Program (HRRP) and the Hospital Value-Based Purchasing Program (HVBP), the HACRP assesses penalties based on total Medicare IPPS payments rather than base DRG payments. As a result, the HACRP has disproportionately greater financial impacts on safety-net and teaching hospitals, since IPPS payments include add-on payments for disproportionate share hospital (DSH) and Indirect Medical Education (IME) that translate into larger calculated penalties. The rationale for moving to base DRG payments is to level the playing field across hospitals in terms of the dollar impacts on safety-net hospitals compared with other hospitals. Since DSH payments are intended to provide additional resources for safety-net hospitals that disproportionately serve the poor and uninsured, determining penalties based on these additional payments effectively reduces these resources to support care for beneficiaries with social risk factors. Therefore, while this policy option does not directly address social risk, it may have a disproportionate impact on safety-net providers.

To assess penalties based on DRG rather than IPPS payments but remain budget-neutral, the penalty amount would need to be increased from the current 1% to 1.3%. This policy option would not change the proportion of hospitals penalized, but would reduce the financial impact on safety-net hospitals, as shown in Table 6.20, reducing the disproportionate dollar impact on safety-net hospitals.

Table 6.20: Penalties Under Base DRG Instead of Total IPPS Payments

Hospital Type	% Penalized Under Current Policy	% Penalized Under Shift to Base DRG Payments	Average Penalty Under Current Policy in Thousands of Dollars	Average Penalty Under Shift to Base DRG Payments in Thousands of Dollars
Safety-Net (top 20% DSH)	29.8%	29.8%	$606	$482
Non-Safety-Net (all other)	20.1%	20.1%	$445	$456
Difference	**9.7%**	**9.7%**	**$161**	$26

b. Move to a Linear Penalty Scale

A second limitation of the current approach to determining penalty status based on a single threshold (top quartile) is that the program may not incentivize improvements by very low performers who are far from the 75th percentile cutoff threshold. It also does not differentiate between hospitals with very different performance (e.g., at the 75th versus 99th percentiles) and may seem to have an unduly large

impact on those just over the 75th percentile versus those just below that cutoff. One way to address this problem is to shift to a linear penalty performance scale, wherein the penalty amount is based on the hospital's performance along a broader distribution scale.

Two choices that would need to be made to implement this policy option are the proportion of hospitals to be penalized (i.e., increasing from 25% to 50% or 75%; see the Appendix to this chapter for 50% example) and the maximum penalty to be levied over the current 1%. Table 6.21 illustrates the change in penalties from moving to a linear penalty scale, penalizing 75% of all hospitals based on their relative performance, with a 1.25% penalty cap. The option shown also includes moving to the base DRG as the penalty target, and is budget-neutral (i.e. total penalty dollars are equivalent or higher than the current program). This policy option does not directly address social risk, but could have a disproportionate impact on safety-net providers depending on the performance distribution of these hospitals.

These results show that moving to this version of the linear scale would reduce the disproportionate dollar impact on safety-net hospitals significantly, but that safety-net hospitals would still be much more likely to be penalized than other hospitals. It would also broaden penalties significantly, which may not be in line with program goals. Additional versions of this approach are shown in the Appendix to this chapter.

Table 6.21: Penalties Under Linear Scale with 75% of Hospitals Penalized, Penalties Capped at 1.25% of Base DRG Payments

Hospital Type	% Penalized Under Current Policy	% Penalized Under Linear Scale, 75% of Hospitals, 1.25% Cap	Average Penalty Under Current Policy	Average Penalty Under Linear Scale, 75% of Hospitals, 1.25% Cap
Safety-Net (top 20% DSH)	29.8%	80.0%	$606	$234
Non Safety-Net (all other)	20.1%	73.6%	$445	$183
Difference	**9.7%**	**6.4%**	**$161**	**$51**
Bolded comparisons are significant at p<0.001				

7. CMS-planned changes to the HACRP on scoring system and PSI-90 (see FY2017 IPPS Final Rule)

a. Harms-based weighting

AHRQ has revised the PSI-90 measure to include three additional component measures (PSI-9, PSI-10, and PSI-11), to remove PSI-07, and to incorporate harm- and volume-based weights for PSI-90 version 6, which was recently endorsed by NQF, and which CMS will adopt. These changes, especially the harms-based weighting, could affect the observed impact of social risk on hospitals' performance on the PSI-90 measure, as the three components with a more than 10% increase in weight, PSI-9, PSI-11, and PSI-13, are all ones that dually enrolled beneficiaries have higher odds of experiencing (Table 6.22).

Table 6.22. PSI-90 version 6, Harms-based and volume-based weights

Number	Name	Odds of Event for Dual Enrollees*	Current Weights	New Weights†	Change
PSI-3	Pressure Ulcer	1.06	2.3%	3.6%	+1.3%
PSI-6	Iatrogenic Pneumothorax	**0.92**	7.1%	9.6%	+2.5%
PSI-7	Catheter-Related BSI‡	**1.36**	6.5%	1.6	-4.9%
PSI-8	Postop Hip Fracture	**1.33**	0.1%	0.9%	+0.8%
PSI-9	Periop hemorrhage/hematoma	**1.03**	NA	14.8%	+14.8%
PSI-10	Postop Phys/Metabolic Derangement	0.95	NA	4.8%	+4.8%
PSI-11	Postop Respiratory Failure	**1.14**	NA	21.2%	+21.2%
PSI-12	Periop PE/DVT	**0.91**	25.8%	18.1%	-7.7%
PSI-13	Postop Sepsis	**1.17**	7.4%	23.7%	+16.3%
PSI-14	Postop Wound Dehiscence	**1.37**	1.7%	0.9%	-0.8%
PSI-15	Accidental Puncture/Laceration**	0.99	49.2%	0.8%	-48.4%

*Risk-adjusted, within-hospital odds. Odds ratios greater than 1 indicate increased risk of event; odds ratios less than 1 indicate reduced risk. Bolded comparisons are significant at p<0.05.
†The new weights above are proxies, pending release of the final specifications by AHRQ.
‡ PSI-7 will be removed from the final modified PSI-90 composite measure as it duplicates the CDC's CLABSI measure.
**Definition of event changed to only include events of high severity in version 6.

When these changes were simulated, under the revised PSI-90 measure, the gap between safety-net and non-safety-net hospitals widened significantly, from 9.8% to 13.7% (Table 6.23). This finding suggests that the new weighting scheme would likely be associated with a more negative impact for the safety-net.

Table 6.23: Percent Penalized Under New PSI-90 Weighting Scheme and 3 Additional Components

Hospital Type	% Penalized Under Current Policy	% Penalized Under New PSI-90 Weights/Components
Safety-Net (top 20% DSH)	29.8%	32.5%
Non-Safety-Net (all other)	20.1%	18.8%
Difference	**9.7%**	**13.7%**

Bolded comparisons are significant at p<0.05.

b. Winsorized Z-Scores and Harms-Based Weights for PSI-90

CMS has revised the HACRP scoring methodology to use winsorized z-scores instead of decile-based scores to improve the precision of the program and reduce ties, which led to unusual performance patterns (see 81 Fed. Reg. 56761). Z-scores standardize hospitals' performance based on the number of standard deviations from the average (positive or negative) and allow greater comparability between measures with different distributions and units of measurement. Winsorizing trims outlier hospitals to the 5th and 95th percentile scores.

Table 6.24 shows that the proportion of safety-net hospitals penalized under this revised scoring scheme would increase. Combining the two proposed changes (z-scoring and harms-based weights) would increase the difference in proportion penalized even further for safety-net hospitals compared to non-safety-net hospitals, from 10% to 14%. Therefore, the changes planned for future years of the HACRP may be associated with a higher penalty burden for the safety net, even though these changes may better reflect hospitals' performance.

Table 6.24: Percent Penalized under Winsorized Z-scores and Harms-Based Weights

Hospital Type	% Penalized Under Current Policy	% Penalized Under Winsorized Z-scores	% Penalized Under Winsorized Z-scores and Harms-Based Weights
Safety-Net (top 20% DSH)	29.8%	34.3%	36.3%
Non-Safety-Net (all other)	20.1%	22.6%	22.1%
Difference	**9.7%**	**11.7%**	**14.2%**
Bolded comparisons are significant at p<0.05.			

8. Changes to the HACRP on scoring system and PSI-90 (see FY2017 IPPS Final Rule) Plus Adjustment or Stratification

To address the higher penalty burden for the safety net under CMS' planned changes to the program scoring methodology and updates to the PSI-90 measure, policy options likely to change the proportion of safety-net hospitals penalized or the penalty amount — namely adjustment for social risk and stratification – were modeled. As indicated earlier, these options have drawbacks, most significantly in terms of potentially masking disparities or excusing bias, discrimination, or poor quality. They would be budget neutral. Table 6.25 shows the proportion penalized under the proposed CMS changes under each of these three policy options.

Similarly to the findings in the adjustment simulation above, adjusting for dual enrollment status and DSH index reduced disproportionate penalties for the safety net significantly. Stratification equalized the proportion of hospitals penalized across groups.

Table 6.25: Percent Penalized under Winsorized Z-scores and Harms-Based Weights plus Adjustment or Stratification

		% Penalized Under Z-scores & New PSI-90 Weights, Plus:		
Hospital Type	**% Penalized under Z-scores & new PSI-90 Weights**	**Plus Adjustment for Social Risk (CDC for HCC and DSH Index)**	**Plus Adjustment for Social Risk (PSI-90 dual, CDC for DSH)**	**Plus Stratification (2 strata)**
Safety-Net (top 20% DSH)	36.3%	31.5%	30.5%	24.9%
Non-Safety-Net (all other)	22.1%	23.3%	23.6%	25.0%
Difference	**14.2%**	**8.2%**	**6.9%**	-0.1%
Bolded differences are significant at p<0.001.				

C. Summary of Policy Options

Tables 6.26 a-c present the proportions of hospitals penalized, and summarize the amount of the penalty under each option. Of the tested options, only those that included stratification of program scores had a major impact on penalties. Individual-level adjustment for social risk had very little impact; hospital-level adjustment had a larger impact. Allowing improvement buy-downs of the penalties and moving to a base DRG-based penalty reduced the penalty amount for safety-net hospitals. Additional options are shown in the Appendix to this chapter.

Table 6.26a Policy options (adjustment, stratification, program restructuring, CMS proposed changes) – Safety-Net Versus Other Hospitals

Option	Description	Percent Hospitals Penalized			Average Penalty ($ thousands)		
		Safety Net	Rest	Difference	Safety Net	Rest	Difference
1	Current HACR program (FY 2015)	29.8%	20.1%	**9.7%**	$606	$446	**$161**
2	**Adjustment for social and/or medical risk options**						
2a	Adjust PSI-90 for dual	32.6%	22.5%	**10.1%**	$645	$461	**$184**
2b	Adjust PSI-90 for disabled	34.0%	22.7%	**11.3%**	$631	$469	**$162**
2c	Adjust PSI-90 for dual, disabled, r/e, census-SES	31.8%	22.7%	**9.1%**	$643	$460	**$183**
2d	2c, plus adjust CDC for DSH Index	27.8%	24.1%	**3.7%**	$665	$451	**$214**
2e	Adjust PSI-90 for medical complexity	33.8%	22.6%	**11.2%**	$627	$463	**$165**
2f	2e, plus adjust CDC for Case Mix Index	33.5%	22.8%	**10.7%**	$575	$399	**$176**
3	**Stratification options**						
3a	Stratify into 2 groups (top 20% DSH vs. other)	24.9%	24.6%	0.3%	$641	$386	**$255**
3b	Stratify into 5 groups (DSH quintiles)	24.9%	23.3%	1.6%	$641	$418	**$223**
6	**Program restructuring options**						
6a	Levy penalty on base DRG rather than IPPS payment	29.8%	20.1%	**9.7%**	$482	$456	$26
6b (ii)	Linear penalty scale: 75% of hospitals, 1.25% maximum	80.0%	73.6%	**6.4%**	$234	$183	**$51**
7	**CMS-Planned Changes**						
7a	Modified PSI-90	32.5%	18.7%	**13.7%**	$636	$500	**$136**
7b	Winsorized z-score	34.3%	22.6%	**11.7%**	$606	$439	**$167**
7c	Winsorized z-score and Modified PSI-90	36.3%	22.1%	**14.2%**	$652	$482	**$170**

Bolded comparisons are significant at p<0.001.

Table 6.26b Improvement Policy Options – Safety-Net Versus Other Hospitals

Option	Description	Percent Hospitals Penalized			Average Penalty ($ thousands)		
		Safety Net	Rest	Difference	Safety Net	Rest	Difference
1	Current HACR program (FY 2016) with winsorized z-scores (to calculate improvement)	34.0%	23.1%	**10.9%**	$525	$436	**$89**
4	Allow improvement buy-down of penalty	34.0%	23.1%	**10.9%**	$475	$391	**$84**
5a	Allow improvement buy-down, multiplied by DSH Index	34.0%	23.1%	**10.9%**	$497	$424	**$73**
5b	Allow improvement buy-down, multiplied by DSH +1	34.0%	23.1%	**10.9%**	$449	$380	**$70**

Bolded comparisons are significant at p<0.001.
Notes: FY 2016 program measures and weights used to determine baseline performance to compare improvement with or without DSH bonus options. This analysis only included hospitals with FY 2015 and FY 2016 performance data to calculate improvement scores.

Table 6.26c Program Changes, Plus Policy Options (adjustment, stratification) – Safety-Net Versus Other Hospitals

Option	Description	Percent Hospital Penalized			Average Penalty ($ thousands)		
		Safety Net	Rest	Difference	Safety Net	Rest	Difference
	Program Changes: Winsorized z-score and Modified PSI-90	36.3%	22.1%	**14.2%**	$652	$482	**$170**
8a	**Adjustment options**						
(i)	Adjust PSI-90 for dual	35.5%	22.3%	**13.2%**	$546	$386	**$160**
(ii)	Adjust PSI-90 for dual; adjust CDC for DSH Index	30.5%	23.6%	**6.9%**	$550	$388	**$162**
(iii)	Adjust PSI-90 for dual; adjust CDC for mean HCC score	33.8%	22.7%	**11.1%**	$544	$384	**$161**
(iv)	Adjust PSI-90 for dual; adjust CDC for DSH and HCC	30.6%	23.6%	**7.1%**	$552	$386	**$166**
(v)	Adjust CDC measures for DSH and HCC	31.5%	23.3%	**8.2%**	$659	$470	**$189**
8b	**Stratification options**						
(i)	Stratify into 2 groups (safety-net and non-safety-net)	24.9%	25.0%	-0.1%	$659	$475	**$183**
(ii)	Stratify into 5 groups (DSH quintiles)	24.9%	25.0%	0.0%	$659	$465	**$194**

Bolded comparisons are significant at p<0.001
Notes: FY2015 performance data with harms-weights applied to current PSI-90 measure, and winsorized z-scores to determine hospitals' scores to represent a revised baseline performance.

VII. Key Findings, Strategies, and Considerations

A. Key Findings

Underlying Relationships

- Both beneficiary social risk (dual enrollment status, disability as the original reason for Medicare entitlement, and Black race) and hospital makeup (highest quintile in terms of disproportionate share hospital (DSH) payments, beneficiaries with disabilities, or beneficiaries identified as Black) were independently and significantly associated with higher rates of patient safety events in the PSI-90 measure, suggesting both beneficiary factors and hospital factors contribute to patient safety events.

Program Impacts

- Safety-net hospitals (defined as those in the top quintile of DSH Index) and hospitals with a higher proportion of Black beneficiaries were more likely to be penalized under the HACRP.

Policy Simulations

- In policy simulations based on the current program and CMS-planned program changes, risk-adjusting the PSI-90 measure for beneficiary social risk and/or unmeasured medical complexity had minimal impact on penalties, as the PSI-90 makes up only a small portion of hospitals' total score under the HACRP.
- Adjusting CDC's Hospital-Acquired Infection measures at the hospital level for DSH Index as a proxy for beneficiary social risk, and average HCC scores as a proxy for unmeasured medical complexity, reduced the differences in penalty status between safety-net and non-safety-net hospitals.
- Stratifying hospitals into two groups (safety-net and non-safety-net) to determine penalties equalized the proportion of hospitals penalized by safety-net status.
- Restructuring the program to a linear penalty performance and basing penalty calculations on base DRG payments instead of total IPPS payments reduced the likelihood of penalties for the safety-net and reduced their average penalty dollars.
- Rewarding improvement had a limited impact on penalties.
- Future changes to the program (harms-based weighting in the modified PSI-90 and winsorized z-scores) are expected to lead to higher penalty rates for safety-net hospitals, but may better reflect performance differences and the severity of harms from safety events.

B. Strategies and Considerations

Strategies and considerations are outlined below. They are, as in all program chapters in this report, organized into three broad strategies that best meet the policy criteria outlined in Chapter 1. 1) Measure and report quality for beneficiaries with social risk factors; 2) Set high, fair standards for all beneficiaries; and 3) reward and support better outcomes for beneficiaries with social risk factors.

STRATEGY 1: Measure and Report Quality for Beneficiaries with Social Risk Factors

Measurement and reporting are foundational for quality improvement in health care.

CONSIDERATION 1: Consider enhancing data collection and developing statistical techniques to allow measurement and reporting of performance for beneficiaries with social risk factors on key patient safety and infection measures.

The ability to measure and track patient safety events and infection rates for beneficiaries with social risk factors over time is crucial as providers seek to reduce disparities and improve care for these groups to the greatest degree possible.

However, since CDC data are currently only collected by hospital ward, disparities at the patient level cannot be tracked. Therefore, a strategy should be developed to capture data that would allow calculation and reporting of performance by important subgroups. This strategy would allow the Department and hospitals, as well as consumers, to better-understand who performs well for dually-enrolled beneficiaries and where there are particular areas for targeted improvement. This is consistent with the policy goal of encouraging reductions in disparities in quality and outcomes, and also promotes transparency to facilitate consumer choice.

When adequate data are available, key patient safety and infection measures stratified by social risk should be developed and considered for hospital preview reports and/or public reporting in places such as Hospital Compare, so that hospitals, health systems, policymakers, and consumers can see and address important disparities in care. CMS' Office of Minority Health has started to develop and pilot approaches to reporting health plan quality data by race and ethnicity and other patient subgroups through its website (see https://www.cms.gov/About-CMS/Agency-Information/OMH/OMH-DPAG-StatisticsAndData.html). While not all measures may lend themselves to reporting by patient social risk subgroups, a key subset of measures should be pursued for subgroup reporting at the hospital level.

CONSIDERATION 2: Consider prospectively monitoring for potential unintended consequences of the HACRP; the cumulative penalties across the three hospital value-based purchasing programs should be tracked for hospitals that disproportionately serve beneficiaries with social risk factors.

Prospectively monitoring the financial impact of Medicare payment programs on providers disproportionately serving beneficiaries with social risk factors is critical as the programs continue to change. The HACR program is a relatively new program with new measures introduced each year. Prospectively monitoring the financial impact of this Medicare payment programs on providers disproportionately serving beneficiaries with social risk factors is critical as the program continues to change, such as changes to the scoring, measures and weighting.

For hospitals in particular, although penalties from a single program may be small, the additive penalties across all three programs (HRRP, HVBP and HACRP) may be significantly larger. Safety-net hospitals and other hospitals who disproportionately serve beneficiaries with social risk factors may be more likely to

be negatively impacted across the three hospital programs. Thus, monitoring should include both unintended consequences of the HACRP as well as cumulative performance across the hospital programs, with a focus on hospitals who disproportionately serve beneficiaries with social risk factors.

STRATEGY 2: Set High, Fair Standards for All Beneficiaries

Given the overarching goal of improving care for all beneficiaries, providers should be held to high, fair standards regardless of the beneficiaries they serve.

CONSIDERATION 1: Patient safety measures used in the current HACRP should continue to be examined to determine if adjustment for social risk factors is appropriate.

Directly adjusting the PSI-90 measures for dual enrollment or other social risk factors, while a relatively precise approach to adjustment compared to broader ward-based or hospital-based adjustment, risks masking modifiable disparities in care, and limiting future opportunities to analyze and highlight disparities. Further, depending on how such an adjustment was implemented, this strategy may risk excusing providers delivering low-quality care to at-risk populations. Additionally, because the PSI-90 comprises a relatively small portion of the total score, adjusting this measure for dual enrollment or other social risk factors would not make a significant difference in performance assessment or financial impacts in this program.

Adjusting the CDC measures for hospital-level measures of medical or social risk would be a crude approach that adjusts for both patient and hospital factors contributing to higher risk of events. Given the findings in this chapter demonstrating that both beneficiary and hospital factors contribute to outcomes, this could inappropriately reward hospitals that provide low-quality care to an even greater degree than the patient-level risk adjustment considered for the PSI-90 measure.

CONSIDERATION 2: The HACRP should be updated with AHRQ's revised PSI-90 measure, as CMS plans to do in FY2018.

The modified PSI-90 composite measure now reflects the degree of harms associated with the patient safety events. The move to harms-based weighting and incorporation of additional measures into the new version of the PSI-90 measure is a positive change for the measure because it better reflects the range and severity of harms from patient safety events. This is also a positive change for the program, because it will identify hospitals with the highest rates of severe harms. Adopting the modified PSI-90 measure in the program starting in FY2018 is therefore consistent with the policy goal of fair and accurate measurement.

The drawback is the negative impact on the safety net, but a superior measure should not be delayed because of this impact. Instead, additional effort should be devoted to addressing this in other ways, as outlined in the considerations that follow.

CONSIDERATION 3: Restructure the program to minimize differential impacts on hospitals disproportionately serving beneficiaries with social risk factors and incent improvement along the continuum of performance by determining penalties using base DRG payments and using a linear penalty scale rather than a binary penalty, with a continuous scoring approach, as included in the President's FY2016 budget.

There are additional program changes that warrant consideration based on the analyses in this Chapter that have relevance to safety-net hospitals. Based on the available evidence, in the long-term the HACRP should be considered for restructuring as proposed in the FY 2016 legislative proposal to Congress and included in the President's Budget. Program restructuring seems to provide the most significant overall benefits to the HACRP; moving to a linear penalty scale and calculating penalties on base DRG rather than total IPPS payments both reduce the disproportionate impact on the safety net, teaching hospitals, and other facilities that receive additional non-DRG compensation, and improves the program's incentive structure to reward improvement across a wider range of hospitals. These potential program changes are consistent with policy goals to improve quality and outcomes to promote delivery system reform and achieve value-driven care.

Moving to the winzorized z-score methodology instead of the decile-based scoring, as CMS plans starting in FY2018, is also supported and could provide a foundation for moving in the future to a linear penalty scale. Hospitals' performance on patient safety and healthcare associated infections are better reflected using a continuous scoring methodology, and this method also reduces ties and allows more precise assessment of improvement over time.

In addition, based on the net financial impact of the three hospital programs on safety-net hospitals, in the long term CMS should consider coordinating programmatic focus across the three hospital payment programs and aligning measures to avoid duplication of measures that may result in disproportionate payment impacts on safety-net hospitals who serve beneficiaries with social risk factors.

CONSIDERATION 4: Program measures should be studied to determine whether differences in health status might underlie the observed relationships between social risk and performance, and whether better adjustment for health status might improve the ability to differentiate true differences in performance between providers.

In particular, patient-level clinical data from the CDC healthcare associated infection measures should be examined and considered for risk adjustment. A long-term alternative would be to develop alternate safety measures such as all-harms measures using EHR data.

The clinical risk-adjustment of the patient safety and hospital-acquired infection measures should be improved to ensure the measures adequately adjust for differences in patients' clinical risk, so that fair comparisons for hospital accountability and performance assessment can be made to hold providers to

the same fair standard. To that end, additional analyses are recommended for measure developers such as AHRQ and CDC to determine whether adjusting key components of the patient safety or healthcare associated infection measures for frailty, functional limitations, prior hospitalizations or nursing home residence, or other markers of immune system deficiencies or unmeasured medical complexity may better account for susceptibility to infection and patient safety events. Such adjustments may not be appropriate for all patient safety measures – some are surely never-events regardless of clinical risk – but the evidence suggesting differential susceptibility to infection based on underlying medical risk is strong and should be considered.

For example, preliminary exploratory analyses of frailty-related diagnoses using claims data suggest these types of markers may be useful in improving clinical risk-adjustment models and could partially explain the observed relationship between dual enrollment and infection measures (See the Appendix on MSPB measure in HVBP chapter). Additional work in Study B may investigate some of these potential risk factors not currently available in Medicare claims or administrative data, such as measures of functional status from patient surveys or patient assessments.

A critical component of the HACRP that could not be fully evaluated for the current report due to limited data is the issue of the CDC measures. These measures are not reported at the patient level, are not risk-adjusted at the patient-level, and are collected on only a subset of hospitalized patients. As discussed earlier, without the ability to clinically risk-adjust these measures using patient-level clinical information, the higher infection rates observed in hospitals that disproportionately serve socially at-risk patients may be partly due to the lack of clinical risk-adjustment. This is particularly problematic given that the CDC measures make up the majority of the HACRP performance. Hospitals' average medical risk scores using HCCs and share of patient social risk using the DSH Index were also positively correlated, supporting the notion that the lack of clinical risk-adjustment in the CDC measures may contribute to the poorer observed performance in safety-net hospitals who disproportionately serve socially at-risk patients. However, until patient-level data are available for these measures, such suppositions are unproven. This is a critical area for future research.

Currently CDC relies on a manual data entry system to collect information from healthcare facilities on infections, which limits the amount of clinical or demographic information that can be feasibly collected. However, it is working towards an electronic data entry process through EHRs and surveillance software vendors (for more information on a broader plan, see https://health.gov/hcq/prevent-hai-action-plan.asp). This would allow capture of more clinical and laboratory data to support better risk-adjustment approaches. This report supports acceleration of CDC's efforts towards an electronic data capture system to facilitate and enhance patient-level risk-adjustment, as well as to support research to better understand the role of beneficiary social risk and underlying clinical risk on the risk of healthcare associated infections.

If patient-level data cannot be collected, alternative sources of infection data should be considered, including electronic health record data, clinical data registries and other emerging sources. Developing

the next generation of patient safety measures such as an all-harms measure that makes use of rich electronic clinical information on individual patients could improve the validity and usefulness of patient safety measures to improve inpatient care. In addition, better measures would improve transparency to consumers of the risks to their own safety, and facilitate their choice of hospital. CMS is actively pursuing many of these options, and this Report supports CMS efforts to continually improve the data and measures used to assess patient safety.

STRATEGY 3: Reward and Support Better Outcomes for Beneficiaries with Social Risk Factors

One of the important findings in this chapter was the wide distribution of performance among providers disproportionately serving beneficiaries with social risk factors. This suggests that achieving better outcomes for these groups is feasible. However, in many cases it may require more effort on the part of providers, or more resources and more support, than achieving the same outcomes in a lower-risk population.

CONSIDERATION 1: Consider creating financial incentives for achievement of low patient safety event rates and/or infection rates, or improvement in these measures, among socially at-risk beneficiaries.

Achievement and/or improvement in high-risk populations should be rewarded, and this could be done by adding targeted payment adjustments to existing value-based purchasing programs such as HACRP. Such opportunities would help counteract any disincentives under this program to caring for high-risk populations.

The program could reward hospitals for achieving low or improved rates in socially at-risk beneficiaries with payment adjustments funded in part from the HACRP penalties, essentially re-investing those penalties into improving patient safety in a budget-neutral way. Incentives funded by HACRP penalty revenues could be used to reward hospitals that demonstrate reduction of disparities in patient safety or demonstrate achievement of low safety events or infections in socially at-risk beneficiaries; this would meet the policy criterion of encouraging reductions in disparities. It may also be reasonable to ask these hospitals to re-invest the financial incentives into infrastructure and patient safety quality improvement efforts, or participate in learning collaboratives to share best practices.

These concepts could also be integrated into a linear penalty scale, if such a change is pursued. Based on the decreasing rate of patient safety events and infections observed since public reporting began for these measures, these changes would acknowledge the work and achievement in improving patient safety by all hospitals and especially safety-net hospitals with limited resources.

CONSIDERATION 2: Consider using existing or new quality improvement programs to provide targeted technical assistance to providers that serve beneficiaries with social risk factors.

The best way to reduce the disproportionate impact of the HACRP on hospitals that disproportionately

serve beneficiaries with social risk factors is to reduce adverse events in those hospitals; this would have a tremendously beneficial impact on the Medicare beneficiaries served by these providers. Targeting existing or new QI efforts could also help prepare hospitals for participating in alternative payment models, under which hospitals may be at greater financial risk for the costs associated with patient safety events.

To that end, CMS should build on learnings from the Partnership for Patients hospital engagement networks and could consider tasking the Quality Improvement Organizations - Quality Improvement Networks (QIO-QINs) to focus on hospitals that disproportionately serve socially at-risk beneficiaries. QIO-QINs can develop and offer targeted resources and technical assistance that addresses risk factors for socially at-risk patients and unique challenges facing safety-net hospitals. Another possibility is for QIO-QINs o partner with patient safety organizations (PSOs) who can aggregate data and share learnings across providers from these relatively rare events. They could expand peer-based collaboratives to address patient safety at safety-net institutions, so that similar hospitals can share best practices and identify effective strategies for their socially at-risk patient populations. A similar collaborative initially run by the Michigan Health & Hospital Association and now spread nationwide has demonstrated remarkable improvements in reducing bloodstream infections and catheter use, though this collaborative did not focus on safety-net providers per se.[25-27]

Additional research may also be needed to determine how best to specifically address the patient safety needs of these high-risk populations; the Agency for Healthcare Research and Quality (AHRQ) could build on its existing research to help develop additional patient safety toolkits targeted to socially at-risk patient populations and safety-net hospitals. For example, AHRQ has developed a toolkit addressing limited English proficiency as one factor in patient safety events.[28]

CONSIDERATION 3: Consider developing demonstrations or models focusing on care innovations that may help achieve low patient safety event rates and/or infection rates for beneficiaries with social risk factors.

Patient safety and quality improvement efforts to date have focused on hospital processes and provider education. Demonstrations and research on care innovations and interventions that specifically address patient safety and infection risk factors in beneficiaries with social risk factors could enhance existing patient safety QI efforts. For example, long-stay nursing home residents or patients who reside in poor neighborhoods with higher community rates of colonization may have a higher risk of infections upon hospitalization; they may benefit from additional infection prevention protocols upon hospital admission. Research to demonstrate the effectiveness of such targeted approaches could inform QI efforts.

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CHAPTER 7: The Hospital Value-Based Purchasing Program

In This Chapter:

- ***Is there a relationship between patient social risk and performance on the metrics that comprise the Hospital Value-Based Purchasing (HVBP) program?***
- ***Is there a relationship between hospital social risk profile and performance on the metrics that comprise the program?***
- ***Are hospitals that serve a high proportion of beneficiaries with social risk factors more likely to receive penalties under this program?***
- ***What impact would policy options, including adjustment and stratification, have on hospitals performance and bonuses or penalties?***

This chapter presents findings on the relationship between beneficiary social risk, hospital social risk, and performance under the Hospital Value-Based Purchasing (HVBP) program.

Key Findings:

Underlying Relationships

- Dually-enrolled beneficiaries had higher spending per care episode, as modeled using the Medicare Spending per Beneficiary parameters; differences were primarily driven by post-acute spending, both in terms of the frequency of use of more expensive settings and the spending within each setting.
- Social risk factors were generally protective for 30-day mortality measures, with the exception of disability and rural status, which were associated with higher mortality at both the beneficiary and hospital level.

Program Impacts

- The worse performance by safety-net hospitals (defined as the top 20% of disproportionate share hospital (DSH) index) on the total HVBP performance score was driven primarily by poor performance on patient experience measures. These hospitals also performed slightly worse than non-safety-net hospitals on process of care measures and efficiency, and on the patient safety components of the outcome domain. However, safety-net hospitals performed equivalently to other hospitals on the mortality components of the outcome domain.

- Safety-net hospitals were more likely to receive penalties and less likely to receive bonuses under HVBP.

Policy Simulations

- Adjusting the MSPB efficiency measure for dual status was associated with slight improvements in performance for safety-net providers.

Strategies and Considerations for HVBP

SUMMARY OF STRATEGIES AND CONSIDERATIONS
STRATEGY 1: Measure and Report Quality for Beneficiaries with Social Risk Factors
CONSIDERATION 1: Consider enhancing data collection and developing statistical techniques to allow measurement and reporting of performance for beneficiaries with social risk factors on key hospital quality and resource use measures.
CONSIDERATION 2: Consider developing key hospital quality and resource use measures and/or statistical approaches suitable for reporting of performance for beneficiaries with social risk factors, where feasible.
CONSIDERATION 3: When feasible, consider developing and introducing a health equity measure or domain into the HVBP program to measure disparities and incent a focus on reducing them.
CONSIDERATION 4: Consider prospectively monitoring for potential unintended consequences. In particular, the cumulative penalties across the three hospital programs for providers that serve beneficiaries with social risk factors should be tracked.
STRATEGY 2: Set High, Fair Standards for All Beneficiaries
CONSIDERATION 1: The measures used in the current HVBP program should continue to be examined to determine if adjustment for social risk factors is appropriate.
CONSIDERATION 2: Program measures should be studied to determine whether differences in health status might underlie the observed relationships between social risk and performance, and whether better adjustment for health status might improve the ability to differentiate true differences in performance between providers.
STRATEGY 3: Reward and Support Better Outcomes for Beneficiaries with Social Risk Factors
CONSIDERATION 1: Consider providing additional financial incentives for achievement and/or improvement in quality and outcomes in beneficiaries with social risk factors.
CONSIDERATION 2: Consider using existing or new quality improvement programs to provide targeted technical assistance to hospitals that disproportionately serve beneficiaries with social risk factors.
CONSIDERATION 3: Consider developing demonstrations or models focusing on care innovations that may help achieve better outcomes for beneficiaries with social risk factors who are hospitalized.

I. Introduction

A. Background

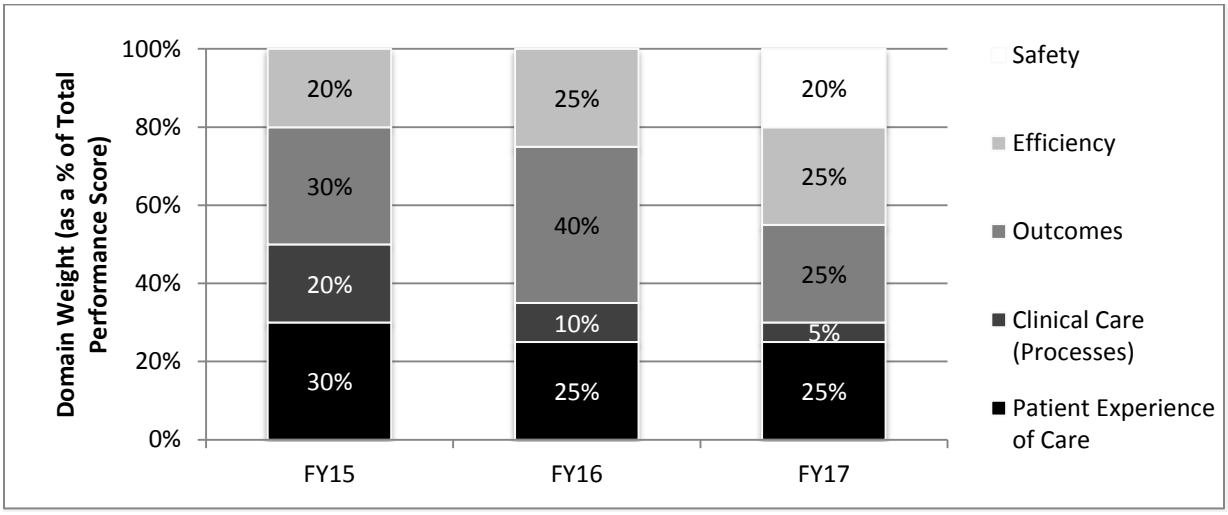
The Hospital Value-based Purchasing program was authorized by section 3001(a) of the Affordable Care Act (ACA) and first started applying value-based incentive payment adjustment factors to the base-operating DRG payment amounts applicable to all discharges of participating hospitals in fiscal year (FY) 2013. The budget-neutral program works by withholding a percentage of hospitals' Medicare payments for inpatient services each year and redistributing the total amount of such withhold to hospitals based on their performance on quality measures. Hospitals can earn back the withheld payment based on performance, so the maximum penalty is the withheld amount, while the bonus for high performance may be greater than the amount withheld. Withholding started at 1% of a hospital's base-operating DRG payments in FY 2013 and increased a quarter of a percent each year, up to a cap of 2% for FY2017 and beyond.

Hospital performance in the HVBP program is assessed on measures grouped into quality domains that assess patient experience (e.g., whether doctors and nurses communicated well), processes of care (e.g. aspirin for a heart attack), clinical outcomes (e.g., mortality for patients admitted with pneumonia), efficiency (costs of care per episode), and safety measures (e.g., in-hospital infection rates). The program included four of these domains from FY 2015 through FY 2016. From FY 2017 onwards, a new domain, patient safety will be added to HVBP, while the Clinical Care domain will now comprise two subdomains, Process and Outcome (previously separate domains). By FY 2018, the four HVBP domains will be equally weighted. For a full list of measures included in each domain, please see the Appendix to this chapter.

For each measure, hospitals are generally scored on both achievement and improvement, with achievement scored on a scale of 1 to 10 based on pre-determined performance thresholds calculated using historical national data (median performance rate) and benchmarks (up to mean of the top decile of national performance). Improvement is also scored on a scale of 1 to 10, based on improvement between the baseline period and the performance period. Hospitals earn the higher of their achievement or improvement points.

Measure scores are summed within each domain, and domain scores are combined to calculate a hospital's Total Performance Score (TPS), which is used to determine penalties and bonuses (Figure 7.1). Although certain parameters are described in statute, the Secretary of Health and Human Services had discretion in designing the scoring methodology for this program.

Figure 7.1. HVBP Domains and Domain Weights, FY 2015-2017



Note that in FY 2015 and FY 2016, the safety measures are included in the "outcomes" domain; in FY 2017 these measures are broken out into their own domain. Over time, the weight of the processes of care ("clinical care") domain has decreased significantly, while the weight of the combined outcomes/safety and efficiency domains have increased.

B. Existing Research on Differences Related to Social Risk in the HVBP Program and its Measures

As the HVBP program has been operational for a number of years, there is a body of existing research related to disproportionate impacts from the program on safety-net hospitals as well as disparities related to patient social risk from component measures. For example, prior work has demonstrated that safety-net hospitals are more likely than other hospitals to be penalized under HVBP, and face larger payment penalties both in terms of absolute dollars and on a per-bed basis.[1-4] Furthermore, disparities may be widening over time, as safety-net hospitals have been shown to improve more slowly than non-safety-net hospitals.[5] Some researchers have raised concerns that the scoring methodology of HVBP program may inherently disadvantage hospitals who serve the most vulnerable as it applies an "elastic ruler" that does not evenly score absolute improvements.[6] Others have pointed out that performance on these programs may have financial impacts beyond the program penalties themselves: credit rating agencies such as Fitch and Moody's have indicated they will also incorporate performance on patient experience ratings used in the HVBP program into hospital bond ratings.[7] In response, some have recommended assigning rewards specifically to reduce disparities, as well as risk-adjustment and stratified analyses.[1,8-10]

On the other hand, it is feasible that pay-for-performance programs may have the potential to reduce disparities by incenting improved care in the safety-net: a study of the Premier hospital pay-for-performance program, a precursor to HVBP, found mortality disparities for Blacks with congestive heart failure decreased more in hospitals subject to pay-for-performance than control hospitals.[11]

Clinical Processes of Care: In terms of specific domains and measures, prior studies have shown that safety-net hospitals, as well as those serving high proportions of Black or Hispanic beneficiaries, perform worse on processes of care.[4,5,12-14]

Patient Experience: Hospitals currently use the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey to assess patient experience. Survey methodology already adjusts for many social risk factors such as patient education level, primary language, and self-reported health status,[15] However, patients who are racial and ethnic minorities report worse patient experience, some of which is related to the poorer quality of hospitals in which these patients tend to seek care.[15,16]

Patient Outcomes: On outcome measures, findings are more mixed: prior studies have shown significantly lower mortality following acute myocardial infarction, heart failure, and pneumonia for Black and Hispanic Medicare beneficiaries; findings are particularly striking for Hispanics, with up to 50% lower cardiovascular mortality reported in multiple studies.[17-21] For individual poverty, some studies have shown higher mortality following hospitalization, while others have demonstrated no differences; safety-net hospitals and hospitals serving racial and ethnic minorities often report lower mortality rates.[3,4,18,22,23]

Rural patients and rural hospitals have generally been demonstrated to have higher mortality rates,[24-26] though here again findings have been somewhat mixed.[27] The availability of cardiologists, which tends to be significantly lower in rural areas, may also influence mortality rates for low-income patients hospitalized for AMI and HF.[28]

Efficiency/Resource Use: The Medicare Spending per Beneficiary (MSPB) measure is currently the sole measure in the Efficiency domain in the HVBP program, but additional condition-specific cost measures for heart attack (AMI) and heart failure episodes will be added in FY2021. The current MSPB measure assesses a hospital's spending compared to the national average for an episode that starts 3 days prior to admission and ends 30 days after discharge. As the measure is new, there is relatively little published research on patterns in performance. MedPAC has reported no differences in MSPB based on a hospital's proportion of patients on SSI and found wide variation in spending related to post-acute care, but did not examine patient-level spending.[29] Many prior studies have shown that dually-enrolled beneficiaries have higher overall spending than non-dually-enrolled beneficiaries, though not in the context of this particular metric.[30,31]

C. Limitations

Similar to the other chapters in this report, social risk factors assessed in this chapter are limited to those currently available in the Medicare enrollment data, including dual enrollment status, disability, urban/rural location, race and ethnicity, and Census-based community information at the Zip Code Tabulation Areas (ZCTA) level such as median household income and poverty rate. Inpatient claims data and Medicare enrollment data do not include other social risk factors such as social support, educational level, or health literacy, which will be further explored in a later study ("Study B") by the Assistant Secretary for Planning and Evaluation (ASPE).

Another limitation specific to this chapter concerns the measure areas that are not explored in detail here: processes of care and patient experience. These areas are omitted for several reasons. First, process of care measures are not typically adjusted for patient factors, whether clinical or social, because they are considered to involve actions equally relevant for all patients; one example is providing

aspirin for patients having a heart attack. For patient experience of care measures, HCAHPS already adjusts for social risk factors, including race and ethnicity, level of education, self-rated health, and language spoken at home, all of which have been shown to be associated with patients' ratings of their health care experiences;[32,33] thus, social risk factors were not further explored in this setting. As a result, the analyses and policy simulations contained in this chapter only target two of the five program domains: clinical outcomes (including safety) and efficiency. The patient safety measures currently in the HVBP program (originally in the clinical outcomes domain, but moved to the safety domain for FY 2017) are the same measures contained in the Hospital-Acquired Conditions Reduction Program (HACRP), with minor differences in specifications, so these measures are explored in Chapter 6 under the HACRP in detail, and in this chapter to a lesser degree.

Finally, the choice of definition for safety net hospital that was used in this chapter is not a universal one; other researchers may choose to define this group differently, and results could differ as a result.

D. Framework for the Chapter: Analytic Findings, Policy Simulations, Strategies, and Considerations

The remainder of this chapter is structured as follows. First, it describes underlying relationships between social risk and performance on the measures contained in the HVBP program. Next, it examines the performance of providers serving beneficiaries with social risk factors on these measures, and then the composite performance of these providers under the HVBP program penalty and bonus scheme. Following these analytic sections, a series of policy simulations are presented, focusing on adjustment and changes to the patient safety domain. Finally, strategies and considerations for HVBP are presented, using the strategic framework outlined in Chapter 1: 1) Measure and report quality for beneficiaries with social risk factors; 2) Set high, fair standards for all beneficiaries; and, 3) Reward and support better outcomes for beneficiaries with social risk factors. These three strategies build on each other to address social risk in Medicare payment programs.

II. Beneficiary and Provider Characteristics

Because this chapter includes multiple measures, beneficiary and provider characteristics are shown below for the broadest of them: the Medicare Spending per Beneficiary (MSPB) efficiency measure, described in more detail later in the chapter. Characteristics for the mortality measures, which are comprised of a subset of the beneficiaries and hospitals included in the MSPB, can be found in the Appendix to this chapter.

A. Beneficiary Characteristics

Beneficiary characteristics are presented below for Medicare beneficiaries eligible for the MSPB measure, which nearly includes all inpatient stays. About one third are dually enrolled in Medicaid and Medicare, 30% are disabled, nearly one in six beneficiaries live in low-income neighborhoods (17%) and one fifth live in rural areas (21%). Black beneficiaries make up 12% and Hispanics comprise 6% of all inpatient stays. There is significant overlap between social risk groups; for example, almost 55% of

dually-enrolled beneficiaries originally qualified for Medicare on the basis of a disability rather than age. Table 7.1 shows beneficiary characteristics overall and by social risk group.

Table 7.1. Beneficiary Characteristics by Social Risk Group

Beneficiary Characteristics	All	Dually enrolled	Originally entitled to Medicare due to disability	Black	Hispanic	Low-Income ZCTA	Rural
N Stays	3,582,596	1,162,677	1,061,751	425,037	211,668	602,499	759,032
% All stays	100%	32.5%	29.6%	11.9%	5.9%	16.8%	21.2%
% Male	43.5%	38.9%	47.8%	42.2%	44.0%	43.3%	44.5%
% Dually enrolled	32.5%	100%	59.4%	60.0%	68.4%	50.9%	33.2%
% Originally entitled to Medicare due to disability	29.9%	55.2%	100.0%	50.4%	37.9%	42.2%	32.7%
% Black	12.1%	22.4%	20.2%	100%	0%	29.6%	8.1%
% Hispanic	6.0%	12.7%	7.6%	0%	100%	9.9%	2.5%
% Low Income ZCTA	16.8%	26.5%	23.7%	41.3%	27.6%	100.0%	28.6%
% Rural	21.2%	21.7%	23.3%	14.2%	8.9%	35.8%	100%
% High Complexity*	20.0%	28.4%	26.8%	29.8%	26.1%	23.2%	17.3%

*=High complexity is defined as the highest 20% of total Hierarchical Condition Category risk score based on a 90-day look-back period as used in the risk-adjustment of the MSPB measure. ZCTA=ZIP code tabulation area

B. Hospital Characteristics

Table 7.2 shows the beneficiary populations and structural characteristics of hospitals in the HVBP program. The characteristics of hospitals that predominantly serve beneficiaries with social risk factors are shown (in each case, the top 20% share of the social risk factor). Safety-net hospitals (here defined as those with the top 20% share of DSH payment) serve a higher proportion of beneficiaries that are dually-enrolled, qualified for Medicare on the basis of a disability, Black, and Hispanic, but less often rural. These hospitals are more likely to be larger (300+ beds), major teaching institutions, publicly funded, and located in the South and West:

Table 7.2. Hospital Characteristics by Social Risk Group

Hospital Characteristic	All	Safety-Net (High-DSH)	High-Disabled	High-Black	High-Hispanic	Low Income ZCTA	Rural (non-MSA) Hospital
Beneficiary Population							
% Dually enrolled	32.5%	49.7%	47.3%	40.7%	45.1%	46.7%	36.1%
% Originally entitled to Medicare due to disability	29.9%	37.0%	44.0%	36.6%	30.6%	39.3%	32.9%
% Black	12.1%	21.9%	21.5%	34.0%	13.1%	23.2%	8.1%
% Hispanic	6.0%	15.7%	4.0%	4.9%	23.1%	9.2%	2.3%
% Low Income ZCTA	16.8%	28.3%	39.1%	30.5%	17.8%	54.0%	27.1%
% Rural	21.2%	17.1%	44.8%	19.6%	7.0%	42.9%	77.7%
% High Complexity	20.0%	23.3%	21.1%	22.9%	23.5%	21.3%	17.6%
Structural Characteristics							
Number of Hospitals	3051	613	559	580	578	529	883
Size: large (300+ beds)	24.9%	38.8%	16.5%	37.9%	33.2%	20.2%	3.6%
Size: medium (299-100 beds)	44.5%	42.4%	45.8%	39.7%	46.2%	43.1%	40.1%
Size: small (99-0 beds)	29.8%	18.8%	37.2%	21.7%	19.6%	36.3%	55.8%
Teaching Hospital	8.8%	20.9%	7.0%	18.7%	12.8%	8.6%	0.5%
Ownership: non-profit	60.2%	49.4%	44.0%	50.9%	50.3%	43.3%	53.0%
Ownership: for-profit	25.1%	26.4%	30.4%	24.5%	32.0%	30.8%	22.3%
Ownership: public	14.7%	24.1%	25.6%	24.7%	17.6%	25.9%	24.7%
Safety-net (top quintile DSH)	20.1%	100.0%	39.5%	43.4%	51.9%	42.2%	16.1%
Region: Northeast	15.7%	13.9%	7.7%	10.5%	10.9%	4.9%	9.9%
Region: South	39.4%	44.0%	65.5%	61.7%	31.0%	69.9%	50.7%
Region: Midwest	23.7%	11.9%	15.2%	16.9%	6.2%	15.5%	25.5%
Region: West	18.8%	29.0%	9.3%	7.4%	49.7%	7.0%	12.2%
Average Case Mix Index	1.54	1.52	1.36	1.52	1.59	1.38	1.32

DSH=disproportionate share index; MSA=metropolitan statistical area; ZCTA=ZIP code tabulation area

III. Social Risk and Performance on the Medicare Spending per Beneficiary Efficiency Measure

The Medicare Spending per Beneficiary (MSPB) measure assesses a hospital's average spending per Medicare beneficiary for a care episode around an inpatient stay, relative to the national average. An episode includes three days prior to the index hospitalization up to 30 days post-discharge, and costs are calculated using claims for Medicare Part A and B services. Costs are price-standardized to remove

geographical variations, so that the measure reflects differences in utilization. The measure is reported as a ratio of the hospital's MSPB amount divided by the national median spending. The hospital MSPB amount is calculated by taking the hospital's average spending amount, divided by the average expected spending amount, and then multiplied by the average spending for all episodes across all hospitals. Predicted spending amounts are calculated separately for each of 25 major diagnostic conditions (MDCs) and then combined to calculate a hospital's overall MSPB ratio. The measure is adjusted for age, sex, severity of illness (using Medical Severity Diagnosis Related Groups, or MS-DRGs), and comorbidities based on a 90-day look-back for 70 hierarchical condition categories (HCCs) (i.e. comorbidities that were coded in claims data during the 90 days prior to the beginning of the episode), and also contains interaction terms for disability and end-stage renal disease (ESRD) status.

The MSPB measure was first introduced into the HVBP program for the FY 2015 program year and was the sole resource use measure in the HVBP program's Efficiency domain during the program years analyzed for this Report. As with other measures in the HVBP program, scores for this measure are based on the higher of a hospital's achievement or improvement scores for the measure. For FY 2015 HVBP program payments, hospitals' performance in 2013 and their improvement between 2011 and 2013 were used to score hospitals on the MSPB measure.

A. Individual Beneficiary Social Risk and MSPB Ratios

This analysis first aimed to examine the relationship between individual beneficiaries' social risk and MSPB spending ratios, modeled after the methodology for hospital-level MSPB spending ratios.[ix] It was also important to determine the degree to which any higher spending seen in beneficiaries with social risk factors might simply reflect higher medical risk or worse functional status, which may drive higher spending for an inpatient episode without being captured by the measure's current risk adjustment. To assess this potential relationship, this analysis included two additional factors: first, disability as the original reason for Medicare entitlement; and second, medical complexity as defined using the highest quintile of HCC risk scores derived from the 90-day look-back of Medicare claims within the measure's risk-adjustment model.

Analyses of the relationship between each social risk factor (as well as medical complexity) and MSPB are shown in Table 7.3. Regression models for each social risk factor were run separately using GEE models to estimate the total effect and random effects models to estimate the within-hospital effect of the beneficiary's social risk. Dually-enrolled beneficiaries were 4% more expensive than non-dually-enrolled beneficiaries, even within the same hospitals. Disabled and medically complex beneficiaries were 1-2% more expensive than non-disabled, non-complex beneficiaries within the same hospital. Rural beneficiaries were also 1% more expensive. Hispanic beneficiaries were 5% less expensive than

[ix] Stay-level MSPB spending ratio= (standardized spending amount)/ (predicted spending amount), where standardized episode payment amount is the episode spending after claim payments in each episode has been standardized for geographic variation and predicted episode payment amount is the expected episode spending determined through risk adjustment, after it has been censored, and outliers have been excluded. Predicted episode payment amount is the expected episode spending determined through risk adjustment, after it has been truncated, and outliers have been excluded. Details are available in the Appendix.

non-Hispanics, and there was no difference in spending for Blacks or beneficiaries living in the poorest neighborhoods.

Table 7.3. Relationship Between Each Beneficiary Social Risk or Medical Complexity and MSPB Spending Ratios

	MSPB Ratio, by Beneficiary Social Risk		Effect of Social Risk on MSPB Spending Ratio, %	
Beneficiary Social Risk Factor	**Socially at-risk Beneficiaries**	**Other Beneficiaries**	**Total Effect[1] for Social Risk**	**"Within-hospital" Beneficiary Effect of Social Risk[2]**
Dually enrolled	1.03	0.98	**4%**	**4%**
Low ZCTA Income	1.00	1.00	0%	0%
Black	1.00	1.00	**1%**	0%
Hispanic	0.98	1.00	**2%**	**-5%**
Rural	0.98	1.00	**-3%**	**1%**
Originally entitled to Medicare due to disability[3]	1.00	1.00	**1%**	**1%**
Medically Complex	1.02	0.99	**2%**	**2%**

Bolded terms are significant at p<0.01. Each model was run separately. ZCTA=ZIP Code Tabulation Area; MSPB=Medicare Spending Per Beneficiary

1. Total effect on spending ratio due to beneficiary social risk and hospital where care is received, from generalized estimating equation (GEE) regression models.

2." Within-hospital effect" on spending ratios due to beneficiary social risk within the same hospital, estimated using random effects regression models

3. The MSPB measure includes disability and 5 disability interaction terms in the clinical risk-adjustment. To estimate the effect of disability on spending, these results were produced using the risk adjustment model without disability, and the interaction terms.

When dual enrollment and medical complexity were entered into the same beneficiary-level model, the effect associated with dual enrollment remained unchanged at 4% higher spending, while the effect associated with medical complexity dropped from 2% to 1% (see Supplement for additional analyses). These findings suggest that dual enrollment explains some of the relationship between medical complexity and spending, but that the effect of dual enrollment is independent of medical complexity as captured in current HCCs.

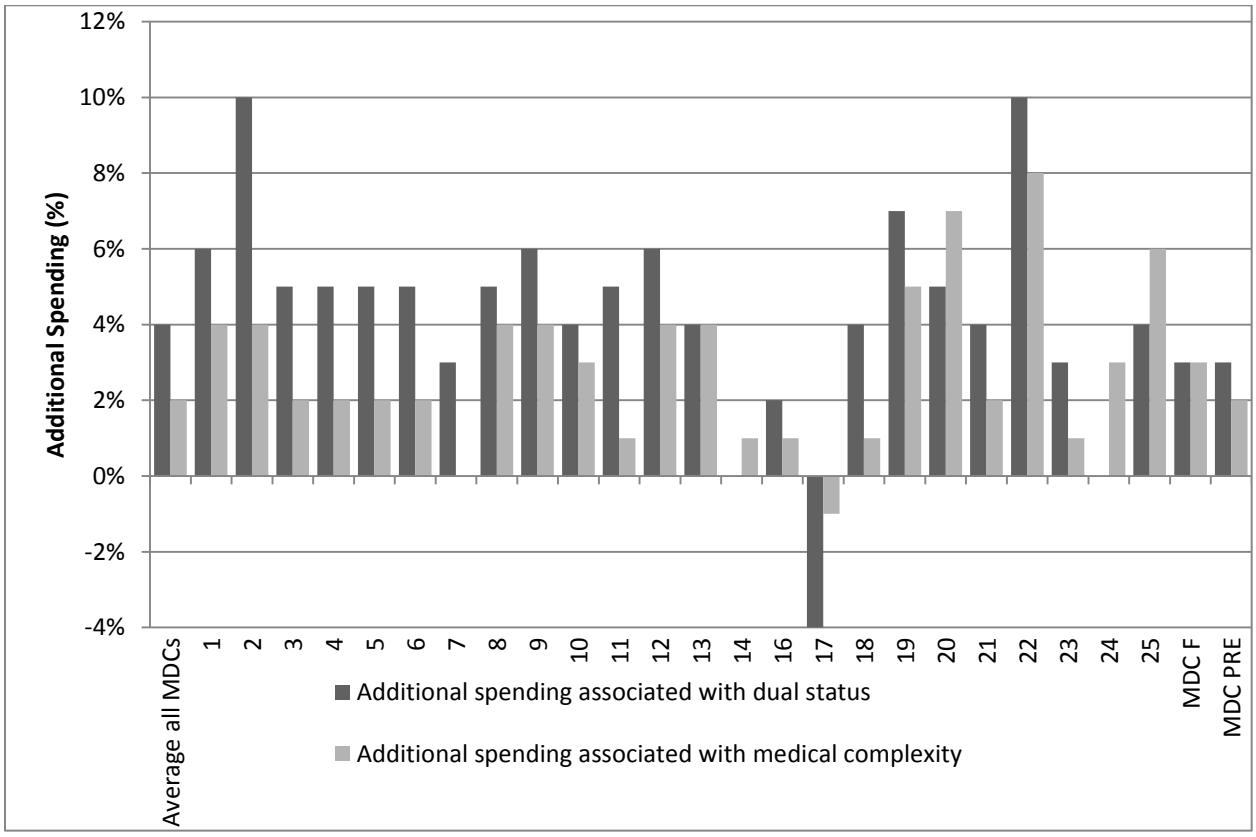
However, preliminary analyses using a claims-based frailty index to identify beneficiaries who may suffer from frailty demonstrate that frailty is in part responsible for the observed higher spending in dually-enrolled beneficiaries. This finding suggests that some of the effect currently captured by the indicator of dual enrollment may be picking up differences in medical risk – including frailty – which are beyond providers' control and should be adjusted for (see the Appendix to this chapter for preliminary findings on frailty and MSPB spending ratios). This will be further investigated in Study B.

B. Consistency of Spending Differences by Social and Medical Risk Across Conditions

As mentioned earlier, predicted episode spending is calculated separately for 25 major diagnostic conditions (MDCs). The 4% higher spending for dually-enrolled beneficiaries and 2% higher spending for medically complex beneficiaries shown in Table 7.3 above represents an average across all MDCs; therefore, an important question was whether this was driven by a consistent relationship across many MDCs, or by one or two MDCs with particularly high differences in spending for dually-enrolled or medically complex beneficiaries.

When examined separately across each of the MDCs, a consistently higher episode spending for dually-enrolled and medically complex beneficiaries was seen; the highest effects associated with dual enrollment were for burns (MDC 22, 10% higher spending) and mental health conditions (MDC 19, 7% higher spending). Conditions where no positive or negative effect with dual enrollment was found include pregnancy (MDC 14) and trauma (MDC 24). Myeloproliferative disorders (MDC 17) was the only condition category where dually-enrolled beneficiaries had lower spending than non-dually-enrolled beneficiaries (-4%, $p<0.001$). As seen in Figure 7.2, higher spending associated with medical complexity (red lines) tracked closely to the patterns of higher spending associated with dual enrollment status (blue lines), though the impact of dual enrollment status was generally stronger.

Figure 7.2. Consistency of Relationship Between Dual enrollment status or Medical Complexity and MSPB Spending Across Major Diagnostic Categories (MDCs)



These findings show that the higher spending seen in dually-enrolled beneficiaries is consistent and driven by higher spending across many conditions, rather than a single or small group of conditions.

C. Spending by Care Setting

It was next important to determine whether the higher price-standardized spending seen in beneficiaries at high social risk was related to spending across all care settings (pre-hospital services, inpatient, post-acute, and outpatient) or whether it was related to higher spending in a particular setting. Table 7.4 shows standardized spending broken down by site of care, demonstrating that the 4% higher total spending for dually-enrolled beneficiaries was driven primarily by higher spending in the post-acute setting, both in terms of the proportion of individuals using post-acute inpatient and skilled nursing care (about 5% higher post-acute inpatient care and about 3% higher post-acute SNF care, in addition to 6% lower home health care) and in spending per post-acute encounter (about $1400 in absolute terms). Additional analyses examining differences between predicted and actual spending in each setting are shown in the Appendix to this chapter.

Table 7.4. Spending by Care Setting

Setting Type	Proportion of Group That Utilizes Setting			Average Spending in Setting, Among Utilizers Only		
	Dually Enrolled	Not Dually Enrolled	Difference	Dually Enrolled	Not Dually Enrolled	Difference
Pre-Hospital	93%	87%	**6%**	$754	$691	**$64**
Hospital Stay	100%	100%	0%	$9,857	$10,954	**-$1,097**
Post-Acute Total (all components below)	97%	97%	0%	$9,617	$8,189	**$1,428**
Post-Acute Components:						
Post-Acute Inpatient*	23%	18%	**5%**	$13,122	$13,490	**-$369**
Post-Acute SNF	25%	22%	**3%**	$14,024	$12,980	**$1,044**
Post-Acute HH	21%	28%	**-6%**	$2,807	$2,911	**-$104**
Post-Acute Outpatient	58%	54%	4%	$1,389	$1,126	**$262**

*: Includes readmissions, inpatient rehabilitation, and long-term care hospital stays
Bolded differences are significant at p<0.01
HH=home health; SNF=skilled nursing facility.

Thus, these analyses suggest that the higher MSPB spending for dually-enrolled beneficiaries is due both to dually-enrolled beneficiaries going to higher-intensity post-acute settings (i.e. skilled nursing home rather than home health care) as well as higher spending in these settings. For example, analyses showed over $1,000 more was spent on skilled nursing facilities (SNFs) for dually-enrolled beneficiaries than other beneficiaries who used SNF care, which may reflect additional SNF payments for longer stays, or higher daily payments based on beneficiary need (SNFs are paid per-diem, with rates based on beneficiary resource use groups, or RUGs). Dually-enrolled beneficiaries were 5% more likely to use inpatient care in the post-acute period, which likely reflects both higher readmission rates (as presented in Chapter 4) and greater use of inpatient rehabilitation facilities and long-term care hospitals.

IV. Hospital Social Risk Makeup and MSPB Ratios

The next analyses aimed to determine whether there was a hospital effect of caring for beneficiaries with social risk factors on MSPB spending ratios. Spending was examined for all individuals in a hospital with a high proportion of beneficiaries with social risk factors, irrespective of the beneficiaries' individual risk. These beneficiary-level analyses showed that beneficiaries who obtain care at high-dual, high-Black, high-Hispanic, and high-complex hospitals all had slightly higher spending, but when individual beneficiaries' social risk was included in the same regression model as hospital social risk (i.e. separately from the clinical risk-adjustment model), the hospital effect for high-dual and rural hospital location was no longer significant (Table 7.5). Thus, the higher spending seen at high-dual hospitals is primarily related to beneficiary social risk factors (i.e. dually enrolled and rural beneficiaries) rather than hospital effects. However, there was no change to the effect of hospital social risk after including other beneficiary social risk factors in the regression model.

Table 7.5. Relationship Between Hospital Social Risk or Medical Complexity and MSPB Ratios

	MSPB Ratio, by Hospital Social Risk		Effect of Social Risk on MSPB Ratio, %	
Hospital Social Risk Factors	**Beneficiaries at Hospitals Serving Socially At-Risk Beneficiaries**	**Beneficiaries at Other Hospitals**	**Effect of Hospital Social Risk**	**Effect of Hospital Social Risk, Controlling for Beneficiary Social Risk**
High-dual	1.01	1.00	**1%**	0%
ZCTA low income	0.99	1.00	**-1%**	**-1%**
High-Black	1.00	1.00	**2%**	**2%**
High-Hispanic	1.02	0.99	**3%**	**4%**
Rural	0.96	1.01	**-4%**	**-6%**
High-Disabled	0.99	1.00	**-1%**	**-1%**
High-Complex	1.03	0.99	**5%**	**5%**

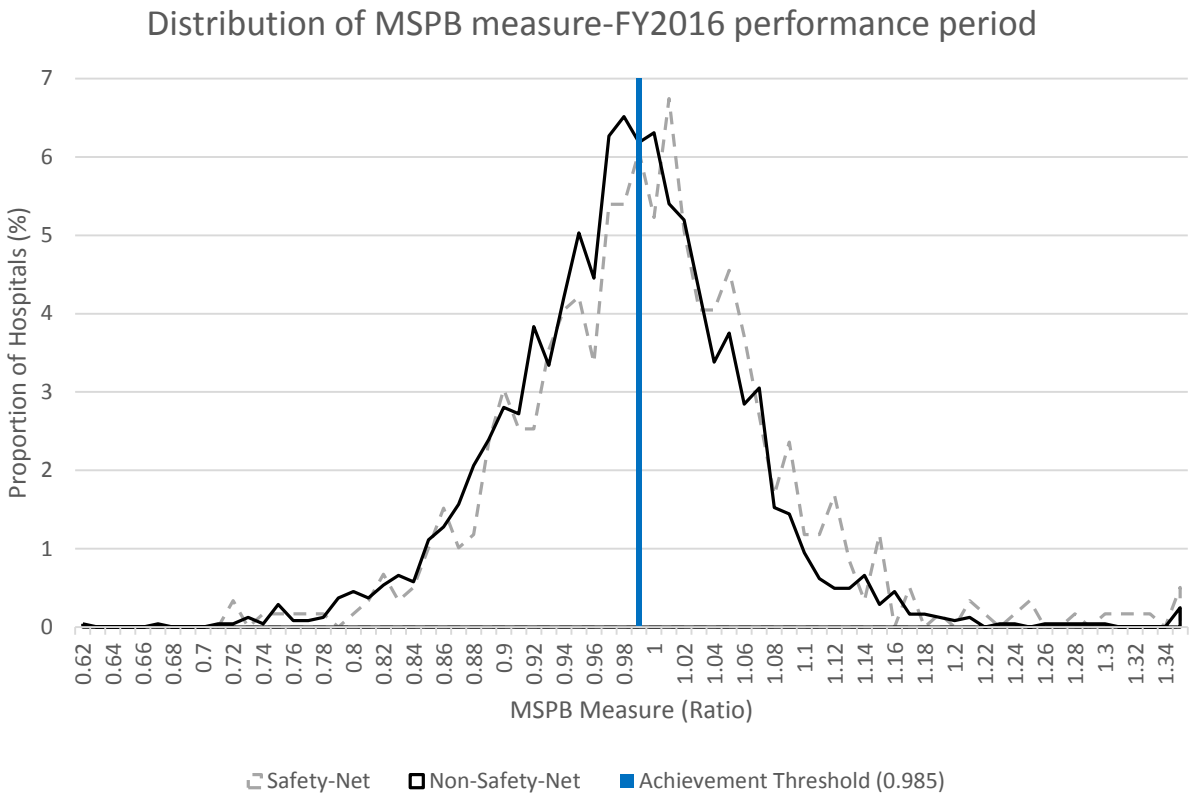
Bolded terms are significant at p<0.01. Estimated from random effects models. Each model was run separately.
ZCTA=ZIP Code Tabulation Area; MSPB=Medicare Spending Per Beneficiary

In sum, these analyses demonstrate a significant relationship between dual enrollment status and higher spending on the MSPB, predominantly driven by the higher likelihood of dually-enrolled beneficiaries to use more expensive post-acute care settings, and to have higher charges during their stays in these settings. The higher spending seen for dually-enrolled beneficiaries is largely independent of medical complexity, at least as measured by high HCC scores in a 90-day look-back. These analyses cannot determine whether this additional post-acute spending is appropriate or inappropriate, but given prior findings demonstrating that dually-enrolled beneficiaries are more likely to have poor cognitive and physical function, and to lack caregiver support at home and thus require institutional care,[34,35] this may represent true differences in need rather than over-use of care.

The higher spending observed for dually-enrolled beneficiaries translates into MSPB ratios that are higher on average at hospitals that serve a higher proportion of dually-enrolled beneficiaries, such as safety-net hospitals. The FY 2016 MSPB performance distribution for safety-net hospitals is shifted to the right (higher spending) and has higher reported ratios in the tails of the distribution compared to

other hospitals, as seen in Figure 7.3 (distribution statistics and box plots in the Appendix to this chapter). However, the distributions of performance overlap significantly, as shown below; there are a number of safety-net hospitals that do well on spending despite their patient population.

Figure 7.3. Distribution of MSPB measure performance by safety-net (high DSH) and other hospitals



V. Beneficiaries' and Hospitals' Social Risk and Mortality Measures

The next domain in the HVBP program is the outcomes domain, which includes the condition-specific 30-day mortality measures for beneficiaries with acute myocardial infarction (AMI), heart failure (HF) and pneumonia (PN). These measures are calculated as risk-standardized mortality rates, and are risk-adjusted for age, sex, and clinical co-morbidities using hierarchical regression models with a one year look-back period and a hospital-specific intercept. The risk-adjustment does not include any patient social risk factors. Beneficiaries in hospice or who were discharged against medical advice or transferred from another facility are excluded from the measures. The mortality rates are reported and used as survival rates (i.e. 1- mortality rate) for the purposes of determining HVBP scores.

Medicare claims data for the 2010-2011 baseline period and the 2012-2013 performance period (used for the FY 2015 program year) were linked to patient social factors from Medicare enrollment data were used in the analysis to explore relationships between mortality rates and social risk factors.

Rates and odds of mortality for beneficiaries with AMI, HF and PN were calculated for each of the social risk factors of interest. For dually-enrolled beneficiaries, raw mortality rates were higher for AMI and PN, though lower for HF. However, after risk-adjustment, dual enrollment status was associated with significantly lower odds of mortality for HF and PN (Table 7.6). Beneficiaries with disabilities and those in rural areas had higher odds of mortality, while Black and Hispanic beneficiaries demonstrated markedly lower odds of mortality.

Table 7.6. Beneficiary Social Risk and Condition-Specific Mortality Rates (AMI, HF, PN)

Conditions	Observed Mortality Rates		Odds of Mortality		
	Dually Enrolled	Not Dually Enrolled	Raw[1]	Risk-Adjusted[1]	Within-Hospital Random Effect[2]
AMI	15.3%	13.0%	**1.21**	1.00	1.00
HF	10.9	12.3	**0.87**	**0.86**	**0.87**
PN	11.9	11.6	**1.04**	**0.95**	**0.95**
Black	**Black**	**Non-Black**	**Raw**	**Risk-Adjusted**	**Random Effect**
AMI	12.4	13.6%	**0.90**	**0.87**	**0.86**
HF	7.6	12.5	**0.58**	**0.66**	**0.66**
PN	10.9	11.7	**0.92**	**0.87**	**0.85**
Hispanic	**Hispanic**	**Non-Hispanic**	**Raw**	**Risk-Adjusted**	**Random Effect**
AMI	8.9	13.7%	**0.62**	**0.63**	**0.61**
HF	6.6	12.2	**0.51**	**0.54**	**0.55**
PN	6.8	11.9%	**0.54**	**0.57**	**0.56**
Rural	**Rural**	**Non-Rural**	**Raw**	**Risk-Adjusted**	**Random Effect**
AMI	12.9	13.7	**0.93**	**1.07**	**1.06**
HF	12.4	11.9	**1.05**	**1.16**	**1.13**
PN	12.0	11.5	**1.05**	**1.16**	**1.14**
Low ZCTA Income	**Low Income**	**Non-Low Income**	**Raw**	**Risk-Adjusted**	**Random Effect**
AMI	13.77	13.5	1.02	**1.07**	**1.05**
HF	10.6	12.2	**0.85**	**0.92**	**0.92**
PN	11.7	11.7	1.01	**1.04**	1.01
Disability	**Disabled**	**Non-Disabled**	**Raw**	**Risk-Adjusted**	**Random Effect**
AMI	12.4	13.7%	**0.89**	**1.23**	**1.23**
HF	9.9	12.3	**0.78**	**1.09**	**1.09**
PN	9.7	12.0	**0.78**	1.02	1.01

Bolded values are significant at p<0.05.
1. Total effect on mortality associated with beneficiary social risk, estimated from generalized estimating equation (GEE) regression models. Raw rates refer to the CMS mortality measure without clinical risk-adjustment. Risk-adjusted rates are the reported CMS mortality rates with the clinical risk-adjustment applied. Comparing the raw and risk-adjusted rates shows how the clinical risk-adjustment explains some or all of the observed relationship with the risk factor of interest.
2. Random effect or "within-hospital effect" on mortality associated with beneficiary social risk within the same hospital, estimated using random effects regression models.

V. Hospital Social Risk and Mortality Measures

The next set of analyses examined whether there was a relationship between a hospitals' level of beneficiaries with social risk factors and outcomes. Overall, these analyses demonstrate mixed associations between hospital social risk levels and mortality rates, with rural hospitals performing notably worse than other hospitals for all three conditions and high-disabled hospitals performing worse for two of the three conditions (Table 7.7). Models incorporating both hospital and beneficiary social risk characteristics were largely similar and are shown in the Appendix to this chapter.

Table 7.7. Hospital Social Risk and Condition-Specific Mortality Rates (AMI, HF, PN)

Conditions	Observed Mortality Rates		Odds of Mortality	
Top 20% DSH	**Top 20% DSH**	**Bottom 80% DSH**	**Raw**	**Risk-Adjusted**
AMI	13.8%	13.4%	1.04	1.01
HF	10.8%	12.2%	**0.87**	**0.88**
PN	11.9%	11.6%	1.03	0.98
High Black	**High Black**	**Non-High Black**	**Raw**	**Risk-Adjusted**
AMI	13.5%	13.5%	1.00	1.02
HF	10.6%	12.3%	**0.84**	**0.89**
PN	12.2%	11.6%	**1.06**	**1.04**
High Hispanic	**High Hispanic**	**Non-High Hispanic**	**Raw**	**Risk-Adjusted**
AMI	14.0%	13.4%	**1.05**	0.96
HF	11.0%	12.2%	**0.89**	**0.85**
PN	11.5%	11.7%	0.98	**0.90**
Rural Hospital	**Rural Hospital**	**Non-Rural Hospital**	**Raw**	**Risk-Adjusted**
AMI	14.8%	13.3%	**1.14**	**1.11**
HF	12.7%	11.8%	**1.08**	**1.14**
PN	12.1%	11.5%	**1.06**	**1.16**
Low ZCTA Income	**Low Income**	**Non-Low Income**	**Raw**	**Risk-Adjusted**
AMI	14.1%	13.4%	**1.07**	**1.09**
HF	11.1%	12.1%	**0.91**	0.97
PN	12.0%	11.6%	**1.04**	**1.08**
High Disabled	**High Disabled**	**Non-High Disabled**	**Raw**	**Risk-Adjusted**
AMI	13.8%	13.4%	1.03	**1.07**
HF	11.3%	12.1%	**0.93**	1.00
PN	12.0%	11.6%	**1.04**	**1.11**

Bolded values are significant at $p<0.05$.

Odds ratios estimated from generalized estimating equation (GEE) regression models. Raw rates refer to the CMS mortality measure without clinical risk-adjustment. Risk-adjusted rates are the reported CMS mortality rates with the clinical risk-adjustment applied. Comparing the raw and risk-adjusted rates shows how the clinical risk-adjustment explains some or all of the observed relationship with the risk factor of interest.

VI. Social Risk and Performance Under the HVBP

Tables 7.8 through 7.10 show the impact of the HVBP program on hospitals' measure scores, domain scores, overall scores, and payments for FY 2015 and/or FY 2016 scores; these program-level analyses focus on safety-net hospitals. Table 7.8 shows measure rates (hospitals' performance on each measure) and scores (performance is translated into scores using linear exchange functions, and hospitals are assigned the higher of their achievement or improvement scores). The Patient Experience of Care domain did not report performance rate in the dataset used for this analysis, so only scores are included.

These analyses show that safety-net hospitals, defined as those in the top 20% of DSH Index, performed significantly worse than non-safety-net hospitals on safety measures, process measures, and the efficiency measure, but better or equivalently to non-safety-net hospitals on mortality measures. In the case of the process measures, though safety-net hospitals performed worse, performance was very high overall across measures (93.2% compliance or higher for all measures in safety-net hospitals; 94.0% or higher in non-safety-net hospitals) and absolute differences between hospital groups were small.

When these performance rates were translated into scores, worse performance was seen on safety and process measures for safety-net hospitals. Additionally, safety-net hospitals performed worse than non-safety-net hospitals on all 8 measure scores in the patient experience domain:

Table 7.8: FY2015 Measure Rates and Scores, by Hospital Safety-Net (top 20% DSH) Status

Domain (as of program year FY2015)	Measure	Rate (performance)			Score (better of improvement or achievement, higher is better)		
		Safety-Net (top 20% DSH, N=613)	Non-Safety-Net (N=2438)	Difference	Safety-Net (top 20% DSH)	Non-Safety-Net	Difference
Patient Experience of Care	Nurse Communication	NR	NR	NR	2.2	3.5	**-1.3**
	Doctor Communication	NR	NR	NR	2.1	2.8	**-0.6**
	Hospital Staff Responsiveness	NR	NR	NR	1.8	3.1	**-1.3**
	Pain Management	NR	NR	NR	2.1	2.9	**-0.8**
	Medicine Communication	NR	NR	NR	2.6	3.5	**-0.9**
	Hospital Cleanliness & Quietness	NR	NR	NR	2.0	2.8	**-0.8**
	Discharge Information	NR	NR	NR	3.2	5.2	**-2.0**
	Overall Hospital Rating	NR	NR	NR	1.9	3.3	**-1.4**
Outcomes (includes patient safety)	AMI Mortality	14.6%	14.5%	0.0%	5.4	5.7	-0.3
	HF Mortality	11.8%	12.1%	**0.3%**	2.9	2.4	**0.5**
	PN Mortality	11.6%	11.7%	0.0%	3.4	3.4	0.0
	PSI-90	0.52	0.50	**0.02**	6.7	7.0	**-0.3**
	CLABSI	0.60	0.49	**0.10**	3.5	4.2	**-0.7**
Efficiency	Medicare Spending Per Beneficiary (MSPB)	0.99	0.98	**0.01**	2.0	2.1	-0.1

Bolded values are significant at p<0.05. HVBP scores reported by CMS. AMI=acute myocardial infarction; CLABSI=central line-associated bloodstream infection; DSH=disproportionate share hospital; HF=heart failure; NR=not reported (only scores, not measure rates, were publicly available for analysis at the time of this Report's writing); PN=pneumonia; PSI-90 is the patient safety composite from AHRQ.

Table 7.8 (continued): FY2015 Measure Rates and Scores, by Hospital Safety-Net (top 20% DSH) Status

Domain (as of program year FY2015)	Measure	Rate (performance)			Score (better of improvement or achievement, higher is better)		
		Safety-Net (top 20% DSH, N=613)	Non-Safety-Net (N=2438)	Difference	Safety-Net (top 20% DSH)	Non-Safety-Net	Difference
Processes of Care	**Fibrinolytic Therapy Within 30 Minutes of Hospital Arrival**	81.8%	-	-	1.0	-	-
	Primary PCI Within 90 Minutes of Hospital Arrival	94.0%	96.0%	**-2.0%**	5.1	5.9	**-0.7**
	Discharge Instructions	93.2%	94.0%	**-0.8%**	5.5	5.5	0.0
	Blood Cultures Performed in the Emergency Department Prior to Initial Antibiotic Received	96.9%	97.9%	**-1.0%**	4.5	5.1	**-0.6**
	Initial Antibiotic Selection for CAP in Immunocompetent Patient	95.2%	95.8%	**-0.6%**	4.5	4.6	-0.1
	Prophylactic Antibiotic Received Within One Hour Prior to Surgical Incision	97.8%	98.6%	**-0.8%**	5.4	5.7	**-0.3**
	Prophylactic Antibiotic Selection for Surgical Patients	98.2%	98.8%	**-0.6%**	5.4	6.0	**-0.6**
	Prophylactic Antibiotics Discontinued Within 24 Hours After Surgery End Time	96.9%	97.7%	**-0.8%**	5.0	5.2	-0.2
	Cardiac Surgery Patients with Controlled 6AM Postoperative Serum Glucose	96.3%	96.9%	**-0.6%**	4.9	5.3	-0.4
	Postoperative Urinary Catheter Removal on Post-Operative Day 1 or 2	95.6%	97.1%	**-1.5%**	6.4	6.8	**-0.4**
	Surgery Patients on a Beta Blocker Prior to Arrival That Received a Beta Blocker in Perioperative Period	95.3%	97.4%	**-2.1%**	5.0	5.8	**-0.8**
	Surgery Patients Who Received Appropriate Venous Thromboembolism Prophylaxis Within 24 Hours Prior to Surgery to 24 Hours After Surgery	96.5%	97.8%	**-1.3%**	5.4	5.8	**-0.4**

Bolded values are significant at p<0.05. HVBP scores reported by CMS. DSH=disproportionate share hospital; PCI=percutaneous coronary intervention.

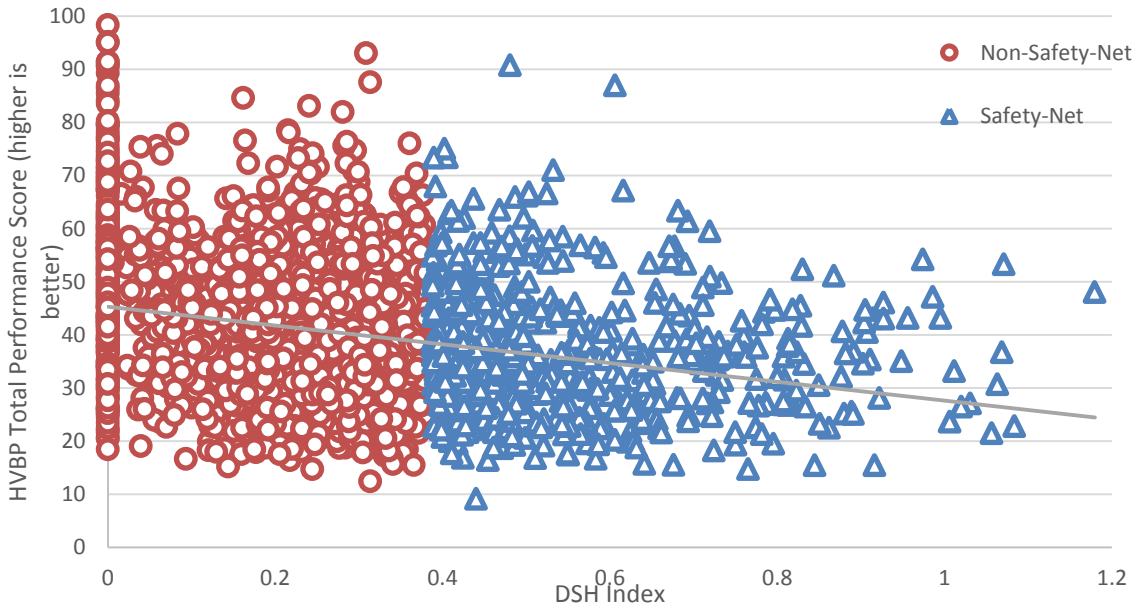
FY 2016 domain weights reflect the greater weighting of efficiency (from 20% to 25%) and outcomes measures including patient safety (from 30% to 40%). This greater emphasis on efficiency and outcomes measures in the program will carry over to future program years from FY 2017 onwards. Table 7.9 shows performance by hospital safety-net status (top 20% DSH) for each domain, demonstrating that safety-net hospitals had worse performance than non-safety-net hospitals on patient experience, processes of care, and total score in FY 2015 and for patient experience, processes, efficiency, and total score in FY 2016. For both years, the largest differences were in the patient experience domain.

Table 7.9. FY15 and FY16 HVBP Domain and Total Performance Scores, by Hospital Safety-Net Status

Domain	FY15				FY16			
	Weight	*Safety-Net*	*Rest*	*Diff*	*Weight*	*Safety-Net*	*Rest*	*Diff*
Patient Experience	30%	10.4	14.4	**-4.0**	25%	7.2	10.7	**-3.5**
Outcomes	30%	13.6	13.8	-0.2	40%	19.7	20.2	-0.5
Efficiency	20%	4.4	4.6	-0.2	25%	4.8	5.5	**-0.7**
Process of Care	20%	10.9	11.9	**-0.9**	10%	5.7	6.3	**-0.7**
Total Score	100%	37.5	42.6	**-5.1**	100%	36.6	41.2	**-4.6**
Bolded values are significant at p<0.001. HVBP scores reported by CMS.								

The total performance scores by safety-net status are also displayed in Figure 7.4, demonstrating that while there are high-performing and low-performing hospitals among both safety-net (blue triangles) and non-safety-net (red circles) hospitals, the relationship between DSH index and performance persists across the distribution of DSH Index:

Figure 7.4. Scatterplot of DSH Index vs. FY2016 HVBP Total Performance Score



When these scores were translated into payment adjustment factors, the difference in average payment adjustment factor between safety-net and other hospitals was small but statistically significant (Table 7.10). Non-safety-net hospitals received a bonus, on average, worth 0.2-0.3% of base DRG payments, while safety-net hospitals on average remained neutral.

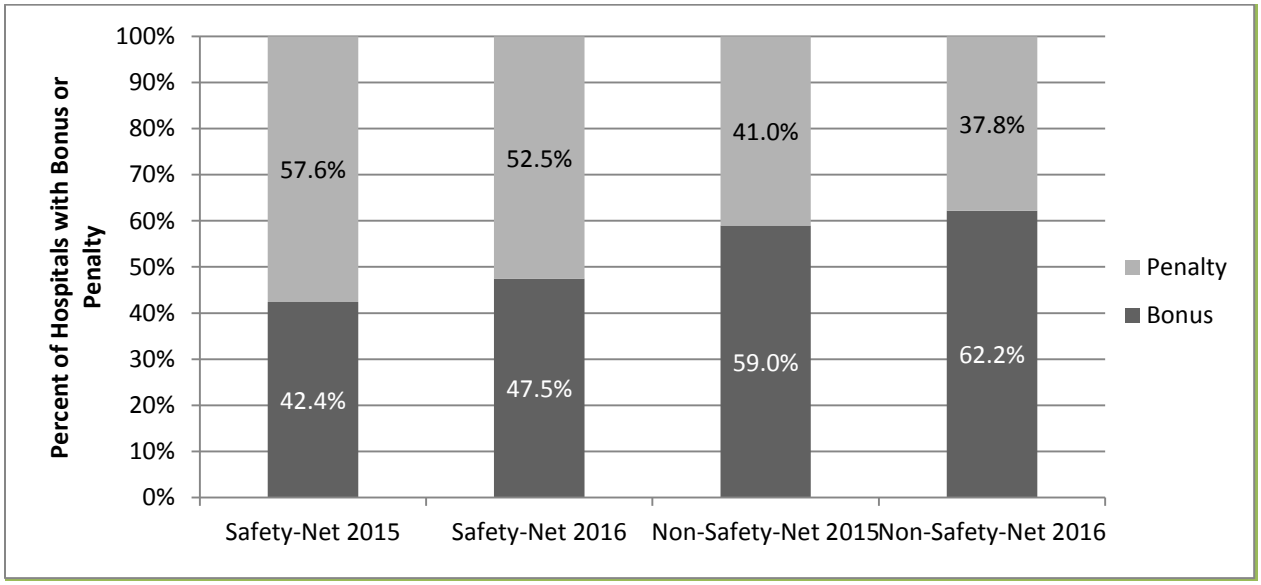
Table 7.10. FY15 and FY16 HVBP Payment Impacts: Average Value-Based Incentive Payment Adjustment Factor, by Hospital Safety-Net Status (top 20% DSH)

Program Year	Hospitals (n)	Average Value-Based Incentive Payment Adjustment Factor			
	All	*All*	*Safety-Net*	*Rest*	*Difference*
FY 2015	3051	1.001	1.000	1.002	**0.002**
FY 2016	2987	1.002	1.000	1.003	**0.002**

Value-based incentive payment adjustment factors greater than one indicate bonuses; adjustment factors less than one indicate penalties. A payment adjustment factor of 1.01 would be equivalent to a 1% bonus; a payment adjustment factor of 1.001 would be equivalent to a 0.1% bonus. A payment adjustment factor of 0.99 would be equivalent to a 1% penalty. Bolded values are significant at p<0.001.

Another parameter examined was the proportion of each type of hospital receiving a positive (bonus) versus negative (penalty) value-based incentive payment adjustment compared with other types of hospitals. Here the differences were larger (Figure 7.5). Safety-net hospitals were more likely to be penalized in both years of the HVBP program; in FY 2015 nearly 58% of safety-net hospitals received a negative payment adjustment compared with 41% of other hospitals. Patterns were similar in FY 2016.

Figure 7.5. FY15 and FY16 HVBP Payment Impacts: Proportion of Hospitals with Bonus or Penalty (positive or negative value-based incentive payment adjustment factor), by Hospital Safety-Net Status



VII. Policy Options

A. Introduction

Policy options are simulated, and weighed against the policy criteria outlined in Chapter 1 to ultimately inform strategies and considerations for accounting for social risk. Those policy criteria are reiterated in Table 7.11:

Table 7.11. Policy Criteria

Policy Criteria
1. Encourages reduction in disparities in quality and outcomes
2. Protects beneficiaries' access to care by reducing disincentives to caring for high-risk populations
3. Protects providers from unfair financial stress
4. Adjusts only for the difference in performance related directly to the social risk factor, and only for what is beyond provider control
5. Promotes transparency to facilitate consumer choice
6. Supports delivery system reform and Alternative Payment Models

How policymakers weigh these criteria could differ. For example, some may feel that protecting providers from unfair financial stress is the most important criterion, and may be willing to adjust for factors under providers' control or negatively impact transparency to achieve that goal. On the other hand, some may feel that transparency is the most important criterion, and argue that avoiding financial stress for providers or promoting delivery system reform are less important policy considerations.

The policy simulations in this chapter only address the efficiency domain. The patient experience and processes of care measures are not addressed via simulation because, as elaborated earlier, the patient experience measures are already adjusted for social risk factors, and processes of care are largely measures where accounting for social risk is inappropriate or unnecessary. Improving safety-net hospitals' performance on patient experience and processes of care will require strategies to improve care delivery through technical assistance; these interventions are discussed after the policy simulations.

The patient safety domain is not addressed here because it is covered in depth in the Hospital-Acquired Conditions Reduction chapter, which precedes this one. Because the safety measures are in two programs, safety-net hospitals' poor performance counts against them to a greater degree than poor performance on many other types of measures. Therefore, ongoing evaluation of these measures, and their impact on the safety net, is of particular importance. Further, the points made about the patient safety measures in the HACRP chapter remain germane here: safety-net hospitals may be disadvantaged by safety measures that do not account for medical risk, and therefore the current measures that are not adjusted for risk should be a priority for further evaluation. Finally, in simulations in which examined the impact of removing the safety measures from HVBP was examined, there was a moderate reduction in the difference in the likelihood of receiving a penalty between safety-net and non-safety-net hospitals. However, such an approach is not currently recommended given the high priority placed on patient safety.

Some have argued that social risk should be addressed in HVBP by adjusting the program's "bottom line": one policy option to that end would be to account for social risk at the total performance score

level rather than by domain or measure. For example, some may argue that stratification at the total performance score level could be a viable approach to more fairly determine the HVBP payment adjustment. However, this would explicitly establish a lower standard for safety-net hospitals that is driven primarily by differences in patient experiences and quality of care – two elements that are arguably most directly within providers' control and accountability. Therefore, accounting for social risk by stratifying overall performance scores was not in keeping with the policy goal of adjusting only for the difference in performance related directly to the social risk factor, and only for what is beyond provider control, and was not modeled here.

Instead, the policy option modeled focuses on direct adjustment within the efficiency domain to address social risk, which could be done for reporting and payment purposes, or for payment purposes alone. This is outlined in Table 7.12:

Table 7.12. Summary of Policy Options

Option Title	Specifics of Option	Pros	Cons
1. Status Quo	No changes to the current program	• Promotes transparency to facilitate consumer choice	• Does not address issue of social risk
2. Adjustment	Adjust MSPB measure for dual enrollment	• Recognizes that achieving high quality care may require more resources for dually-enrolled beneficiaries • Consistent with other cost measures that adjust for dual enrollment • May protect beneficiaries' access to care by reducing disincentives to caring for high-risk populations • May protect providers from unfair financial stress	• May discourage reduction in disparities in resource use • Reduces transparency to facilitate consumer choice • May adjust for factors within provider control • Alterations to the current measure may require re-endorsement

B. Policy Option Simulation Results

1. Status Quo

The first policy option was the status quo. For the measures in the patient experience and processes of care domains, the status quo seems to be working relatively well to account for differences in beneficiaries' social risk on patient experience and reflect actual differences in quality and thus no changes are recommended in those areas. However, based on analyses of the measure in the efficiency domain, program changes could be considered, and are simulated below.

2. Risk Adjustment: Adjust MSPB for Dual Enrollment

In the Efficiency domain, higher spending on the current MSPB measure was associated with beneficiaries' dual enrollment status, and was primarily driven by higher post-acute care spending for institutional post-acute care. Such post-acute care could be appropriate and necessary for these

beneficiaries, since prior literature demonstrates that dually-enrolled beneficiaries tend to have poorer functional status and are more likely to lack social support,[30,34,36] factors which are beyond providers' control.

The benefit of adjusting for dual enrollment status is thus to avoid inappropriately penalizing providers for selecting an appropriately intense post-acute location when discharging patients from the hospital. The potential drawback is the risk of over-adjusting if some of this more intense post-acute use is inappropriate. This option also fails to appropriately reward providers who have beneficiaries with poor functional status or low social support that are NOT dually-enrolled; if more precise measures of functional status and social support were available, they might be a more optimal adjuster than dual enrollment status itself. As mentioned above, further work in this area will continue in Study B.

There is precedent for adjusting resource use measures for dual enrollment status; the spending measures used in the Physician Value-based payment modifier Program, for example, adjust for dual enrollment status, and the Medicare Advantage program also includes dual enrollment status in its risk adjustment payment methodology. Adjusting MSPB for dual enrollment status would be essentially budget-neutral since it would not change the part of the program's calculation that ensures budget neutrality. This policy option might require re-specification of the measure and re-endorsement by NQF if substantive changes are made.

This policy option was simulated by adding dual enrollment status directly to the risk-adjustment model for the MSPB measure, and then re-calculating improvement and achievement scores and reassigning a domain score for the Efficiency domain. In FY 2016, there was a difference in performance on Efficiency domain scores by safety-net status, with safety-net hospitals scoring 4.8 compared to non-safety-net hospitals' 5.5 (Table 7.13). However, after adjusting the MSPB measure for dual enrollment status, the score difference was reduced to 0.3 points and was no longer statistically significant. The gap between safety-net and non-safety-net hospitals in the proportion of hospitals penalized and the average payment adjustment factor were both reduced.

Table 7.13. Policy Option: Adjusting MSPB for Dual enrollment status

	Current Policy (FY 2016)			**Adjusting MSPB for dual enrollment status**		
	Safety-Net	***Non-Safety-Net***	***Difference***	***Safety-Net***	***Non-Safety-Net***	***Difference***
MSPB ratio	0.998	0.983	**0.015**	0.990	0.984	0.006
Efficiency domain score (weighted)	4.8	5.5	**-0.7**	5.1	5.4	-0.3
% Penalized	53.4%	36.5%	**17.0%**	52.6%	36.8%	**15.8%**
Average Value-Based Incentive Payment Adjustment Factor	1.000	1.003	**-0.003**	1.001	1.003	**-0.002**
Payment adjustment factors greater than one indicate bonuses; adjustment factors less than one indicate penalties. Safety-net hospitals are those in the top 20% of DSH Index. Bolded values are significant at p<0.001.						

Adjustment for dual enrollment status thus equalized measure performance on the MSPB measure for safety-net and non-safety-net hospitals. However, it only reduced the difference in proportion of safety-net hospitals penalized by about 1%, because the efficiency domain only represents one quarter of the total HVBP score.

Many other cost measures are in existence or under development, and though none are currently part of HVBP, a number have been adopted and proposed for the Hospital Inpatient Quality Reporting program (see 81 Fed. Reg. 56761). It will be important to assess if those measures also show higher spending for beneficiaries with social risk factors, and if those measures adjust for dual enrollment status, other measures of social risk and if the clinical risk-adjustment is adequate. Condition-specific cost measures for AMI, HF, and pneumonia are also undergoing analyses as part of the National Quality Forum's trial of including sociodemographic status in measure risk-adjustment.[37] The analyses presented in this chapter did not examine these measures as they are not currently in the HVBP program. However, CMS may wish to examine if there may be higher spending for dually-enrolled beneficiaries in these measures prior to adoption in the HVBP program, and to understand if this may be driven partly by institutional post-acute care spending, which, like the MSPB measure, could be due to beneficiaries' functional status and lack of social support. Furthermore, if these measures are eventually incorporated into the Efficiency domain of the HVBP program, it will be important to see how this may change the program impacts on safety-net hospitals.

C. Summary of Policy Options

In summary, under the current HVBP program based on FY 2016, safety-net hospitals have on average a 5 point lower Total Performance Score than other hospitals, resulting in a higher likelihood of receiving a penalty rather than a bonus and a slightly higher penalty on average. Adjusting MSPB for dual enrollment status was associated with a smaller gap between safety-net and non-safety-net hospitals in the proportion penalized, and in the average penalty levied (Table 7.14).

Table 7.14. Summary of Policy Options, differences between safety-net (top 20% DSH) versus non-safety-net hospitals

Policy Option	Difference in Average TPS	Difference in Percent Penalized	Difference in Average Payment Adjustment Factor	Average payment adjustment amount, SNH, $	Average payment adjustment amount, non-SNH, $	Difference in average payment amount, $
Status Quo (FY 2016)	-5.1	17.0%	-0.0027	-$45,908	$11,351	-$57,259
Adjust MSPB for Dual status*	-4.6	15.8%	-0.0025	-$42,454	$10,497	-$52,951
	TPS=total performance score. Policy options are modeled using FY 2016 program weights and measures. *ASPE calculated the MSPB measure from claims-data to incorporate dual enrollment status into the measure risk-adjustment.					

VIII. Key Findings, Strategies, and Considerations

A. Key Findings

Underlying Relationships

- Dually-enrolled beneficiaries had higher spending per care episode, as modeled using the Medicare Spending per Beneficiary parameters; differences were primarily driven by post-acute spending, both in terms of the frequency of use of more expensive settings and the spending within each setting.
- Social risk factors were generally protective for 30-day mortality measures, with the exception of disability and rural status, which were associated with higher mortality at both the beneficiary and hospital level.

Program Impacts

- Safety-net hospitals' worse performance on the total HVBP performance score was driven primarily by poor performance on patient experience measures. These hospitals also performed slightly worse than non-safety-net hospitals on process of care measures and efficiency, and on the patient safety components of the outcome domain. However, safety-net hospitals performed equivalently to other hospitals on the mortality components of the outcome domain.
- Safety-net hospitals were more likely to receive penalties and less likely to receive bonuses under HVBP.

Policy Simulations

- Adjusting the MSPB efficiency measure for dual enrollment status was associated with slight improvements in performance for safety-net providers.

B. Strategies and Considerations

Strategies and considerations are outlined below. They are, as in all program chapters in this report, organized into three broad strategies that best meet the policy criteria outlined in Chapter 1. 1) Measure and report quality for beneficiaries with social risk factors; 2) Set high, fair standards for all beneficiaries; and 3) Reward and Support Better Outcomes for Beneficiaries with Social Risk Factors.

STRATEGY 1: Measure and Report Quality for Beneficiaries with Social Risk Factors

Measurement and reporting are foundational for quality improvement in health care.

CONSIDERATION 1: Consider enhancing data collection and developing statistical techniques to allow measurement and reporting of performance for beneficiaries with social risk factors on key hospital quality and resource use measures.
The ability to measure and track quality, outcomes, and costs for beneficiaries with social risk factors over time is crucial as providers seek to reduce disparities and improve care for these groups to the greatest degree possible.

However, currently, there are areas in which data limitations make calculating and reporting performance for at-risk subgroups difficult. For measures currently collected on only a sample of patients, such as those in the patient experience and process of care domains, a strategy should be developed to capture data that would allow calculation and reporting of performance by important subgroups. This strategy would allow the Department and hospitals, as well as consumers, to better-understand who performs well for dually-enrolled beneficiaries and where there are particular areas for targeted improvement. This is consistent with the policy goal of encouraging reductions in disparities in quality and outcomes, and also promotes transparency to facilitate consumer choice.

Alternate sampling methods may be necessary for stratified reporting for measures in which sample size is currently too small. Such methods could include stratified samples rolled over multiple measurement periods, or allowing survey vendors to collect additional demographic data for the HCAHPS.

When adequate data are available, key patient safety and infection measures stratified by social risk should be developed and considered for hospital preview reports and/or public reporting in places such as Hospital Compare, so that hospitals, health systems, policymakers, and consumers can see and address important disparities in care. CMS' Office of Minority Health has started to develop and pilot approaches to reporting health plan quality data by race and ethnicity and other patient subgroups through its website (see **https://www.cms.gov/About-CMS/Agency-Information/OMH/OMH-DPAG-StatisticsAndData.html**).

While not all measures may lend themselves to reporting by patient social risk subgroups, a key subset of measures should be pursued for subgroup reporting at the hospital level.

CONSIDERATION 2: Consider developing and introducing a health equity measure or domain into the HVBP program to measure disparities and incent a focus on reducing them.

Financial incentives help providers prioritize areas for particular focus, and specific measures targeting equity within existing value-based purchasing programs can therefore send a powerful signal. This may be achieved by adding a health equity measure or domain to existing programs.

A new Health Equity measure or domain should be added to the HVBP program when feasible. The report on best practices for socially at risk beneficiaries from the National Academies of Medicine recognized the prioritization of equity as a key strategy for health care organizations to deliver high-quality care to beneficiaries with social risk factors.[39] To highlight the importance of health equity and to focus hospitals' attention on reducing disparities in care for patients, creating a health equity domain is recommended. This would enhance incentives to deliver high-value care to all patients, including beneficiaries with social risk factors. This approach would be particularly consistent with the policy criterion of encouraging reductions in disparities. Such a domain could allow hospitals to gain extra

points for closing the gap in performance on quality, patient experience, and outcomes. If socially at-risk patients require more resources to achieve the same outcomes, the bonus points achieved could help recognize and reward the additional efforts hospitals undertake to achieve those outcomes.

A health equity domain in HVBP could include performance on measures of disparity reduction (within a hospital, or on achievement compared to a national benchmark for the subgroup of interest), or include structural measures to give credit to hospitals who have undertaken quality improvement efforts targeting socially at-risk patients, including systems practices that address the needs of socially at-risk patients. One case study is HealthPartners, a large health system in the Midwest which has implemented a Disparities Scorecard and offers payment incentives for meeting disparities reduction goals.[39] Others have noted collecting community-level data on social risk factors can help hospitals and other providers better understand their at-risk population under a population health approach and help to redesign care and establish community partners to address their population's social needs. This may motivate providers to address social factors that drive health outcomes.[40,41]

A health equity domain could be scored either as part of the program's current Total Performance Score (TPS), or be applied as an additional adjustment to the TPS to incentivize reductions in disparities. A payment adjustment for health equity would clearly identify hospitals that perform well on this measure and increase transparency to consumers.

While specific approaches or measures were not evaluated, this concept was put out for public comment by CMS in the context of the Hospital Inpatient Quality Reporting Program for future years, and has been proposed as one potential measure type in the clinical practice improvement area for the Merit-based Incentive Payment System (MIPS) program. Public input on how to measure disparities and give credit for efforts to reduce disparities, especially from safety-net hospitals and community partners, would help ensure that the HVBP program appropriately rewards equity.

CONSIDERATION 3: Consider prospectively monitoring for potential unintended consequences. In particular, the cumulative penalties across the three hospital programs for providers that serve beneficiaries with social risk factors should be tracked.

Prospectively monitoring the financial impact of Medicare payment programs on providers disproportionately serving beneficiaries with social risk factors is critical as the programs continue to change. This is particularly important since the measures, domains and weighting in the HVBP program have changed each year since the program started.

While the HVBP program offers penalties and incentives based on performance, the bonuses from the HVBP program alone cannot offset the penalties from the three hospital programs overall (HRRP, HVBP, and HACRP). For safety-net hospitals in particular, although penalties from a single program may be small, the additive penalties across all three programs may be significantly larger. This may be

particularly important given the presence of safety measures in both the HACRP and HVBP. Safety-net hospitals and other hospitals who disproportionately serve beneficiaries with social risk factors may be more likely to be negatively impacted across the three hospital programs. Thus, monitoring should include both unintended consequences of the HVBP as well as cumulative financial impact across the hospital programs, with a focus on hospitals who disproportionately serve socially at-risk beneficiaries.

STRATEGY 2: Set High, Fair Standards for All Beneficiaries

Given the overarching goal of improving care for all beneficiaries, providers should be held to high, fair standards regardless of the beneficiaries they serve.

CONSIDERATION 1: The measures used in the current HVBP program should continue to be examined to determine if adjustment for social risk factors is appropriate.

The measures in the HVBP program are a diverse set – they include process measures, which are not adjusted for medical or social risk; outcome measures, which are adjusted for medical but not social risk; safety measures, some of which are adjusted for medical risk and some of which are not, and none of which are adjusted for social risk; patient experience measures, which are adjusted for social risk; and a resource use measure, which is adjusted for medical but not social risk. This program in particular points out the importance of considering each measure independently to determine whether or not adjustment is appropriate, and if so, what kind.

Perhaps the measure that warrants the most discussion and ongoing research in the current HVBP portfolio is the MSPB. There is no general consensus as to whether resource use measures should be adjusted for social risk – in the current Medicare program, while the MSPB measure does not account for social risk in its current form, other resource measures do. For example, the per-capita costs of care measures contained in the Physician VM program (Chapter 10) are adjusted for dual status, as are cost growth calculations in the Medicare Shared Savings Program (Chapter 9).

Adjustment of resource use measures may be appropriate where relationships exist with social risk that may be reflective of higher care needs because higher resource use (measured as costs) may reflect higher need rather than lower quality. For example, dually-enrolled beneficiaries may have greater needs, including social support, functional or cognitive limitations, or higher severity of disease, and require greater resources to achieve the same outcomes as other beneficiaries. Institutional post-acute care settings, which are more costly, may nonetheless be most appropriate for recuperating beneficiaries with unstable housing who cannot safely be discharged home, or for beneficiaries with disabilities who need specialized equipment during their post-acute recovery period. Prior evidence suggests that beneficiaries with social risk factors are at lower risk for over-use of care and at higher risk of unmet medical need, so resource use measures that do not adequately account for these factors may carry a risk of unintended consequences.

On the other hand, some of the higher costs seen in beneficiaries with social risk factors may be related

to lower quality care, such as inappropriate overuse of high-cost treatments. In these cases, risk adjustment might mask disparities. However, prior evidence has shown that overuse is more frequent among socially low-risk populations, and that beneficiaries with social risk factors are actually more likely to not receive certain treatments (such as stents in the setting of a heart attack). Therefore, these beneficiaries may have unmet care needs artificially lowering their costs, and the overuse component may not be a major driver of higher spending in socially at-risk beneficiaries.

Some of the higher costs seen in beneficiaries with social risk factors may also be related to lower quality care as reflected in preventable admissions or readmissions. This is one important limitation of adjustment that should be kept in mind; adjusting away markers of poor quality care would be counter to the goals of this and other Medicare payment programs. Incenting the reduction of such clinical events via quality metrics is therefore an important counterpart when resource use measures are adjusted for social risk.

One potential means for updating the MSPB measure, if consensus were to be reached that adjustment were the preferred approach, would be by updating its clinical risk-adjustment with the updated 2017 HCC risk-adjustment model used for adjusting Medicare Advantage payments. In 2016, the MA program performed analyses of fee-for-service spending and determined that the prior version of the model under-predicted costs for full-benefit dually-enrolled beneficiaries by 8% but over-predicted costs in partial-benefit dually-enrolled beneficiaries. They concluded that the model could be improved by breaking community-dwelling beneficiaries into six mutually exclusive segments to predict costs: under-65 fully dual-enrolled, under-65 partially dual-enrolled, under-65 non dually-enrolled beneficiaries, and these three same dual enrollment categories in the 65 and over population. Currently, the MSPB measure uses a variant of the HCC model that includes disability but not dual enrollment status; the measure could be tested to determine if simply using the updated HCC model improves estimation of costs for dually-enrolled beneficiaries.

This report only examined current measures in the program and did not evaluate all potential cost measures that may be included in the program in the future. Other cost measures considered for inclusion in the HVBP program's Efficiency domain should be similarly evaluated to determine whether clinical risk-adjustment is adequate and whether beneficiaries with social risk factors have higher costs, potentially due to appropriate use of post-acute care. While the choice of post-acute care setting is under the hospital's control, beneficiaries' functional and social needs determine safe and appropriate discharge destinations. Resource use measures should, to the extent possible, reflect appropriateness of care, not just costs.

It is also important to note that this consideration is entirely independent of DSH payments. DSH payments are intended to address the higher costs of providing care to beneficiaries with social risk factors, and are not value-based payments intended to specifically reward hospitals that perform well for this population. DSH payments are an add-on dollar amount for each unit of service rendered, whereas the MSPB compares units rendered at one hospital versus another, irrespective of any price

differences (whether geographic or related to an add-on like DSH or GME payments).

In terms of the other measures examined in this chapter, further research is also needed. The mortality measures were one of the few places in this report in which beneficiaries with social risk factors actually did better than non-at-risk beneficiaries. However, the same considerations still hold: adjusting for social risk factors in the measures themselves could make it more difficult to see and address disparities, or negatively impact transparency for consumers. On the other hand, to the degree differences in mortality are related to factors beyond providers' control, some may favor adjustment.

Issues around whether or not to adjust patient safety measures were discussed at more length in the previous chapter (Chapter 6) focused on the Hospital-Acquired Conditions Reduction Program; please see that chapter for the full discussion of these measures. Safety measures included in HVBP should be studied to determine how they could be best and most equitably used to compare performance between hospitals; ultimately, having patient-level data that allows comparisons to be made that account for differences in medical risk profile, where appropriate, could potentially improve both the accuracy of hospital performance assessment and buy-in from the hospital community.

CONSIDERATION 2: Program measures should be studied to determine whether differences in health status might underlie the observed relationships between social risk and performance, and whether better adjustment for health status might improve the ability to differentiate true differences in performance between providers.

The finding that dually-enrolled beneficiaries have higher episode costs on the MSPB measure than non-dually enrolled beneficiaries likely represents a mix of underlying medical and social factors. For example, dual enrollees have previously been shown to be more medically complex, which may impact costs, but also may be more likely to have functional and cognitive limitations and to lack family or community support at home, or have unstable living arrangements which may impact care planning.

Therefore, ongoing study should identify information about beneficiaries' functional status and social support at hospital discharge that may better capture beneficiary needs for post-acute care. These data are not currently broadly available, but may be critical to improving risk-adjustment models. If research is able to identify additional measures of functioning and social support, those could potentially eventually be used in lieu of adjusting for dual enrollment or disability status.

STRATEGY 3: Reward and Support Better Outcomes for Beneficiaries with Social Risk Factors

One of the important findings in this chapter was the wide distribution of performance among providers disproportionately serving beneficiaries with social risk factors. This suggests that achieving better outcomes for these groups is feasible. However, in many cases it may require more effort on the part of

providers, or more resources and more support, than achieving the same outcomes in a lower-risk population.

CONSIDERATION 1: Consider providing additional financial incentives for achievement and/or improvement in quality and outcomes in beneficiaries with social risk factors.

Achievement and/or improvement in high-risk populations should be rewarded, and this could be done by adding targeted payment adjustments to existing value-based purchasing programs such as HVBP. Such opportunities would also help counteract any disincentives under value-based or alternative payment models to caring for high-risk populations.

Hospitals that demonstrate good outcomes in beneficiaries with social risk factors could receive a higher TPS under the current linear exchange function, or be eligible for an additional incentive (i.e. funded from a separate pool of funds, or using a non-linear exchange function in the HVBP program).

While the specific methods such incentives would need to be developed and modeled, there are examples of how one could be constructed. The current Physician VM program, for example, provides an additional payment adjustment for physician practices that serve a high proportion of medically complex beneficiaries if they meet the high performance threshold– practices with highly complex beneficiaries can thus receive additional financial incentives for good performance funded by the withheld payments in a budget neutral manner. Such an incentive could be mirrored, or perhaps altered to target socially at-risk beneficiaries regardless of their care location rather than just hospitals that serve these beneficiaries, for hospitals that achieve good outcomes among at-risk beneficiaries with social risk factors.

Note that this consideration is independent of DSH payments. DSH payments are intended to address higher costs of providing care to beneficiaries with social risk factors, rather than a value-based purchasing program intended to specifically reward hospitals that perform well for this population.

CONSIDERATION 2: Consider using existing or new quality improvement programs to provide targeted technical assistance to hospitals that disproportionately serve beneficiaries with social risk factors.

Improving care delivery by hospitals serving at-risk populations would serve both to reduce disproportionate penalty burdens on these hospitals, and more importantly, to improve care for the most socially at-risk Medicare beneficiaries.

One of the key findings in this work was that the differences between safety net and non-safety-net hospitals on overall VBP performance was largely driven by differences in patient experience. The Hospital CAHPS patient experience measures already adjust for many patient social risk factors, such as educational level, language, and self-reported health status, as well as other factors such as survey administration mode, so these remaining differences likely reflect poorer patient experiences in safety-net hospitals. This is a critical area to address to promote reductions in disparities and to ensure that all

Medicare beneficiaries have access to patient-centered, high-quality care.

New and existing hospital resources should be employed to help safety-net hospitals improve poor patient experience of care. Such resources could include Quality Improvement Organizations - Quality Improvement Networks (QIOs-QINs). This would support overall goals to improve quality and outcomes, and reduce disparities in care. Providing support for quality through targeted technical assistance builds on and supports the second and third strategies – reporting and understanding where potential disparities exist, and subsequently, rewarding hospitals for addressing those disparities. In concert, these recommended strategies support the need to build the infrastructure to address disparities in care for socially at-risk patients and the providers who serve them.

Prior reports have suggested that there are disparities-reduction interventions that could help improve patient experience including training in cultural competency, using multi-disciplinary teams, engaging patients and families, providing interactive education and targeting multiple leverage points along patients' care pathway.[42,43] However, more research is needed to identify best practices and strategies, including those that may be particular to specific social risk groups.[44] Peer-based hospital collaboratives could identify and share best practices in caring for beneficiaries with social risk factors, engaging in research with other federal and local partners to build the expertise needed to help safety-net hospitals best care for their socially at risk patients.

More broadly, CMS could also work with AHRQ on the Healthcare Quality and Disparities Reports to take the existing national and state-level reports and develop reports at the local hospital service area (HSA) to encourage collaboration between providers to address disparities with the support of local collaboratives and quality improvement organizations.

CONSIDERATION 3: Consider developing demonstrations or models focusing on care innovations that may help achieve better outcomes for beneficiaries with social risk factors who are hospitalized.

Quality improvement efforts to date have focused on hospital processes, but beneficiary-directed programs could also help to achieve better post-discharge outcomes, such as improved 30-day mortality or more efficient use of post-acute care. Consider demonstration projects aimed at dually-enrolled individuals who may have more care transition needs to improve post-hospital outcomes and health care utilization. This could be modeled on the successes found in Medicare Advantage plans that have focused on integrating benefits and supports across Medicare and Medicaid to support beneficiaries with social risk factors, or CMMI's Accountable Health Communities.[2,31]

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SECTION 3: Medicare Advantage, the Medicare Shared Savings Program, and the Physician Value-Based Payment Modifier

Currently, there are three value-based or alternative payment models that primarily (though not exclusively) assess quality, outcomes, and costs in the ambulatory setting: the Medicare Advantage Star Rating program, which started in 2008; the Medicare Shared Savings Program (Medicare Shared Savings Program), which started in 2012; and the Physician Value-Based Payment Modifier (VM) program, which started in 2015.

These programs have a number of similarities. In terms of quality measurement, the programs use similar strategies. They each attempt to measure a broad range of quality in the ambulatory setting by including measures that span clinical conditions. They share many metrics, including process measures like body mass index (BMI) assessment, intermediate outcome measures like blood sugar control in diabetics, and outcome measures like hospital readmissions. The manner in which quality is assessed is slightly different between programs: the MA program uses a combination of cluster analysis, relative distribution techniques, and fixed cut points to assign "stars" to performance on different measures, while the Medicare Shared Savings Program compares ACO quality performance on certain measures to benchmarks derived from FFS data available prior to the performance year, and the VM program judges practices against other practices' achievement in the current year. The MA program includes an improvement measure, on which contracts earn points by improving on the other program measures; the Medicare Shared Savings Program added such an opportunity for the 2015 performance year, and the Physician VM program currently does not include any reward for improvement.

On the resource use side, the programs are more different. The MA program does not include resource use metrics in its Star Rating program. The Medicare Shared Savings Program assesses each ACO's spending against a benchmark based on its own costs, thus inherently rewarding improvement in spending rather than rewarding ACOs for achieving specific cost targets. The Physician VM program, on the other hand, assesses practices' performance on total costs of care for attributed beneficiaries compared to other program participants, therefore rewarding achievement rather than improvement.

Germane to the current exploration of social risk, each program currently takes social risk into account in a different manner. In the MA program, CAHPS measures are adjusted for education level as well as

dual enrollment or low-income subsidy status, and two additional measures (Improving or Maintaining Physical Health and Improving or Maintaining Mental Health) are adjusted for education level and income. While there are no resource use measures per se in the Star Rating program, risk adjustment payments made from CMS to the MA contracts are adjusted for full and partial dual enrollment, to recognize that resource use is higher in these individuals than in non-dually-enrolled beneficiaries. In the Medicare Shared Savings Program, CAHPS measures are similarly adjusted for social risk factors. Additionally, Medicare Shared Savings Program costs and cost growth are calculated separately for dually-enrolled beneficiaries, and the fact that costs are measured against an ACO's own benchmark also controls for differences between ACOs' patient populations in social and medical risk. In the Physician VM program, dual enrollment is included as one element of the Hierarchical Condition Categories (HCC) risk score; this score, as well as the score squared, is included in the risk-adjustment model for total per capita costs of care. Similarities and differences are summarized in Table S3.1; these have implications for the impact of each program on providers that serve beneficiaries with social risk factors, which will be explored in each chapter.

Table S3.1: Comparison of Quality and Cost Methodology in MA, the Medicare Shared Savings Program, and Physician VM

	Quality Measures	Quality Benchmarking	Resource Use Measures	Resource Use Benchmarking	Rewards Improvement?	Accounts for Social Risk?
MA Quality Star Rating system	Processes, outcomes, patient experience	Cluster analysis, relative distribution techniques, and fixed cut points on current year performance to assign stars	None	Payment adjusted for medical risk and full or partial dual enrollment	Yes, via an improvement measure	CAHPS measures, physical and mental functioning measures, dual enrollment in payment
Medicare Shared Savings Program	Processes, outcomes, patient experience	Benchmarks for performance measures are based on FFS data from prior years, as available	Aggregate spending compared to growth target	Targets benchmarked against historical spending plus cost growth	Yes, via bonus points rewarding improvement as well as cost benchmarking	CAHPS measures, dual enrollment in cost benchmarking
Physician Value-Based Payment Modifier	Processes, outcomes, patient experience (future)	Z-scoring of current year performance to assign quality scores	Total per capita costs of care, condition-specific per capita costs of care, MSPB	Z-scoring of current year costs to assign cost scores	No	CAHPS measures, dual enrollment included as part of risk score for risk-adjustment of some cost measures

CHAPTER 8: Medicare Advantage

In This Chapter:

- ***Is there a relationship between beneficiary social risk and performance on the metrics that comprise the Medicare Advantage Quality Star Rating program?***
- ***Is there a relationship between contract social risk profile and performance on the metrics that comprise the program?***
- ***Are contracts that serve a high proportion of beneficiaries with social risk factors less likely to receive bonuses under this program?***
- ***What impact would policy options, including adjustment and stratification, have on contracts' performance and bonuses?***

This chapter presents findings on the relationship between beneficiary social risk and performance under the Medicare Advantage (MA) Quality Star Rating program, and examines policy options for MA.

Key Findings:

Underlying Relationships

- Dually-enrolled or low-income-subsidy, Black, and rural beneficiaries, beneficiaries living in low-income neighborhoods, and beneficiaries with disabilities experienced worse outcomes compared to other beneficiaries on many to most of the quality metrics included in the MA Quality Star Rating program. These differences were small to moderate in size, and largely driven by patient rather than contract factors. Hispanic beneficiaries had better outcomes on most measures.

Program Impact

- Contracts with a high proportion of beneficiaries with social risk factors generally did worse on overall quality scores, and were much less likely to receive quality bonus payments. However, a small number of contracts serving predominantly dually-enrolled / low-income subsidy-enrolled beneficiaries performed well on the quality measures overall.

Policy simulations

- Adjusting for social risk at the measure level, either directly or using an index, led to small changes in performance scores for contracts overall, though there were small gains in high-dual contracts; changes were small because the differences in performance between dually-enrolled and non-dually-enrolled beneficiaries were small for some measures, and because only the patient-level clinical measures were adjusted, and no adjustments were applied to patient experience measures (because they are already adjusted for social risk) or contract-level measures.
- Upweighting the improvement measure had a limited impact.

- Stratifying contracts by proportion dual led to changes in Star Ratings; using population grouping to stratify within contracts also led to changes in Star Ratings.
- Providing star adjustments for improvement or achievement in beneficiaries with social risk factors, or for equity, led to changes in Star Ratings.

Strategies and Considerations for MA

SUMMARY OF STRATEGIES AND CONSIDERATIONS
STRATEGY 1: Measure and Report Quality for Beneficiaries with Social Risk Factors
CONSIDERATION 1: Consider enhancing data collection and developing statistical techniques to allow measurement and reporting of performance for beneficiaries with social risk factors, or for subgroups of plans (e.g., special needs plans) on key quality measures.
CONSIDERATION 2: Measure developers should develop measures that are meaningful for Medicare beneficiaries with disabilities, where many current measures do not apply.
CONSIDERATION 3: Consider developing and introducing a new measure or domain on Achieving Health Equity into the MA program to assess and reward health plan efforts to reduce health disparities.
CONSIDERATION 4: Prospectively monitor the financial impact of the MA program on providers disproportionately serving beneficiaries with social risk factors.
STRATEGY 2: Set High, Fair Standards for All Beneficiaries
CONSIDERATION 1: A temporary adjustment index by contracts' dual and disability makeup should be used in the short term, as outlined in the 2017 Rate Announcement and Call Letter. The measures used in the current MA program should continue to be examined to determine if adjustment for social risk factors is appropriate.
CONSIDERATION 2: Program measures should be studied to determine whether differences in health status might underlie the observed relationships between social risk and performance, and whether better adjustment for health status might improve the ability to differentiate true differences in performance between providers.
STRATEGY 3: Reward and Support Better Outcomes for Beneficiaries with Social Risk Factors
CONSIDERATION 1: Consider providing targeted star adjustments to reward contracts that achieve high quality or improve significantly for dually-enrolled beneficiaries.
CONSIDERATION 2: Consider using existing or new quality improvement programs to provide targeted technical assistance to contracts serving a high proportion of beneficiaries who are dually-enrolled or who have disabilities.
CONSIDERATION 3: Consider requiring that contracts serving dually-enrolled beneficiaries coordinate benefits between Medicare and Medicaid. Barriers to integration of services between the two payers as well as barriers to spending flexibility for supplemental benefits for dually-enrolled beneficiaries should be minimized where feasible.
CONSIDERATION 4: Consider developing demonstrations or models focusing on care innovations that may help achieve better outcomes for beneficiaries with social risk factors.
CONSIDERATION 5: Consider further research to examine the costs of caring for beneficiaries with social risk factors to determine whether current payments adequately account for differences in care needs.

I. Introduction

A. Background

Medicare Advantage (MA), also known as Medicare Part C, provides Medicare beneficiaries with the option to receive their care through health plans operated by private insurers rather than traditional fee-for-service Medicare. MA represents a large and growing share of the Medicare program, enrolling 30 percent of Medicare beneficiaries and accounting for payments totaling $156 billion in 2014.

Beneficiaries choosing Medicare Advantage may select from numerous plans available in a geographic area, which may vary not only based on issuer but also on cost-sharing, network, or other parameters. For quality evaluation purposes, plans are evaluated at the contract level, which represent a group of plans from a single issuer. Contracts' quality is judged on a comprehensive set of quality measures representing multiple quality domains: staying healthy, managing chronic conditions, member experience, member complaints and changes in performance, and customer service. For those MA contracts that also provide Part D, or prescription drug benefits, performance is also evaluated on a similar set of Part D quality metrics (see Appendix Table 8.1). Performance across Part C and Part D metrics is combined to produce an overall Star Rating.

The resulting stars, which range from values of 1-5, are used for several purposes. They are publicly reported to facilitate beneficiary choice; they are reported to the health plans to facilitate ongoing improvement; and they are used to provide financial bonuses to high-performing contracts. In particular, MA contracts achieving 4 or more stars are eligible for a Quality Bonus Payment. Beneficiaries can also switch to 5-star contracts at any point in the year – not just during open enrollment; conversely, consistently low-performing plans are ineligible for online enrollment.

There is concern that the Star Rating system may disadvantage contracts that serve a high proportion of beneficiaries who are at higher social risk, such people who are poor or disabled, or racial or ethnic minorities. Some argue that health plans face a more difficult task in meeting high performance thresholds for their dually-enrolled beneficiaries or beneficiaries with disabilities due to issues outside their control, such as a higher likelihood of difficulties with adherence to medication or dietary advice, or a lack of transportation or stable housing, that might impact health and health outcomes.

Further, the beneficiaries that face these challenges are unequally distributed between contracts, and contracts that serve a high proportion of beneficiaries with social risk factors may have difficult decisions to make in terms of how and where to invest resources. Contracts with a high proportion of at-risk beneficiaries might need to spend additional resources to achieve good scores on medication adherence – for example, providing visiting nurses to help with medication reconciliation, or reminder phone calls to encourage adherence – but spending resources on medication adherence may leave

fewer resources for that contract to invest in interpreter services for their call center, which is also a quality measure.

Proponents of changing the Star Rating program therefore argue that adjusting program measures for social risk or accounting for social risk in another manner would make the program a fairer and more accurate representation of the true performance of contracts.

On the other hand, some argue that adjusting or accounting for social risk would accept a lower quality of care for beneficiaries with social risk factors, potentially ingraining existing disparities even more deeply. Proponents of the current system argue that the MA program should hold all contracts to a high quality standard, regardless of the beneficiaries they serve, but recognize that achieving that standard may cost more in socially or medically high-risk individuals. This view holds that there is an important difference between saying that achieving high quality with low income beneficiaries is out of the plans' control and saying that it requires more financial resources to achieve high quality. Plans that do well on quality measures while serving large numbers of low income beneficiaries may indeed spend more, but the fact that they can achieve higher quality means the population characteristics do not preclude plans from achieving high quality.

Some also argue that the Star Rating program is not the appropriate place in which to account for social risk, but agree that this type of risk could be accounted for in payment adjustments if demonstrated to be associated with higher medical or administrative costs. Contracts providing care to beneficiaries with social risk factors argue that current payment adjustments fail to account for the higher administrative costs in high-risk populations. Currently, MA payment amounts for dual and beneficiaries with disabilities are based on beneficiaries' spending on medical care – for example, appointments, hospitalizations, and medications – but do not include any allowance for higher administrative costs or community-based services; there are no available quantitative data by which to judge whether, or by how much, these costs are underestimated.

There were two changes announced in the 2017 Rate Announcement and Call Letter that are particularly important to this chapter. First, a new Categorical Adjustment Index was announced, which is discussed at more length in the policy simulation section of this chapter. This Index will provide an adjustment to the Star Ratings system for contracts that serve a high proportion of dual/LIS beneficiaries and/or beneficiaries with disabilities. Second, the risk adjustment of capitation rates paid to MA plans raises other opportunities and incentives for serving certain populations. In 2015, CMS found that the risk adjustment model was under-predicting the medical costs for full-benefit dual eligible beneficiaries by over 9 percent while over-predicting costs for partial-benefit dual and non-dually-enrolled beneficiaries. CMS recently announced changes to its payment policy that would adjust the amounts paid to Medicare Advantage contracts to more accurately reflect the FFS cost experiences for full-benefit dually enrolled beneficiaries, partial-benefit dually enrolled beneficiaries, and non-dually-enrolled beneficiaries.

B. Existing Research on Differences Related to Social Risk in the MA Program

Prior research has demonstrated that dually-enrolled beneficiaries and beneficiaries with disabilities have worse outcomes on many of the quality measures included in the MA program.[1,2] There is also evidence that beneficiaries who are racial and ethnic minorities have worse outcomes for many, though not all, measures.[3-5] For example, Black and Hispanic enrollees are less likely to have adequate blood pressure, cholesterol, and diabetes control.[3] However, minority women are actually more likely than White women to receive breast cancer screening in MA, the opposite pattern from fee-for-service Medicare.[6] Analyses of health plan performance overall (not just MA plans) on measures from the Healthcare Effectiveness Data and Information Set (HEDIS), which make up a significant proportion of the MA measures currently in use, have shown similar patterns – plans serving beneficiaries from low-income areas or high-minority areas are more likely to perform poorly on many quality indicators, though absolute differences are relatively small.[7]

Contracts with a high proportion of dually enrolled beneficiaries or beneficiaries with disabilities have lower overall quality scores and worse star performance, on average, and consequently are much less likely to achieve the 4-star threshold associated with Quality Bonus Payments; these differences in performance thus have significant financial ramifications for contracts.[1,8] Part D measures follow a similar pattern, with lower adherence scores related to the prevalence of social risk factors in enrollees.[9] Star ratings for the plans in which rural individuals enroll at higher rates also have slightly lower Star Ratings, though the differences are smaller than those seen for the aforementioned social risk groups.[10]

C. Limitations

One important limitation is that data from performance year 2014 (payment year 2016) was used for this analysis. Though that represents the most up-to-date data available at the time of this Report, past performance does not necessarily predict future performance, and thus the policy simulations should be considered to be only estimates of the actual effect for each. Additionally, these data do not reflect new enrollees into the MA program in 2015 or 2016, and to the degree that new enrollees may differ from prior enrollees, the results may not hold equally for all groups.

In this chapter, due to data availability, disability was identified using the current reason for Medicare entitlement rather than the original reason for Medicare entitlement, as used in other chapters. The proportion of individuals with disabilities in this chapter is thus somewhat lower than in other chapters, and the population is almost entirely comprised of beneficiaries under the age of 65.

Another limitation to the analyses presented here is data availability. Because MA quality data are collected at the contract rather than the plan level, analyses of individual plans – including the special needs plans (SNPs) – are not always feasible. Because data are collected on only a sample of beneficiaries for many measures, sample size is also a limitation in terms of examining subgroups (such as dually-enrolled beneficiaries, beneficiaries with disabilities, or beneficiaries who are racial or ethnic minorities) within contracts, as measure specifications do not require that contracts sample beneficiaries in a way that is representative of these subgroups. Many measures do not apply to the under-65 population, so this group, of which nearly all have a disability and roughly half are dually-enrolled, is at particular risk of under-representation. For some measures, moreover, data are *only*

collected at the contract level, so individual analyses cannot be performed; for these measures no within-contract differences can be calculated for the social risk groups of interest.

D. Framework for the Chapter: Key Findings, Policy Simulations, Strategies, and Considerations

The remainder of this chapter is structured as follows. First, it describes underlying relationships between social risk and performance on the measures contained in the MA Quality Star Rating program. Next, it examines the performance of contracts serving beneficiaries with social risk factors on these measures, and then the performance of these contracts under the bonus scheme. Following these analytic sections, a series of policy simulations are presented. Finally, strategies and considerations for MA are presented, using the strategic framework outlined in Chapter 1: 1) measure and report quality for beneficiaries with social risk factors; 2) set high, fair standards for all beneficiaries; and 3) reward and support better outcomes for beneficiaries with social risk factors. These strategies build on each other to address social risk in Medicare payment programs.

II. Beneficiary and Provider Characteristics

A. Beneficiary Characteristics

Data from performance year 2014 (payment year 2016) were used for these analyses. In total, there were 15,282,565 beneficiaries in the MA program in 2014 included in the analytic sample, constituting roughly 97% of total MA enrollees in 2014. 18.2% were partially or fully dual-enrolled (39.0% and 61.0%, respectively), and an additional 3.6% qualified for the low-income subsidy (LIS) through the application process; 14.6% were beneficiaries with disabilities. Beneficiary characteristics are shown in Table 8.1:

Table 8.1: Beneficiary Characteristics by Social Risk Category

	Overall	Dually-enrolled/ LIS	Low-Income ZCTA*	Black	Hispanic	Rural	Disability
Beneficiaries	15,282,565	3,336,402	2,247,113	1,480,569	1,304,237	1,904,159	2,237,932
Female	56.7%	63.2%	57.2%	61.4%	55.2%	54.5%	51.4%
Mean Age	71.1	66.8	69.3	69.4	71.3	70.46	55.2
Dually-enrolled/LIS	21.8%	100%	40.4%	43.7%	47.9%	19.9%	50.1%
Low-Income ZCTA*	15.0%	27.9%	100%	39.1%	26.2%	31.3%	23.9%
Race: White	63.3%	43.1%	44.8%	0%	0%	77.0%	54.4%
Black	9.7%	19.4%	24.5%	100%	0%	6.2%	17.2%
Hispanic	8.5%	18.7%	14.8%	0%	100%	2.1%	10.0%
Other	3.8%	5.8%	1.9%	0%	0%	1.0%	2.5%
Unknown	14.7%	13.0%	13.6%	0%	0%	13.7%	16.0
Rural	12.5%	11.4%	26.1%	8.0%	3.1%	100%	14.8%
Current Disability	14.6%	33.6%	23.2%	25.9%	17.1%	17.3%	100%
*= individual lives in a ZCTA in the bottom quintile of median income. ZCTA=ZIP code tabulation area.							

For the purposes of these analyses, fully dual-enrolled, partially dual-enrolled, and low-income subsidy beneficiaries were considered in a single group. This was based on preliminary analyses showing that performance on the quality measures for partial dually-enrolled beneficiaries was much more similar to

performance for full dually-enrolled beneficiaries than to performance for non-dually-enrolled beneficiaries (Appendix Table 8.2).

B. Contract Characteristics

After excluding contracts without 2015 Star Ratings (those that were too new to be rated or too small to be rated), the analytic sample was made up of 505 contracts. These contracts fall into three basic categories: health maintenance organizations (HMOs), preferred provider organizations (PPOs), and private fee-for-service (PFFS) arrangements. The majority of contracts were HMOs and PPOs, while PFFS arrangements were relatively rare. More contracts were for-profit than non-profit (Table 8.2), but these patterns differed somewhat by social risk breakdown. Beneficiaries in contracts disproportionately serving beneficiaries with social risk factors were much more likely to be dually-enrolled, low-income, Black, Hispanic, rural, and/or have a disability:

Table 8.2: Contract Characteristics

	Overall	High-Dual/LIS	Low-Income ZCTA	High-Black	High-Hispanic	Rural	High-Disabled
Contracts							
N Contracts	505	102	101	102	101	102	102
N Enrollees	15,282,565	619,812	1,549,797	1,793,453	3,783,031	3,534,268	826,702
% HMO	69.3%	88.2%	81.2%	87.3%	92.1%	37.3%	90.2%
% PPO	25.4%	11.8%	14.9%	9.8%	6.9%	46.1%	7.8%
% PFFS	1.6%	0.0%	2.0%	1.0%	0.0%	6.9%	2.0%
% Other	3.8%	0.0%	2.0%	2.0%	1.0%	9.8%	0.0%
% For-Profit	68.5%	63.7%	75.3%	79.4%	70.3%	57.8%	68.6%
% Non-Profit	31.5%	36.3%	24.8%	20.6%	29.7%	42.2%	31.4%
Beneficiaries							
% Dually-enrolled/LIS	35.9%	95.3%	63.9%	56.7%	57.9%	30.5%	80.0%
% Low-ZCTA	17.2%	27.3%	42.8%	32.8%	26.5%	19.7%	30.6%
% Black	13.8%	22.5%	30.4%	42.1%	16.5%	8.2%	26.1%
% Hispanic	10.4%	18.9%	21.4%	11.7%	37.5%	3.6%	16.4%
% Rural	12.8%	12.4%	16.0%	5.7%	4.1%	46.3%	13.9%
% with Disability	20.8%	39.5%	34.5%	32.7%	26.0%	21.2%	47.9%

HMO=health maintenance organization; PFFS=private fee-for-service; PPO=preferred provider organization; ZCTA=ZIP code tabulation area

There was a significant overlap between these groups, particularly dual and disabled. At the contract level, roughly 70% of the contracts in the highest quintile by proportion of dual enrollees were also in the highest quintile for disabled enrollees, and vice versa.

III. Beneficiary Social Risk Factors and Performance on MA Quality Metrics

The first research question was whether there was a relationship between social risk and performance on the MA quality metrics. The use of the word "performance" is not meant to imply that the beneficiaries themselves are responsible for the outcome – rather, it is used to indicate whether individuals receive the quality measure at hand. It is used interchangeably with "outcome" to indicate whether or not a beneficiary had, for example, appropriate cancer screening, blood pressure control, or treatment for osteoporosis.

Both total and within-contract differences were examined; total difference reflects the combined impact of patient and contract factors, while within-contract differences attempt to isolate patient factors. Because beneficiaries in the same contract are more likely to see the same providers and have the same benefits, differences in quality measures between beneficiaries with versus without social risk factors within a contract are more likely to represent differences in the difficulty of caring for different patient groups. However, differences within contracts are likely to be only a lower bound on the full impact of social risk. Since caring for disadvantaged populations is likely to require more resources, contracts that do so may have inadequate resources to optimally address all areas of clinical need.

Total and within-contract disparities for 19 of the performance measures currently in the MA program, which represent nearly half of the total score for each contract, were examined. These measures were selected because they were beneficiary-level measures, which allowed the examination of within-contract disparities. For the three measures that already control for either medical or social risk factors ("improving or maintaining physical health," "improving or maintaining physical health," and "all-cause readmissions"), these adjustments were included in the calculations, such that the displayed results represent the risk associated with each social risk factor from within the specified model, after also accounting for the other factors included in the models. Though the 10 patient experience measures from the CAHPS surveys are patient-level data, these were only examined at the contract level since they only represent a sample of individuals rather than all individuals in the contract. The four plan operations measures, which include elements like the responsiveness of the call center, are not collected at the patient level and thus were only examined at the contract level.

Overall, performance on many of the measures was very good – for example, 83% of beneficiaries had their blood sugar adequately controlled, and 94% of beneficiaries had appropriate monitoring of kidney function if they were diabetic. Performance was lower for a few of the measures: for example, monitoring physical activity (51% of beneficiaries successfully met the measure) and osteoporosis management in women with a prior fracture (40% of beneficiaries successfully met the measure).

Within-contract disparities are shown in Table 8.3, and total disparities are shown in Appendix Table 8.3. In 16 out of 19 measures examined, performance was worse for dual/LIS beneficiaries within a contract (Table 8.3). Effect sizes ranged from an odds ratio of 0.68 for having blood sugar adequately controlled to 0.93 for monitoring kidney function. (An odds ratio of 0.68 means that dual/LIS beneficiaries have

32% lower odds of having their blood sugar controlled than non-dual/non-LIS beneficiaries. Another way to explain the meaning of an odds ratio of 0.68 is that dual/LIS beneficiaries are less likely to have their blood sugar controlled than non-dual/LIS beneficiaries. The odds ratio of 0.93 for monitoring kidney function means that dual/LIS beneficiaries have 7% lower odds of having their kidneys appropriately monitored than non-dual/-LIS beneficiaries.)

On the other hand, dual/LIS status had no relationship with performance for Monitoring Physical Activity and Adult BMI Assessment, and dual/LIS beneficiaries performed better on the measure concerned with reducing the risk of falling (an odds ratio of greater than one indicates better performance). Similar patterns were seen for low-income beneficiaries as defined by ZCTA income (12/19 measures worse, 2 better, 5 no relationship), rural beneficiaries (15 measures worse, 1 better, 3 no relationship), and beneficiaries with disabilities (14 measures worse, 3 better, 2 no relationship). Mixed performance was seen for Black beneficiaries (9 measures worse, 6 better, 4 no relationship); performance was better for Hispanic beneficiaries (4 measures worse, 12 better, 3 no relationship).

Total disparities (Appendix Table 8.3) and within-contract disparities were similar, suggesting that the majority of the difference in performance between socially at-risk and non-beneficiaries with social risk factors on the measures examined for this analysis were due to patient factors rather than contract performance.

When all social risk factors were entered into a single model, the results were largely unchanged (Appendix Table 8.4), suggesting that the risk factors each have independent effects.

Table 8.3: Social Risk and MA Beneficiary-Level Measure Performance, Odds of Successfully Attaining Measure, Within-Contract Effects, 2014

Domain/Measure	Average Performance	Dually-enrolled /LIS	Low-Income ZCTA	Black	Hispanic	Rural	Disabled
Staying Healthy: Screenings, Tests, Vaccines							
Breast Cancer Screening	76.4%	**0.72**	**0.99**	**1.32**	**1.30**	**0.92**	**0.85**
Colorectal Cancer Screening	71.7%	**0.82**	**0.93**	**1.11**	**1.19**	**0.76**	**0.85**
Annual Flu Vaccine	73.5%	**0.78**	**0.83**	**0.61**	**1.09**	**0.83**	**0.74**
Improving or Maintaining Physical Health*	73.2%	**0.92**	0.99	1.00	0.98	1.01	**0.86**
Improving or Maintaining Mental Health*	79.1%	**0.81**	**0.90**	**0.85**	1.01	**0.94**	0.96
Monitoring Physical Activity	50.8%	0.98	**0.95**	**1.22**	**1.25**	**0.79**	**1.22**
Adult BMI Assessment	97.0%	1.01	1.00	0.99	**1.41**	**0.81**	**0.90**
Managing Chronic (Long Term) Conditions							
Osteoporosis Management in Women who had a Fracture	39.9%	**0.79**	0.97	**0.86**	**1.09**	**0.91**	**0.70**
Diabetes– Eye Exam	76.7%	**0.82**	**0.93**	1.00	**1.15**	**0.82**	**0.64**
Diabetes– Kidney Disease Monitoring	94.1%	**0.93**	1.00	**1.29**	**1.20**	**0.80**	**0.71**
Diabetes– Blood Sugar Controlled (reverse-coded)	83.2%	**0.68**	**0.83**	**0.79**	**0.83**	**0.92**	**0.61**
Controlling Blood Pressure	70.4%	**0.88**	**0.89**	**0.66**	1.03	**0.95**	**0.83**
Rheumatoid Arthritis Management	78.8%	**0.90**	**0.89**	**0.95**	**1.06**	**0.92**	**1.06**
Reducing the Risk of Falling	59.9%	**1.75**	**1.18**	**1.49**	**1.29**	**0.85**	**1.32**
Plan All-Cause Readmissions (reverse-coded)*	86.9%	**0.91**	0.99	1.01	**1.07**	**0.97**	1.02
Drug Safety and Accuracy of Drug Pricing							
High-Risk Medication (reverse coded)	93.7%	**0.73**	**1.03**	**1.31**	**1.35**	**0.97**	**0.57**
Medication Adherence for Diabetes Medications	78.0%	**0.92**	**0.84**	**0.62**	**0.85**	**1.03**	**0.73**
Medication Adherence for Hypertension	80.3%	**0.83**	**0.83**	**0.63**	**0.85**	0.99	**0.69**
Medication Adherence for Cholesterol	76.4%	**0.88**	**0.82**	**0.60**	**0.72**	1.00	**0.76**

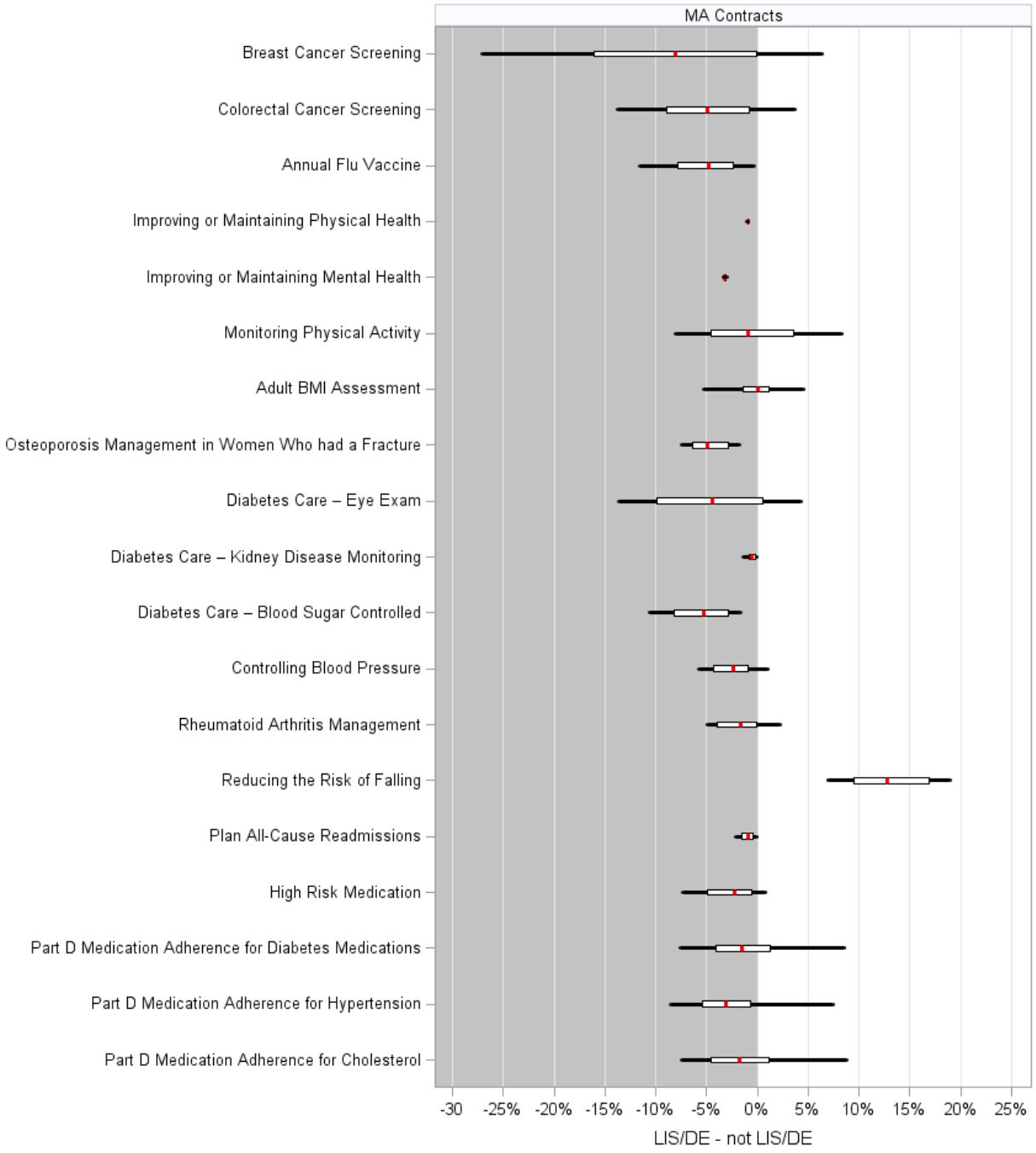
*=measure controls for medical or social risk factors; all measure-specified factors were included in these models, so results represent odds after adjustment. BMI=body mass index. Separate analyses were conducted for each group. Models control for between-contract differences. All bolded comparisons significant at p<0.05.

These analyses thus show evidence of a significant within-contract impact of a number of social risk factors on performance on individual measures in the Star Ratings. Note, however, that since none of these measures are adjusted for clinical risk (with the exception of improving or maintaining physical health and improving or maintaining mental health, which are already adjusted for age, gender, race and ethnicity, income, education, marital status, Medicaid eligibility, SSI eligibility, homeowner status, chronic conditions, and baseline health status; and readmissions, which is adjusted for age and comorbidities), the analyses do not reveal whether the differences are due to the social risk factor itself or to the fact that beneficiaries with social risk factors are also at high medical risk and vice versa.

Analyses were next conducted to determine whether the relationship between social risk and quality measure performance was similar across contracts. If so, it suggests more strongly that social risk has a persistent underlying relationship with the outcomes of interest. If not, it suggests that some contracts have been able to reduce or eliminate this disparity. Logistic regression models were run to calculate the difference between the odds of meeting the quality measure for dual/LIS versus non-dual/LIS individuals within each contract.

Figure 8.1 shows the distribution of the effect of dual/LIS status across contracts. The red dot represents the median difference in performance for dual/LIS versus non-dual/LIS; 90% of contracts have a difference in the outcome contained in the White bar. So, for example, for breast cancer screening, the median difference between dual/LIS and non-dual/LIS beneficiaries was about 8% (the red dot in the middle of the top bar). 90% of contracts had a difference in rates between dual/LIS and non-dual/LIS women that is between roughly -2 and -17% (the White bar), and nearly all contracts had worse performance for dual/LIS women (the entire bar, including the Black lines extending beyond the White bar). For “diabetes care – blood sugar controlled,” the effect was even more consistent, with 90% of contracts demonstrating a -3 to -8% difference in this outcome between dual/LIS and non-dual/LIS beneficiaries. On the other hand, the effect for reducing the risk of falling was consistently in favor of dual/LIS beneficiaries, with 90% of contracts between a 9 and 17% higher performance in these beneficiaries.

Figure 8.1: Variability of Effect of Dually-enrolled/LIS Status, 2014*



*=Note that three measures, improving or maintaining physical health, improving or maintaining mental health, and plan all-cause readmissions, control for medical or social risk factors; all measure-specified factors were included in these models, so results represent the odds ratio calculated from within the model (and applied to the measure).

Findings for the other social risk factors examined (ZCTA income, Black, Hispanic, rural, and disabled) were similar (Appendix Figure 8.1).

Collectively, the findings presented in this section suggest that there is a small to moderate, relatively consistent, within-contract relationship between social risk and performance for some measures in the MA Star Ratings. These relationships were primarily negative for dual/LIS status, low-income ZCTA, rural residence, and disability, and more mixed (both positive and negative) for race and ethnicity.

IV. Contract Social Risk Makeup and Performance on MA Quality Metrics

The next set of analyses aimed to determine whether, independent of beneficiary social risk factors, the proportion of beneficiaries with social risk factors in a contract was associated with quality and outcomes for enrolled individuals. The analyses were run at the patient level as described above, but this time the primary predictor was whether a contract was in the top quintile for each of the social risk factors of interest, after controlling for beneficiary social risk. Table 8.4 displays these findings. For example, looking at the first row of the table, average performance on breast cancer screening was 76.4%. In contracts with a high proportion of beneficiaries who have dual/LIS status, the odds of any beneficiary receiving breast cancer screening, even after controlling for whether the beneficiary herself was dual/LIS, was 0.80. This suggests that beneficiaries in high-dual/LIS contracts had 20% lower odds of receiving breast cancer screening than beneficiaries in other contracts. This contract effect may be a signal of lower quality of care, irrespective of beneficiary makeup.

In general, contract social risk had a smaller effect than beneficiary social risk, particularly for high dual/LIS contracts; fewer measures were significantly associated with contract type, and the odds ratios were closer to 1.

Table 8.4: Contract Social Risk and MA Beneficiary-Level Measure Performance, Odds of Successfully Attaining Measure, 2014

Domain/Measure	Average Performance Across All Contracts	High-Dual/LIS	Low-Income ZCTA	High-Black	High-Hispanic	Rural	High-Disabled
Staying Healthy: Screenings, Tests, Vaccines							
Breast Cancer Screening	76.4%	**0.80**	0.84	0.88	1.49	**0.75**	**0.67**
Colorectal Cancer Screening	71.7%	**0.58**	1.20	**0.67**	0.90	0.74	**0.60**
Annual Flu Vaccine	73.5%	1.04	**0.79**	**0.84**	**0.85**	0.98	**0.77**
Improving or Maintaining Physical Health	73.2%	0.95	0.96	1.02	0.97	1.00	**0.94**
Improving or Maintaining Mental Health	79.1%	0.94	**0.95**	**0.95**	0.95	1.03	0.95
Monitoring Physical Activity	50.8%	1.07	0.94	0.98	**1.09**	**0.92**	0.97
Adult BMI Assessment	97.0%	**0.37**	**0.38**	**0.40**	**2.29**	**0.31**	**0.31**
Managing Chronic (Long Term) Conditions							
Osteoporosis Management in Women who had a Fracture	39.9%	**0.65**	1.07	1.23	1.98	**0.57**	0.79
Diabetes– Eye Exam	76.7%	0.97	**0.62**	**0.59**	**1.82**	**0.68**	**0.70**
Diabetes– Kidney Disease Monitoring	94.1%	**0.67**	0.73	0.65	**2.34**	**0.57**	**0.67**
Diabetes– Blood Sugar Controlled (reverse-coded)	83.2%	**0.63**	**0.48**	0.60	**1.97**	**0.63**	**0.48**
Controlling Blood Pressure	70.4%	0.97	**0.73**	**0.76**	**0.85**	0.92	**0.77**
Rheumatoid Arthritis Management	78.8%	**0.84**	**0.81**	**0.79**	0.89	1.01	**0.72**
Reducing the Risk of Falling	59.9%	**1.38**	**1.20**	**1.11**	**1.23**	**0.90**	**1.47**
Plan All-Cause Readmissions (reverse-coded)	86.9%	**1.06**	**0.88**	**0.88**	**0.98**	**0.98**	**0.92**
Drug Safety and Accuracy of Drug Pricing							
High-Risk Medication (reverse coded)	93.7%	0.99	1.15	1.02	**1.19**	0.86	0.98
Medication Adherence for Diabetes Medications	78.0%	1.01	**0.81**	**0.83**	1.03	0.92	**0.81**
Medication Adherence for Hypertension	80.3%	0.97	**0.76**	**0.80**	0.99	0.94	**0.75**
Medication Adherence for Cholesterol	76.4%	0.99	**0.76**	**0.81**	1.03	0.97	**0.78**

BMI=body mass index. Separate analyses were conducted for each group. Models control for between-contract differences. All bolded comparisons significant at p<0.05.

The evidence thus suggests a small to moderate impact of a contract's social risk makeup on performance on individual patient-level measures under the quality star measures. Again, because these measures are, for the most part, not risk-adjusted, these analyses do not determine whether any differences are due to other underlying differences in patient population.

Performance on contract-level measures was also examined; here, the effect is the difference in scores between contracts with high versus low levels of the social risk factor in question rather than the odds of meeting a performance measure at the individual level. While examining contract-level measures cannot demonstrate whether differences are driven by within- or between-contract effects (patient factors or contract factors), such analyses are critical to understanding why the contracts of interest do worse. Such information may be important to determining what types of interventions might help these contracts do better - for example, if high-dual/LIS contracts did very poorly in the drug plan customer service domain or if rural contracts performed poorly in beneficiary access, these could be important pieces of information for quality improvement efforts.

Table 8.5 shows performance on contract-level measures by contract social risk levels. The biggest differences in performance were seen for the domain “Managing Chronic (Long Term) Conditions”, where contracts with a high proportion of beneficiaries with social risk factors performed up to 18 points worse on some measures. In the “Member Experience with Health Plan” domain, which is already adjusted for dual/LIS status and educational attainment, most of the high-social-risk contract groups performed worse than average, though the differences here were smaller than seen when examining patient-level metrics:

Table 8.5: Contract Social Risk and MA Contract-Level Measure Performance, Difference in Rates of Achieving Measure, 2014

Domain/Measure	Average Performance	High-Dual/LIS	Low-Income ZCTA	High-Black	High-Hispanic	Rural	High-Disabled
Managing Chronic (Long Term) Conditions							
Special Needs Plan (SNP) Care Management	59.1	**-8.7**	**-13.6**	-5.7	**-11.2**	**-9.7**	**-16.4**
Care for Older Adults – Medication Review	85.2	-3.2	**-8.1**	**-7.6**	**-5.0**	-1.4	**-5.7**
Care for Older Adults – Functional Status Assessment	75.4	**-6.3**	**-16.9**	**-9.6**	**-9.5**	-4.3	**-17.9**
Care for Older Adults – Pain Assessment	86.3	-2.6	**-8.7**	**-6.6**	**-6.5**	0.6	**-8.3**
Member Experience with Health Plan							
Getting Needed Care	83.3	**-2.2**	-0.3	**-1.4**	**-3.4**	**2.3**	**-2.3**
Getting Appointments and Care Quickly	75.8	**-1.9**	**-2.6**	**-2.8**	**-3.8**	**1.7**	**-2.3**
Customer Service	87.2	**-2.1**	-0.2	**-1.2**	**-2.0**	**1.8**	**-2.0**
Overall Rating of Health Care Quality	85.4	**-1.5**	**-0.8**	**-1.5**	**-1.5**	**0.7**	**-1.8**
Overall Rating of Plan	84.2	0.3	-0.2	**-1.5**	-0.1	0.8	-0.7
Care Coordination	85.1	**-1.6**	**-1.1**	-0.5	**-2.9**	**1.2**	**-1.8**
Member Complaints/Changes in Health Plan Performance							
Complaints about the Health Plan	0.2	-0.0	**0.1**	**0.2**	**0.1**	**-0.1**	**0.1**
Members Choosing to Leave the Plan	11.8	-0.5	**4.7**	**6.5**	**4.5**	**-3.9**	**2.0**
Beneficiary Access and Performance Problems	83.1	**7.7**	2.4	1.3	-0.1	2.1	0.1
Health Plan Customer Service							
Plan Makes Timely Decisions about Appeals	94.1	-1.4	**-6.0**	**-4.5**	-2.9	**-4.2**	-3.1
Reviewing Appeals Decisions	89.3	-1.9	-0.3	2.0	-1.4	**-3.0**	-1.7
Call Center - Foreign Language and TTY Availability	89.9	**-5.1**	**-6.6**	**-2.5**	**-4.7**	-1.3	**-4.3**
Drug Plan Customer Service							
Call Center - Foreign Language and TTY Availability	90.0	**-4.5**	**-5.8**	-2.4	**-5.3**	-1.0	**-3.9**
Appeals Auto–Forward	3.9	2.8	-0.1	-0.9	0.4	1.1	**3.7**
Appeals Upheld	76.0	-1.7	0.5	-4.0	4.0	0.5	-1.9
Member Complaints/Changes in Drug Plan Performance							
Complaints about the Drug Plan	0.2	-0.0	**0.1**	**0.2**	**0.1**	**-0.1**	**0.1**
Members Choosing to Leave the Plan	11.8	-0.5	**4.7**	**6.6**	**4.6**	**-4.1**	**2.0**
Beneficiary Access and Performance Problems	83.0	**7.9**	2.5	1.5	0.1	1.8	0.3
Member Experience with Drug Plan							
Rating of Drug Plan	83.6	**0.9**	0.4	-0.4	**0.7**	0.2	-0.2
Getting Needed Prescription Drugs	90.1	**-1.2**	**-0.9**	**-1.2**	**-2.0**	**1.3**	**-1.6**
Drug Safety and Accuracy of Drug Pricing							
Medicare Plan Finder Price Accuracy	98.4	-0.0	0.1	0.2	0.0	-0.1	0.1

These findings suggest that contracts with a high proportion of beneficiaries with social risk factors are less likely to perform well on chronic care management and patient experience measures (which are already adjusted for dual/LIS and education). However, as these are contract-level analyses, no conclusions can be drawn about within- versus between-contract effects.

V. Social Risk and Performance Under the Star Rating Program

As noted above, the quality measures assessed across Part C and Part D performance fall into a number of distinct domains. Performance was worse on multiple domains for MA contracts disproportionately serving beneficiaries with social risk factors, as shown in Table 8.6. For example, the high dual/LIS contracts scored the lowest in the "staying healthy" domain (first row), at 2.81 stars compared to 3.30 stars overall; the only domains on which high dual/LIS contracts numerically outperformed the overall average across contracts were in "managing chronic conditions" (3.35 versus 3.33) and "member complaints and changes in health plan performance" (4.27 vs. 4.03) and "member complaints and changes in drug plan performance," (4.32 versus 4.11), which include the improvement measures:

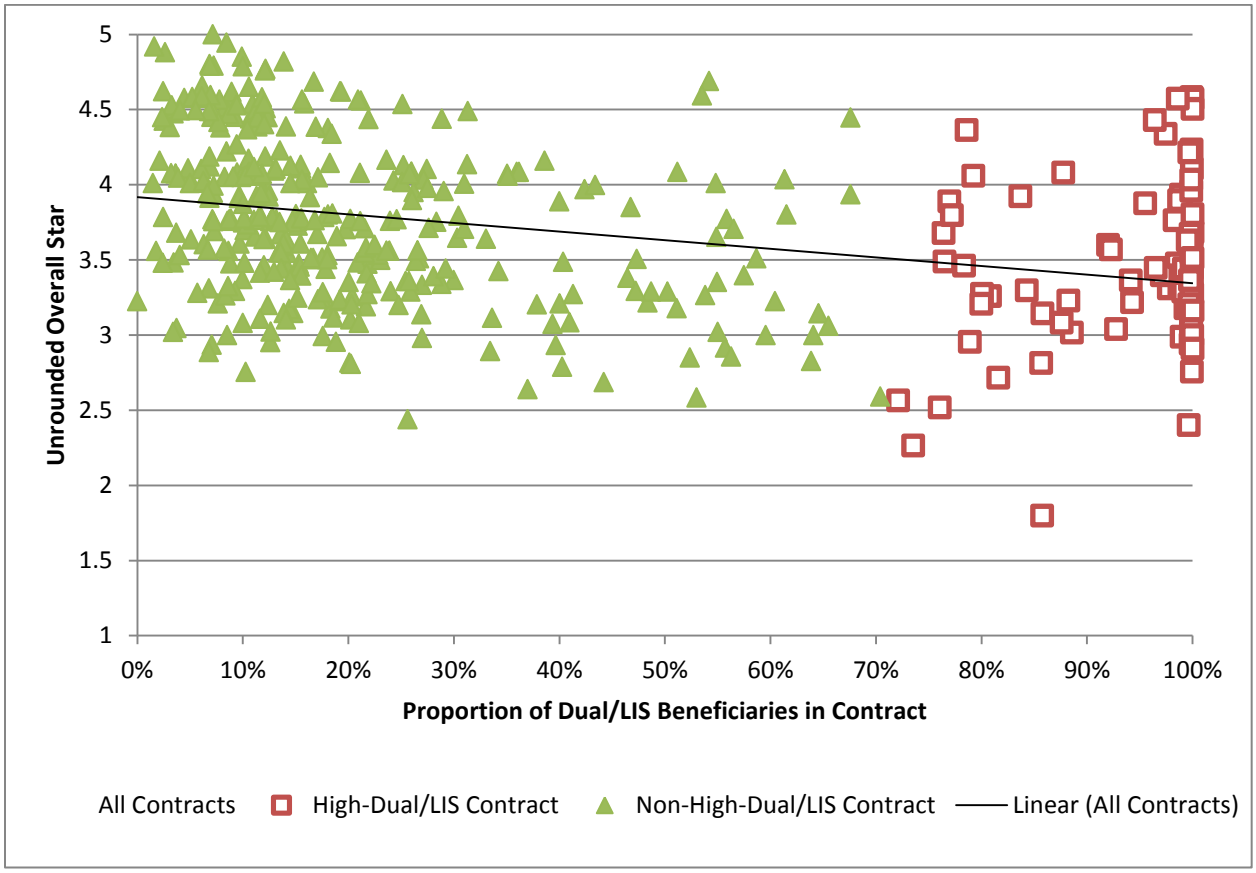
Table 8.6: Contract Social Risk and Domain Performance

Domain	Average (SD)	High-Dual/LIS	Low-Income ZCTA	High-Black	High-Hispanic	Rural	High-Disabled
Staying Healthy: Screenings, Tests, Vaccines	3.30 (0.70)	2.81 (0.66)	2.88 (0.70)	3.00 (0.75)	3.21 (0.61)	3.10 (0.69)	2.79 (0.59)
Managing Chronic (Long-Term) Conditions	3.33 (0.68)	3.35 (0.84)	3.04 (0.75)	3.13 (0.79)	3.28 (0.63)	3.16 (0.59)	3.01 (0.71)
Member Experience with Health Plan	3.42 (0.99)	2.93 (0.90)	3.11 (0.88)	2.93 (0.87)	2.76 (0.89)	3.84 (0.83)	2.81 (0.81)
Member Complaints/Changes in Health Plan Performance	4.03 (0.72)	4.27 (0.71)	3.85 (0.73)	3.73 (0.67)	3.92 (0.77)	4.13 (0.64)	3.96 (0.81)
Health Plan Customer Service	4.14 (0.81)	3.92 (0.89)	3.98 (0.88)	4.15 (0.75)	3.96 (0.90)	3.85 (0.80)	3.82 (0.83)
Drug Plan Customer Service	4.42 (0.87)	4.29 (0.91)	4.36 (0.83)	4.49 (0.82)	4.34 (0.84)	4.36 (0.96)	4.20 (0.92)
Member Complaints/Changes in Drug Plan Performance	4.11 (0.74)	4.32 (0.71)	4.01 (0.78)	3.78 (0.76)	4.02 (0.73)	4.28 (0.60)	4.04 (0.86)
Member Experience with Drug Plan	3.52 (1.05)	3.31 (1.02)	3.51 (0.99)	3.21 (1.04)	3.25 (0.96)	3.88 (0.90)	3.20 (0.96)
Drug Safety and Accuracy of Drug Pricing	3.76 (0.54)	3.53 (0.61)	3.44 (0.56)	3.40 (0.59)	3.57 (0.61)	3.75 (0.48)	3.38 (0.62)

SD=standard deviation

Performance on the individual measures is rolled up to a total Star Rating (note that the domains are unweighted means and the overall and summary ratings are weighted means). The total Star Rating tends to be lower for contracts with a high proportion of dually-enrolled beneficiaries, as shown in Figure 8.2:

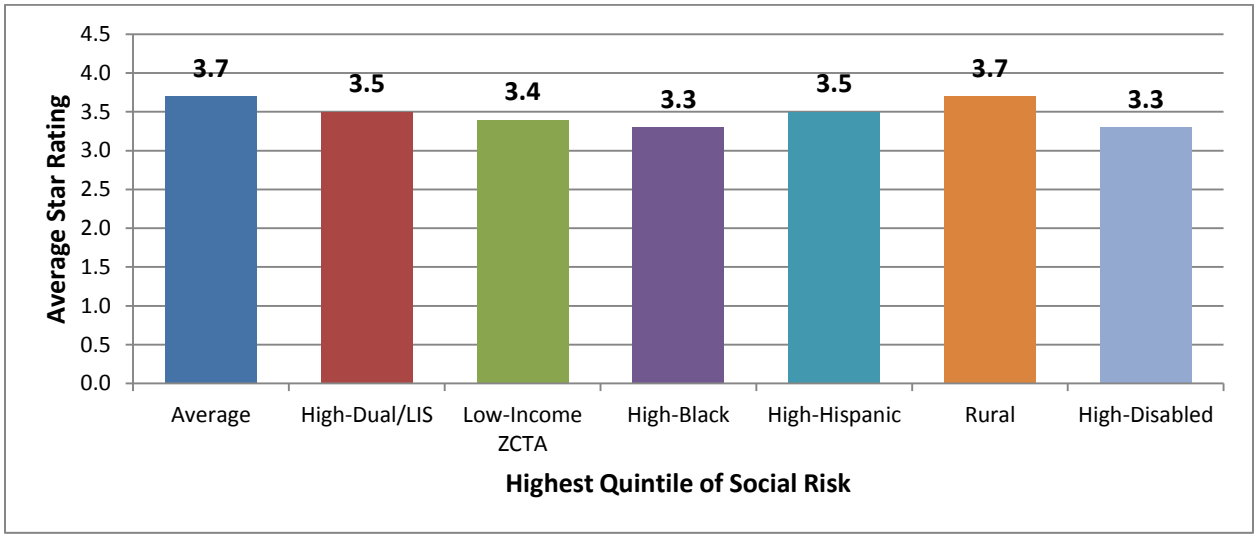
Figure 8.2: Relationship Between Proportion Dual/LIS and Quality Star Rating



While the lowest performers (those at 2.5 or fewer stars) were largely concentrated among the high-dual/LIS contracts and the highest performers (those at 4.5 or more stars) were largely concentrated among very low-dual/LIS contracts, there were some contracts with a high proportion of dual/LIS beneficiaries that attained high Star Ratings.

Similar patterns were seen for other measures of social risk, as shown in Figure 8.3 below. Results were similar when weighted for patient population (e.g. average Star Rating in the highest quintile of dual/LIS beneficiaries was 3.49 with weighting versus 3.52 without), suggesting that these results were not driven primarily by disproportionate enrollment of dual/LIS beneficiaries in poor-performing small contracts.

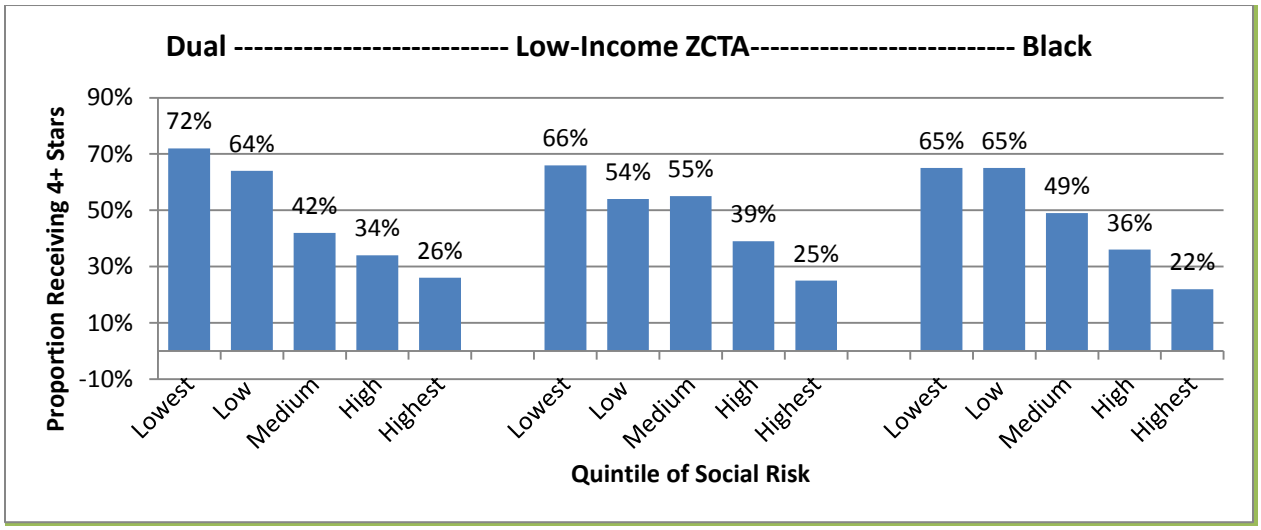
Figure 8.3: Contract Social Risk and Quality Star Rating

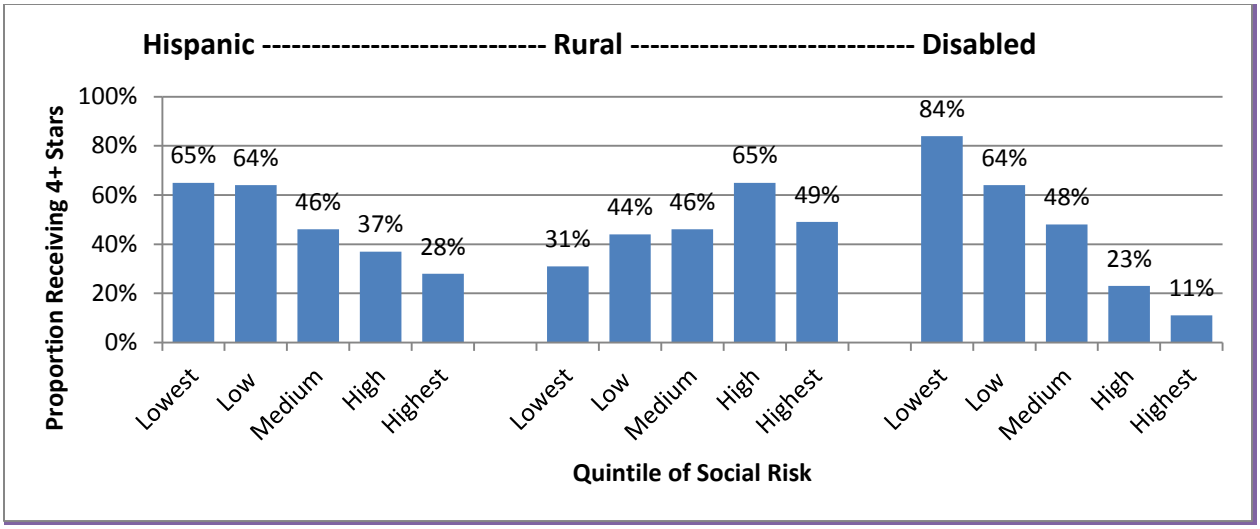


These relatively modest differences in average score translated into very different likelihoods of achieving a 4-Star rating or higher, which rewards MA contracts with a Quality Bonus Payment and thus has significant financial ramifications. In Figure 8.4, contracts are shown further divided into quintiles of social risk to demonstrate the continuous nature of these relationships, with the "highest" quintile corresponding to the "high-dual" (or "high-Black", etc.) category on the preceding tables.

Performance was very different by quintile of social risk. For example, while over 70% of contracts with the lowest proportion of dual/LIS individuals achieved 4+ stars, only 26% of those with the highest proportion of dual/LIS individuals did so. Findings were even more striking for disability, with only 11% of contracts in the highest quintile of disabled individuals performing at the 4-star threshold or higher. Contracts in the highest quintile for Black and Hispanic beneficiaries also performed more poorly than contracts with fewer racial and ethnic minorities. Patterns were not as striking for rural residence.

Figure 8.4: Contract Social Risk and Likelihood of Achieving Four or More Stars





Overall, these analyses suggest a strong relationship between contract social risk makeup and performance under the MA Star Rating Program. As noted previously, this may have significant financial consequences for contracts.

VI. Policy Options

A. Introduction

Policy options are simulated, and weighed against the policy criteria outlined in Chapter 1 to ultimately inform strategies and considerations for accounting for social risk. Those policy criteria are reiterated in Table 8.7:

Table 8.7: Policy Criteria

Policy Criteria
1. Encourages reduction in disparities in quality and outcomes
2. Protects beneficiaries' access to care by reducing disincentives to caring for high-risk populations
3. Protects providers from unfair financial stress
4. Adjusts only for the difference in performance related directly to the social risk factor, and only for what is beyond provider control
5. Promotes transparency to facilitate consumer choice
6. Supports delivery system reform and Alternative Payment Models (less relevant to the MA setting but included for consistency)

How policymakers weight these criteria could differ. For example, some may feel that protecting providers from unfair financial stress is the most important criterion, and may be willing to adjust for factors under providers' control or negatively impact transparency to achieve that goal. On the other hand, some may feel that transparency is the most important criterion, and argue that avoiding financial stress for providers or promoting delivery system reform are less important policy considerations.

Five main types of policy options are presented and modeled using 2014 data: keeping the status quo, adjusting for social risk, stratifying, rewarding improvement more highly, and providing a bonus for high performance for beneficiaries with social risk factors. Note that "status quo" here reflects the 2014 data used for 2016 Star Ratings, and does not reflect any of the changes finalized in April 2016 that will apply to the 2017 Star Ratings. Also note that none of the policy options considered address the MA payment system – all policy options are concerned with the quality measures and the Quality Star Rating program, not the risk adjustment methodology used for contract payment.

Dually-enrolled/LIS beneficiaries and the contracts that provide their coverage were the major areas of focus, for reasons outlined earlier in this report. Table 8.8 below provides an overview of the policy options, and the text that follows provides additional discussion of each; detailed methodology for each simulation is provided in Appendix Chapter 8.

Table 8.8: Summary of Policy Options

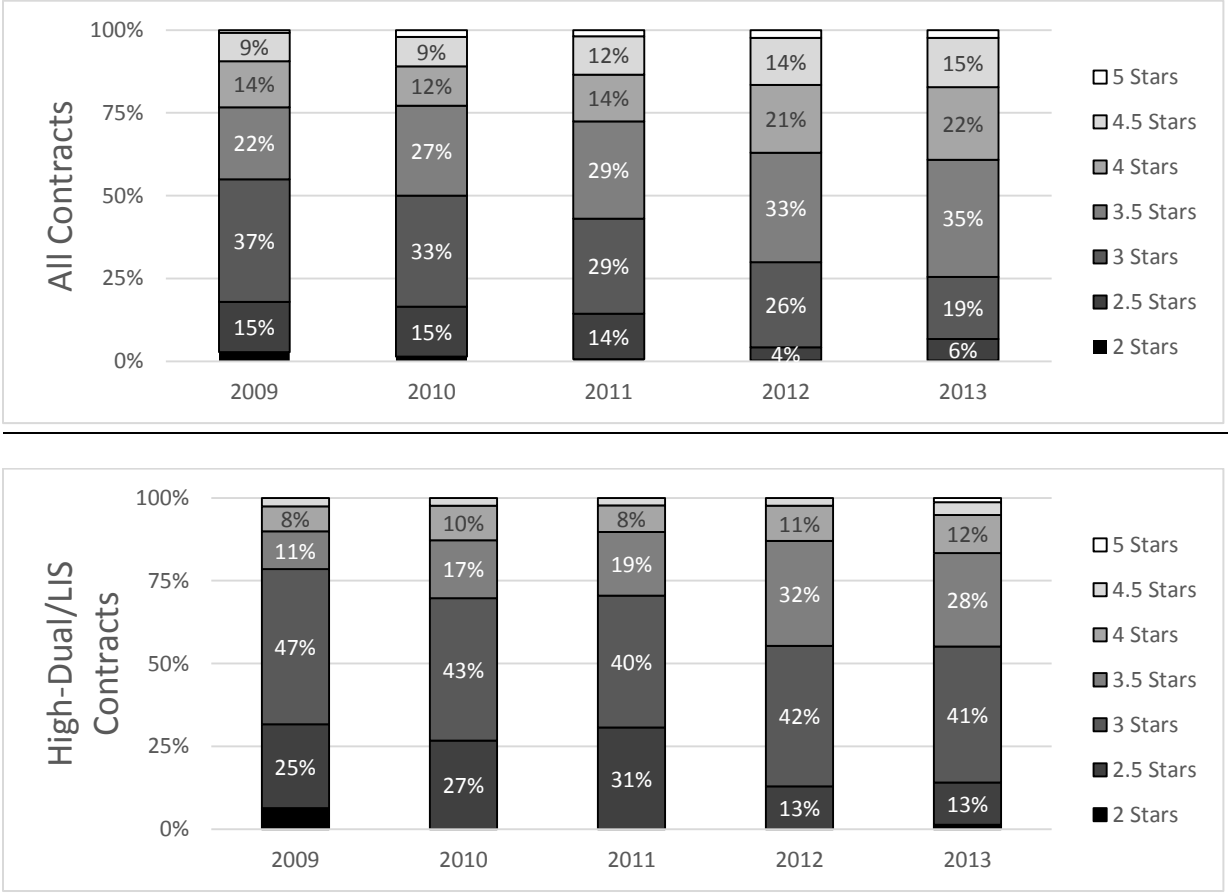
Option Title	Specifics of Option	Pros	Cons
1. Status Quo	Make no changes to the current (2016) program	• Promotes transparency to facilitate consumer choice	• Does not address issue of social risk
2. Adjust quality measures for social risk	a) Adjust quality measures by adding the social risk factor to a clinical risk adjustment model for each patient-level quality measure (note this does NOT refer to the risk adjustment applied to payments). b) Use a disparity index to adjust performance at the contract level, as laid out in the Rate Announcement and Call Letter for 2017	• Adjusts only for the difference in performance related directly to the social risk factor • May protect providers from unfair financial stress	• May discourage reduction in disparities in quality and outcomes • Reduces transparency to facilitate consumer choice • May adjust for factors within provider control • Alterations to the current measures may require re- endorsement (2a only)
3. Stratify contracts for quality assessment	a) Stratify contracts by their proportion of dual/LIS or beneficiaries with disabilities. b) Stratify beneficiaries within contracts into subgroups (“population grouping”)	• Protects beneficiaries’ access to care by reducing disincentives to caring for high-risk populations • May protect providers from unfair financial stress	• May adjust for differences in performance beyond the social risk factor • May adjust for factors within provider control • Tiers are artificial; might create unusual “cliffs” • Might discourage reduction in disparities in quality, and outcomes • Might require measure re-specification
4. Reward Improvement	Upweight the improvement measures in performance evaluation; downweight all other measures such that total available points are unchanged.	• Promotes reduction in disparities in quality and outcomes by rewarding contracts for improving, even if absolute performance remains low	• Does not directly address social risk • May penalize high-performing contracts and reward low-performing contracts
5. Provide incentives for performance for beneficiaries with social risk factors	Provide star bonuses for contracts serving a high proportion of high-risk beneficiaries that achieve high performance or improve significantly.	• Promotes reduction in disparities in quality and outcomes • Promotes transparency to facilitate consumer choice	• Without commensurate reductions in other incentives, would not be budget-neutral

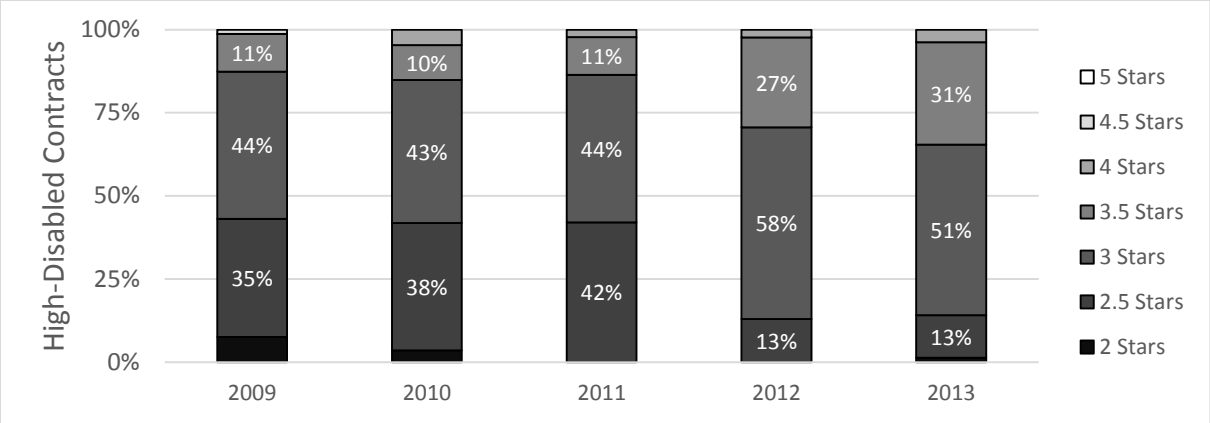
B. Policy Simulation Results

1. Status Quo

The first policy option is to continue the status quo. To see what that might look like in future years, performance was examined over the past five years to determine if there were encouraging patterns in performance, particularly for high-dual and high-disabled contracts. Analyses demonstrated significant improvements, but performance for contracts serving beneficiaries with social risk factors still lagged far behind. For example, though the proportion of contracts at 2-2.5 stars has declined over time in both the high-dual and high-disabled groups, the proportion at 4-5 stars is still very small (Figure 8.5):

Figure 8.5: Change in Performance Over Time by Social Risk (data shown are measurement year – for example, measurement year 2013 was used in Star Ratings for 2015)





These findings suggest that high-dual and high-disabled contracts are making significant and meaningful improvements, but still have a long way to go in order to qualify for financial bonuses. Some of these performance differences may reflect differences in the risk profile of contracts' underlying populations that should be taken into account; options for doing so are outlined in the following sections.

2. Adjustment for Social Risk

Adjustment for social risk can be accomplished in a number of ways. Two were modeled: adjusting for social risk within the measure itself, and using a disparity index to adjust performance at the contract level.

The first type of adjustment that was modeled was adjusting for dual/LIS status at the measure level for all clinical measures (19 measures in total – see Appendix Table 8.1a). This option is simple; adjustment can be applied at the measure level in the same way as adjustments for age, gender, or comorbidities are made. One could choose which of the measures to adjust based on analytic findings (i.e. those with the largest disparities) or based on measure type (i.e. adjust outcome measures but not process measures). Additionally, this option explicitly addresses social risk, and is responsive to some stakeholders' concerns that without adjustment, the measures are unfair. There is precedent for this approach for both dual and disabled status; CAHPS measures are already adjusted for dual/LIS status and educational attainment, and the current readmission metrics in the post-acute setting include risk-adjustment for disability as well as measures of functional status.

One drawback of this policy option is its opacity. Because the adjustment is built into the measure, the disparity is hidden, which may reduce incentives to reduce disparities (this could potentially be mitigated by using unadjusted performance for reporting and adjusted performance for payment, but it is unclear if the authority currently exists to do so). Adjustment could also risk controlling for factors that are associated with, but not directly the result of, dual enrollment, and could also risk controlling for factors that are under provider control, such as bias or discrimination. Another drawback is that adjustment within the measure would require measure stewards to change specifications; though trials of such adjustments are underway, this is generally a lengthy process.

From an implementation standpoint, this option would require measure re-specification by measure developers, as well as rulemaking. Star rating assignments under this option would need to be re-calibrated to remain budget-neutral, though that takes place on an annual basis anyhow.

The results of adjusting at the measure level are displayed in Table 8.9. Contracts in the top quintile of proportion dual/LIS beneficiaries are classified as "high-dual"; as above, this group has over 80% dual-enrolled beneficiaries on average. This simulation demonstrates that adjusting the clinical measures for dual/LIS status moves a similar number of high-dual/LIS contracts up or down a star level. However, no high dual/LIS contracts moved into the 4+ star groups, while only 3% of the low dual/LIS contracts dropped below this threshold.

Table 8.9: Adjusting 19 Clinical Measures for Dual/LIS

	All Contracts		High-Dual/LIS Contracts (top quintile)		Low-Dual/LIS (all other) Contracts	
Average Stars (baseline)	**3.73**		**3.50**		**3.78**	
Average Change in Stars	+0.01		+0.02		0.00	
Contracts Gaining Stars	42	(10%)	7	(9%)	35	(10%)
Contracts with No Change	341	(82%)	61	(82%)	280	(82%)
Contracts Losing Stars	33	(8%)	6	(8%)	27	(8%)
Contracts Rising from <4 to ≥4 stars	14	(3%)	0	(0%)	14	(4%)
Contracts Dropping from ≥4 to <4 stars	10	(2%)	1	(1%)	9	(3%)

The next approach was to adjust not at the measure level directly, but rather to adjust the Star Ratings based on a composite index that reflects the observed differences in the measures for dual/LIS or beneficiaries with disabilities within groups of contracts (see Appendix Table 8.5). This approach, which will be implemented as an interim adjustment by CMS for the 2017 Star Ratings that are released in October, 2016 and outlined in the 2017 Rate Announcement and Call Letter, is intended to approximate the impact of adjusting the measures directly, but avoids the problem of moving to non-consensus-based measures by doing so. Otherwise, the pros and cons are similar to those outlined above. Star rating assignments under this option would also need to be re-calibrated to remain budget-neutral, though as noted above this is an annually-updated program so this could take place as part of the annual calculations.

To mirror CMS implementation, the simulated approach adjusts for only 7 measures and adjusts for both dual/LIS status and disabled status. Under this option (Table 8.10), 11 (14%) high dual/LIS contracts gained stars and none lost stars; there was a stronger impact on high-dual/LIS contracts than low-dual/LIS contracts.

Table 8.10: Adjusting Quality Star Ratings using a Categorical Adjustment Index (Appendix Table 8.5)

	All Contracts		High-Dual/LIS Contracts (top quintile)		Low-Dual/LIS (all other) Contracts	
Average Stars (baseline)	**3.72**		**3.48**		**3.78**	
Average Change in Stars	+0.02		+0.06		+0.01	
Contracts Gaining Stars	13	(3%)	11	(14%)	2	(1%)
Contracts with No Change	407	(97%)	66	(86%)	341	(99%)
Contracts Losing Stars	1	(0.2%)	0	(0%)	1	(0.3%)
Contracts Rising from <4 to ≥4 stars	3	(1%)	2	(3%)	1	(0.3%)
Contracts Dropping from ≥4 to <4 stars	1	(0.2%)	0	(0%)	1	(0.3%)

3. Stratification

Stratification aims to compare "like with like" by breaking contracts, plans, or beneficiaries into two or more groups and then performing comparisons only within those groups.

Contract-Level Stratification

For contract-level stratification, contracts are judged only against other contracts with similar proportions of dually-enrolled beneficiaries, and stars are awarded based on the distribution of performance within each peer group rather than overall. These comparisons could be done at the measure, domain, or overall star level, though stratifying performance at the overall star level is the simplest – for example, the Star Rating algorithm, which assigns performance to star levels, could be run independently in two groups of contracts, high-dual/LIS and low-dual/LIS. Alternatively, the algorithm could be run once across all contracts, but then Star Ratings in each group could be re-standardized around the overall group mean.

One attraction of this option is that it recognizes that there may be unmeasurable differences in the challenges faced by contracts that serve a high proportion of dual/LIS beneficiaries. Stratification could also provide financial protection to high-dual/LIS contracts, depending on its implementation, and could reduce incentives for contracts to avoid high-risk beneficiaries, improving access to care for these groups.

The main drawback is that it may risk over-adjusting for things that are not directly related to dual/LIS status or things that are under provider control, including bias, discrimination, or the provision of poor-quality care. It also rewards different absolute levels of performance differently in one group versus another. For example, if there are 53 available "points" for a given contract, a score of 46 might translate to 4 stars if that contract has a high proportion of dual/LIS beneficiaries, while that same score might only translate to 3.5 stars if that contract has a low proportion of dual/LIS beneficiaries. This creates issues of fairness as well as of transparency, since a beneficiary seeking to choose a high-quality plan may not know whether a plan's performance is high quality in an absolute sense, or only a relative

sense, although this drawback could potentially be overcome by providing additional details on the reporting website.

This option would ideally be near budget-neutral since it would reassign both high and low stars across the two groups.

This option was modeled by re-running the entire Star Rating algorithm separately in high-dual/LIS versus low dual/LIS contracts. However, doing so led to significantly different results than anticipated (Table 8.11). Due to the clustering algorithm that the MA program uses to assign stars to measure performance, which looks for natural breakpoints in the data to assign stars rather than setting performance thresholds at percentiles or other benchmarks, breaking the contracts into two groups and then running the clustering algorithm led to, in general, tougher targets being applied to both groups. Therefore, though performance become more equal between the two groups, both had a significantly detrimental effect from this approach – on average, high-dual/LIS contracts lost 0.11 stars, and low-dual (other) contracts lost 0.22 stars. Over a third of contracts lost at least half a star overall, and 10% newly dropped below 4 stars.

Table 8.11: Adjusting Quality Star Ratings using Contract-Level Stratification

	All Contracts		High-Dual/LIS Contracts (top quintile)		Low-Dual/LIS (all other) Contracts	
Average Stars (baseline)	**3.72**		**3.48**		**3.78**	
Average Change in Stars	-0.20		-0.11		-0.22	
Contracts Gaining Stars	5	(1%)	3	(4%)	2	(1%)
Contracts with No Change	264	(63%)	55	(71%)	209	(61%)
Contracts Losing Stars	152	(36%)	19	(25%)	133	(39%)
Contracts Rising from <4 to ≥4 stars	0	(0%)	0	(0%)	0	(0%)
Contracts Dropping from ≥4 to <4 stars	43	(10%)	2	(3%)	41	(12%)

Therefore, for stratification to be practically operationalized, a different approach would likely need to be taken.

Plan-Level Stratification

In theory, stratification could also be carried out at the plan level, for example comparing Dually-enrolled Eligible Special Needs Plans (D-SNPs) with other D-SNPs, and institutional Special Needs Plans (I-SNPs) only with other I-SNPs. Advantages to this option would be that the groups are already defined and must meet specific criteria to receive the special designation already, so group distinctions would be less artificial than at the contract level. Since there are some measures that apply only to SNPs, and some measures that include very small numbers of dually-enrolled beneficiaries, this might also create the opportunity to have more targeted measures that better-reflect the needs of this particular population.

On the other hand, the main drawback of plan-level stratification is similar to contract-level stratification: it may risk over-adjusting for things that are not directly related to dual/LIS status or things that are under provider control, including bias, discrimination, or the provision of poor-quality care. Additionally, many dually-enrolled beneficiaries are not in SNPs, so such stratification would exclude a significant proportion of dual/LIS beneficiaries.

Plan-level stratification would require measure respecification (or at least new sampling design); it could be budget neutral by design, by calibrating the star ratings to reward the same percent of contracts as under the current program.

Data limitations currently preclude simulation of plan-level stratification, since quality is recorded at the contract level, and many measures' specifications are such that sampling does not reflect plan-level performance.

Beneficiary-Level Stratification

Another type of stratification is within-contract stratification at the beneficiary level, also termed "population grouping". This approach was discussed by MedPAC in their September 2015 public meeting.[2] Population grouping creates a separate benchmark for each measure for each patient population of interest. For example, if average performance on diabetes control is 40% for disabled and 60% for non-beneficiaries with disabilities, a contract serving only beneficiaries with disabilities that performed at 45% on this measure would be considered "above average" in performance.

The attraction of population grouping is that it measures the "value add" that each contract provides, given its underlying population – contracts are explicitly rewarded for doing better than average within each group, rather than based on a single standard. This approach would potentially provide financial relief to high-dual contracts, depending on performance, and could reduce the disincentives to providing care to high-risk beneficiaries.

However, a potential drawback is that it rewards different levels of performance for different populations, and may reduce incentives to reduce disparities. There are also concerns regarding whether this option could be feasibly implemented for measures that are sampled, and thus represent only a subset of a contract's members. Transparency is a potential issue for any adjustment; in this case the resulting Star Rating may actually be a more accurate reflection of a contract's "value-add" given its patient population but a less straightforward reflection of absolute performance. This concern could be addressed by displaying both overall and group-level performance as components of the public reporting efforts for MA, though such reporting could be more difficult for beneficiaries to understand and act upon.

From an implementation standpoint, beneficiary-level stratification would likely require measure re-specification and rulemaking. It could be budget-neutral if the stars were re-calibrated accordingly.

To model this option, performance was calculated using indirect standardization (a technique to combine performance across groups when the "expected" outcome is different in each, which is

particularly useful with low sample size – see Appendix Table 8.6). When this option was modeled (Table 8.12) at the individual measure level (adjusting the 19 clinical measures noted above using this approach, and then combining these new scores with the unchanged measures to re-calculate stars), it had a modest impact. 20% of contracts were impacted; the gains were predominantly seen in high dual/LIS contracts, with 15% gaining at least half a star, but only one high-dual contract moved newly into the 4+ star group.

Table 8.12: Adjusting Individual Measures using Population Grouping (via Indirect Standardization)

	All Contracts		High-Dual/LIS Contracts (top quintile)		Low-Dual/LIS (all other) Contracts	
Average Stars (baseline)	**3.73**		**3.50**		**3.78**	
Average Change in Stars	-0.05		+0.03		-0.06	
Contracts Gaining Stars	16	(4%)	11	(15%)	5	(1%)
Contracts with No Change	335	(81%)	58	(78%)	277	(81%)
Contracts Losing Stars	65	(16%)	5	(7%)	60	(18%)
Contracts Rising from <4 to ≥4 stars	1	(0%)	1	(1%)	0	(0%)
Contracts Dropping from ≥4 to <4 stars	5	(1%)	0	(0%)	5	(1%)

A more expansive approach to population grouping was also modeled, with calculations at the overall star level rather than the individual measure level. In this case, two "average" Star Ratings were calculated across all contracts: one for dually-enrolled beneficiaries and one for non-dually-enrolled beneficiaries. Contracts were then judged against an expected star, calculated as a weighted average of these stars, based on their proportion of dually-enrolled beneficiaries and non-dually-enrolled beneficiaries.

This option provides a broader adjustment than just the clinical metrics; proponents of a broader adjustment approach would argue that this is more appropriate because it recognizes that contracts with a higher proportion of beneficiaries with social risk factors might require more resources to achieve quality for their members across a broad range of activities (including patient experience, call center staffing, etc.), and not only on the clinical metrics. Opponents of such a broad-based adjustment would argue that this risks rewarding contracts for poor performance, and adjusting for factors that are under providers' control.

Similar to the prior option, from an implementation standpoint, beneficiary-level stratification to calculate stars would likely require measure re-specification and rulemaking. It could be budget-neutral if the stars were re-calibrated accordingly.

Under this approach, high-dual/LIS contracts gained more stars than under the prior option, because population grouping for overall star calculation calibrates performance based on total observed disparities across all measures rather than limiting the adjustment to only clinical measures or only within-contract disparities (Table 8.13). Modeling showed significant and strong impacts on contracts

serving a high proportion of poor or beneficiaries with disabilities, moving more than a third of high dual/LIS contracts up at least half a star, while moving approximately 6% of low-dual/LIS contracts down half a star. Under this option, 12% of high dual/LIS contracts moved newly into the 4+ star groups, while 4% of the low-dual/LIS contracts dropped newly below this threshold.

Table 8.13: Adjusting Total Stars Using Population Grouping (via Indirect Standardization)

	All Contracts		High-Dual/LIS Contracts (top quintile)		Low-Dual/LIS (all other) Contracts	
Average Stars (baseline)	**3.72**		**3.48**		**3.78**	
Average Change in Stars	+0.03		+0.19		0.00	
Contracts Gaining Stars	34	(8%)	28	(36%)	6	(2%)
Contracts with No Change	365	(87%)	49	(64%)	316	(92%)
Contracts Losing Stars	22	(5%)	0	(0%)	22	(6%)
Contracts Rising from <4 to ≥4 stars	11	(3%)	9	(12%)	2	(1%)
Contracts Dropping from ≥4 to <4 stars	13	(3%)	0	(0%)	13	(4%)

4. Rewarding Improvement (to a greater degree than the current program)

In FY 2016, the MA Star Rating Program gives the improvement measure a weight of 5 out of 51.5 for Part C and 5 out of 30.5 for Part D, or a total of 12% of the overall Star Rating. The improvement measures are composites of improvement on all improvement-eligible measures in the program (i.e. not new or respecified), calculated by summing the weighted number of measures on which a contract improved, minus the number of measures on which a contract worsened, divided by the total weighted sum of measures.

A policy option focused on improvement could upweight the improvement measures (e.g., to 25% or 50% of total score) to influence the overall quality score more strongly (see Appendix Table 8.7). Weighting improvement more heavily would potentially encourage those contracts whose performance is unlikely to meet the achievement benchmark, by rewarding them for moving in the right direction, and could provide financial relief to high-dual contracts that are showing improvement. This option is also responsive to stakeholder input, as plans have argued that they should be rewarded for significant improvement even if they have not yet achieved high quality on an absolute scale.

One potential drawback to this option is that it does not explicitly address social risk; if achievement is difficult in a socially at-risk population, improvement may also be difficult. In fact, if a plan's improvement is concentrated in populations without social risk factors, the plan could be rewarded for improvement even while disparities worsen. This option could also potentially reward contracts with low performance while failing to reward those with high performance, if the former improved while the latter did not. This would likely mean that some of the most consistently high-performing contracts would see their Star Rating diminish, which may not be desirable. Further, this option worsens problems with transparency, since a beneficiary seeking to choose a plan would be unable to determine whether the reported star represented true high performance or merely poor performance with significant

improvement from prior years. To preserve transparency, an additional reporting item or construct (one for improvement and one for attainment) might be required, though it is unclear whether the authority to do so currently exists. Additionally, it would likely be challenging to design such a system in a way that was easily interpretable for beneficiaries and successfully steered them to select higher-quality plans.

Implementation of this option would require rulemaking. It would be budget-neutral if the stars were re-calibrated as part of the program calculation, as is done annually.

Modeling this option at the 25% level, added stars to a significant number of contracts' ratings; the impact was slightly larger in high-dual/LIS contracts (Table 8.14).

Table 8.14: Upweighting Improvement to 25% of the Quality Star Rating

	All Contracts		High-Dual/LIS Contracts (top quintile)		Low-Dual/LIS (all other) Contracts	
Average Stars (baseline)	**3.72**		**3.48**		**3.78**	
Average Change in Stars	+0.01		+0.05		+0.01	
Contracts Gaining Stars	43	(10%)	14	(18%)	29	(8%)
Contracts with No Change	345	(82%)	57	(74%)	288	(84%)
Contracts Losing Stars	33	(8%)	6	(8%)	27	(8%)
Contracts Rising from <4 to ≥4 stars	16	(4%)	7	(9%)	9	(3%)
Contracts Dropping from ≥4 to <4 stars	2	(1%)	0	(0%)	2	(1%)

5. Providing Targeted Star Adjustments for High Performance for Beneficiaries with Social Risk Factors

The final policy option provides an explicit star adjustment for achieving high performance for dual/LIS beneficiaries. Three ways of applying this star adjustment directly to the Star Ratings were modeled, though this approach could also function as a separate incentive scheme.

The first option was to reward contracts that were able to achieve a 3.5-star or higher rating while enrolling a high proportion of dual/LIS or disabled individuals. There is precedent for this approach; in the physician value-based modifier program (Chapter 10), practices that meet the program-wide cost and quality criteria to receive a performance bonus and have highly medically complex patient populations are eligible for an additional 1% payment bonus (though no practices with highly complex beneficiaries met the bonus criteria in the first year of the program).[11]

The attraction of this option is that it sets a single quality standard, but gives additional rewards to contracts that are able to achieve that standard with a more challenging patient population. This gives contracts with a high proportion of beneficiaries with social risk factors both extra incentive and extra recognition for focusing on these individuals and contracts with a modestly high proportion of beneficiaries with social risk factors more of an incentive to increase their service to this group rather than avoid them.

One potential drawback to this option is that depending on where the star adjustment threshold is set, only a small proportion of contracts may qualify; further, this option would only reward those contracts that are already performing well and may do little to bring up the "floor" of the distribution.

From a budget standpoint, this option would not be budget neutral unless coupled with another change to the Quality Bonus Payment system (such as creating a scaled bonus instead of a 5% across-the-board bonus, for example).

When a star bonus equal to (0.5 stars)*(proportion dual/LIS within a contract) was applied to only those contracts that already scored at least 3.5 stars, almost two-thirds of high dual/LIS contracts received the bonus. Almost 40% of the high-dual/LIS contracts newly moved above 4 stars (Table 8.15).

Table 8.15: Targeted Star Adjustment by Social Risk for Contracts at or above 3.5 stars

	All Contracts		High-Dual/LIS Contracts (top quintile)		Low-Dual/LIS (all other) Contracts	
Average Stars (baseline)	**3.73**		**3.49**		**3.78**	
Average Change in Stars	+0.12		+0.32		+0.08	
Contracts Gaining Stars	82	(19%)	49	(64%)	33	(10%)
Contracts with No Change	342	(81%)	28	(36%)	314	(90%)
Contracts Losing Stars	0	(0%)	0	(0%)	0	(0%)
Contracts Rising from <4 to ≥4 stars	45	(11%)	29	(38%)	16	(5%)
Contracts Dropping from ≥4 to <4 stars	0	(0%)	0	(0%)	0	(0%)

The second approach modeled was to reward contracts that have a high proportion of dual/LIS or disabled individuals, but have improved significantly. The star bonus was calculated as (Part C improvement stars/10)*(percentage of dual/LIS); since the maximum improvement Star Rating is 5, this formula makes the maximum star bonus equal to 0.5 stars, as above. This star bonus was only awarded to contracts that received a Part C improvement star of 4 or 5 and that had an overall star that was less than 4 stars. This option would specifically help low-performing contracts that are making progress towards their goals, but has the downside of failing to reward those contracts that are already performing well for beneficiaries with social risk factors. Again, it would not be budget neutral without other changes to the program.

Modeling showed that this star bonus led to 26% of high dual/LIS contracts gaining at least half a star, as shown in Table 8.16.

Table 8.16: Targeted Star Adjustment for Improvement for Contracts below 4 stars

	All Contracts		High-Dual/LIS Contracts (top quintile)		Low-Dual/LIS (all other) Contracts	
Average Stars (baseline)	**3.73**		**3.49**		**3.78**	
Average Change in Stars	+0.04		+0.14		+0.02	
Contracts Gaining Stars	34	(8%)	20	(26%)	14	(4%)
Contracts with No Change	390	(92%)	57	(74%)	333	(96%)
Contracts Losing Stars	0	(0%)	0	(0%)	0	(0%)
Contracts Rising from <4 to ≥4 stars	23	(5%)	16	(20%)	7	(2%)
Contracts Dropping from ≥4 to <4 stars	0	(0%)	0	(0%)	0	(0%)

The third type of star bonus focused not just on high performance for contracts with a high proportion of beneficiaries with social risk factors, but rather for achieving high performance specifically for those beneficiaries with social risk factors – this can be considered as one example of how an "equity bonus" or "equity measure" might be constructed. First, a weighted average of the ratios of each contract's performance for dual/LIS beneficiaries on each of the 19 clinical measures versus the average performance for dual/LIS beneficiaries across all contracts in the respective clinical measure was created. A bonus of 0.5*(proportion dual/LIS) was applied for all contracts for which this weighted ratio was greater than 1. For example, if a contract had an 80% pass rate for a particular measure for its dual/LIS beneficiaries, when the average was 75% pass rate, that contract would receive a ratio for that measure of 80/75 or 1.07. This 1.07 ratio would be averaged in a weighted fashion (using the weights assigned under the Star Rating scheme) with similarly created ratios for the other 18 measures to create a final ratio. If that ratio is greater than 1, a 0.5*proportion LIS/dual bonus would be applied, such that if a contract had 100% dually-enrolled beneficiaries it would receive the full 0.5 star bonus. If it had 75% dually-enrolled beneficiaries it would receive 0.5*0.75, or 0.44, stars.

The positive feature of this approach is that it explicitly rewards achieving good outcomes in beneficiaries with social risk factors, and puts extra money on the table to incent contracts to do so. As dual beneficiaries tend to be higher-cost, incenting a focus on these beneficiaries may have long-term benefits in terms of efficiency and cost reduction.

This approach would not be budget neutral unless a negative ratio were also applied to reduce Star Ratings for contracts that failed to meet the average performance for the populations of interest, or unless a separate penalty were applied for contracts that do not serve a high proportion of beneficiaries with social risk factors.

When this approach was modeled (Table 8.17) 34% of high dual/LIS contracts gained at least half a star; 12% newly rose to meet the four-star threshold.

Table 8.17: Targeted Star Adjustment for High Performance for Socially At-Risk Beneficiaries

	All Contracts		High-Dual/LIS Contracts (top quintile)		Low-Dual/LIS (all other) Contracts	
Average Stars (baseline)	**3.73**		**3.49**		**3.78**	
Average Change in Stars	+0.07		+0.17		+0.05	
Contracts Gaining Stars	52	(12%)	26	(34%)	26	(7%)
Contracts with No Change	372	(88%)	51	(66%)	321	(93%)
Contracts Losing Stars	0	(0%)	0	(0%)	0	(0%)
Contracts Rising from <4 to ≥4 stars	19	(4%)	9	(12%)	10	(3%)
Contracts Dropping from ≥4 to <4 stars	0	(0%)	0	(0%)	0	(0%)

6. Summary of Policy Options

Each of the policy options presented has strengths and weaknesses, and should be considered in the context of the policy goals outlined in the introductory chapters and the potential for positive impact. A summary of the gains and losses in stars under each option is presented in Tables 8.18a/b. Tables showing the average change in stars under each option and the number of contracts that newly meet or newly drop below the 4 star threshold under each option are provided in Appendix Tables 8.8 and 8.9.

Table 8.18a: Net Impact of Policy Options: Percent of Contracts that Gain at Least Half a Star

	Overall	High-Dual/LIS Contracts (top quintile)	Low-Dual/LIS (all other) Contracts
Direct Adjustment	10%	9%	10%
Categorical Adjustment Index	3%	14%	1%
Stratification	1%	4%	1%
Population Grouping: Measure Rate	4%	15%	1%
Population Grouping: Star Level	8%	36%	2%
Reward Improvement 25%	10%	18%	8%
Targeted Star Adjustment for Achievement	19%	64%	10%
Targeted Star Adjustment for Improvement	8%	26%	4%
Targeted Star Adjustment for Equity	12%	34%	7%

Table 8.18b: Net Impact of Policy Options: Percent of Contracts that Lose at Least Half a Star

	Overall	High-Dual/LIS Contracts (top quintile)	Low-Dual/LIS (all other) Contracts
Direct Adjustment	8%	8%	8%
Categorical Adjustment Index	0.2%	0%	0.3%
Stratification	36%	25%	39%
Population Grouping: Measure Rate	16%	7%	18%
Population Grouping: Star Level	5%	0%	6%
Reward Improvement 25%	8%	8%	8%
Targeted Star Adjustment for Achievement	0%	0%	0%
Targeted Star Adjustment for Improvement	0%	0%	0%
Targeted Star Adjustment for Equity	0%	0%	0%

VII. Key Findings, Strategies, and Considerations

A. Key Findings

Underlying relationships

- Dually-enrolled beneficiaries, beneficiaries living in low-income neighborhoods, Black beneficiaries, rural beneficiaries, and beneficiaries with disabilities experienced worse outcomes compared to other beneficiaries on many to most of the quality metrics included in the Medicare Advantage Quality Star Rating program. These differences were small to moderate in size, and largely driven by patient rather than contract factors. Hispanic beneficiaries had better outcomes on most measures.

Program Impact

- Contracts with a high proportion of beneficiaries with social risk factors generally did worse on overall quality scores, and were much less likely to receive quality bonus payments. However, a small number of contracts serving predominantly dually-enrolled / low-income subsidy-enrolled beneficiaries performed well on the quality measures overall.

Policy simulations

- Adjusting for social risk at the measure level, either directly or using an index, led to small changes in performance scores for contracts overall, though there were small gains in high-dual contracts. These small changes were the result of two factors: first, the differences in performance between dually-enrolled beneficiaries and non-dually-enrolled beneficiaries are small to moderate in size, so for some measures adjustment makes little difference in scores; second, only the patient-level clinical measures were adjusted, and no adjustments were applied to any of the patient experience or contract-level measures.
- Upweighting the improvement measures had a limited impact.

- Stratifying contracts by proportion dual led to changes in Star Ratings; using population grouping to stratify within contracts also led to changes in Star Ratings.
- Providing star adjustments for improvement or achievement in beneficiaries with social risk factors, or for equity, led to changes in Star Ratings.

B. Strategies and Considerations

Strategies and considerations are outlined below. They are, as in all program chapters in this report, organized into three broad strategies that best meet the policy criteria outlined in Chapter 1. 1) Measure and report quality for beneficiaries with social risk factors; 2) Set high, fair standards for all beneficiaries; and 3) Reward and Support Better Outcomes for Beneficiaries with Social Risk Factors.

STRATEGY 1: Measure and Report Quality for Beneficiaries with Social Risk Factors

Measurement and reporting are foundational for quality improvement in health care.

CONSIDERATION 1: Consider enhancing data collection and developing statistical techniques to allow measurement and reporting of performance for beneficiaries with social risk factors, or for subgroups of plans (e.g., special needs plans) on key quality and resource use measures.

The ability to measure and track quality, outcomes, and costs for beneficiaries with social risk factors over time is crucial as providers seek to reduce disparities and improve care for these groups to the greatest degree possible.

Current data collection in the MA program is not optimally structured for data collection on beneficiaries with social risk factors. Specifically, the ability of CMS to adequately evaluate performance for subgroups on many of the measures in the program is limited by small sample size and non-targeted sampling. For example, the average contract in 2014 had over 31,000 beneficiaries spread across 3-5 plans; average dual enrollment per contract was roughly 9,000, though many contracts had fewer than 100 dually-enrolled beneficiaries. However, many HEDIS measures are required to be collected on only 411 beneficiaries due to the need for medical record review, which may or may not be representative of any plan benefit package or subgroup. The measure specifications do not allow adequate differentiation of quality at the beneficiary type or plan level. These limitations mean that presently there is limited ability to track disparities in care by plan, or to ensure that any contract's reported quality applies to dual beneficiaries, or to racial or ethnic minorities.

In addition, to the degree that beneficiaries are split across not only different plans but also different plan types (particularly SNPs), the current strategy does not allow for the fullest assessment or incentivization of quality for these plans, which often serve beneficiaries with social risk factors. There are a small number of SNP-only measures, but these do not measure the full spectrum of quality and outcomes. Given improvements in data collection and management over the past years, expanding data collection could improve the MA program's ability to directly incent improvements in care in SNPs and reductions in disparities overall. However, this would likely require additional resources.

Expanding data collection and moving as feasible towards measures that are less resource-intensive to

collect, such as those in electronic health records or existing registries, would allow for better evaluation of subpopulations on the quality, outcomes, and costs of care delivered and a higher likelihood of reducing disparities in care without a significant expansion of the reporting burden for contracts. In terms of provider reporting burden, combining data collection for MA quality measures with the measures collected under the Physician VM program, or its successor, the Merit-Based Incentive Payment System (MIPS), could increase efficiency and reduce reporting burden, and should be pursued where helpful.

When adequate data are available, key quality and resource use measures stratified by social risk should be developed and considered for contract feedback and/or public reporting, so that contracts, policymakers, and consumers can see and address important disparities in care. While not all measures may lend themselves to reporting by subgroup, a key subset of measures should be pursued for subgroup reporting at the contract level.

CONSIDERATION 2: Measure developers should develop measures that are meaningful for Medicare beneficiaries with disabilities, where many current measures do not apply.

Many of the quality measures do not apply to the under-65 population at all, and thus this group is particularly prone to under-representation in quality assessment. Given findings here and in prior reports that disability is a powerful driver of quality and outcomes both independently and within the context of dual enrollment,[2] beneficiaries who are both dually enrolled and have a disability should be a particular focus of any such plan to focus improvement efforts on particular populations.

CONSIDERATION 3: Consider developing and introducing a new measure or domain on Achieving Health Equity into the MA program to assess and reward health plan efforts to reduce health disparities.

As outlined in Chapter 4, the report from the National Academies of Sciences, Engineering, and Medicine performed under the IMPACT body of work supported the prioritization of equity as a key strategy in delivering high-quality care to beneficiaries with social risk factors.[12] A new measure or domain for health equity should be created, to explicitly incent contracts to focus on achieving more equal outcomes for dually enrolled beneficiaries and/or beneficiaries with disabilities in comparison to their peers. This is not feasible in the short term, as measures applicable to this domain do not currently exist, but such measures should be developed as part of the Department's strategy to ensure that value-based purchasing programs do not inadvertently worsen disparities in care and outcomes. This has also been suggested elsewhere in this report and by stakeholders, and may apply to other settings, and represents an important means for both tracking and reducing disparities in health outcomes.

CONSIDERATION 4: Prospectively monitor the financial impact of the MA program (magnitude of bonuses, etc.) on providers disproportionately serving beneficiaries with social risk factors.

As the Medicare Advantage program continues to change, prospectively monitoring the program's financial impact on providers disproportionately serving beneficiaries with social risk factors is critical. This is important both for SNPs and for other plans that serve high proportions of beneficiaries with social risk factors.

STRATEGY 2: Set High, Fair Standards for All Beneficiaries

Given the overarching goal of improving care for all beneficiaries, providers should be held to high, fair standards regardless of the beneficiaries they serve.

CONSIDERATION 1: A temporary adjustment index by contracts' dual and disability makeup should be used in the short term, as outlined in the 2017 Rate Announcement and Call Letter. The measures used in the current MA program should continue to be examined to determine if adjustment for social risk factors is appropriate.

CMS recently finalized an interim analytical adjustment to Star Ratings for FY 2017 using a version of the adjustment index modeled above. This index does not adjust the measures themselves, and instead provides a targeted adjustment to contracts with a high proportion of dually enrolled and/or disabled beneficiaries. In terms of the policy criteria, a pro for this index is that it adjusts fairly narrowly in an effort to limit the adjustment to only what is related directly to the social risk factor and only to what is beyond provider control. It also does not adjust the measures themselves, so it preserves transparency. Overall, an adjustment index is a reasonable strategy given these policy criteria.

It is also worth noting that the accuracy of performance measurement should not be conflated with the accuracy or adequacy of payment. Entirely separately from the adjustment index described above, the MA risk adjustment methodology for FY 2017 also addressed an under-prediction of costs for full dually-enrolled beneficiaries and thus provides a higher payment adjustment for full-dual enrollees. This will likely provide significant financial support to high-dual/LIS contracts, but is not a payment for the higher administrative burden for serving beneficiaries with social risk factors nor intended to address any issues around quality measurement or reward.

Contract-level stratification, depending on how operationalized, has the potential to provide greater protection from financial stress for contracts, but stratification risks over-adjusting for factors that are not directly related to dual enrollment, such as the provision of poor quality care, and for factors that are within providers' control, such as bias. Therefore this is not recommended.

Stratifying at the plan level, for example to compare only D-SNPs with D-SNPs, is not currently feasible given data limitations, but may be a promising long-term strategy because it would provide more equitable opportunities to achieve Quality Bonus Payments while also allowing a direct focus on improving care for special populations. This approach might help make disparities more visible, and

ultimately more addressable, by separating the performance of plans that serve beneficiaries with social risk factors out from the larger contract context where they can currently be difficult to assess.

However, there are two major limitations to this strategy: first, there are sample size issues with the measures currently included in the program that would make it impractical to apply to SNPs, or to plan-level analyses in general. This would need to be addressed by using different measures – for example, ones currently used in the Physician VM program (Chapter 10) with much lower sample size requirements – or by developing new measures for this setting. The second major issue is that focusing on D-SNPs would not provide any financial protection for contracts that enroll a high proportion of dually-enrolled beneficiaries but do not provide D-SNPs. Requiring dually-enrolled beneficiaries to enroll in D-SNPs would not be a reasonable policy, since this could limit access and create a two-tiered system. Therefore, plan-level stratification is not currently recommended.

Stratifying at the beneficiary level would make disparities more visible, and has the potential to be a fairer approach for some measures, but applying this strategy broadly could risk over-adjusting for factors under providers' control, and data limitations currently preclude its use. Therefore, it is not currently recommended.

The improvement options examined would potentially reduce financial stress, but would not be budget-neutral, and in and of themselves do not incent a reduction in disparities. They may make transparency more difficult. Therefore, upweighting improvement above its current weight is not currently recommended.

Based on the available evidence and policy criteria, a short-term adjustment index is a reasonable strategy for accounting for social risk. Longer-term changes that would improve the fairness and accuracy of quality measurement in the MA program and incent higher quality care for beneficiaries with social risk factors require strategies beyond simply accounting for social risk and are covered in the considerations that follow.

CONSIDERATION 2: Program measures should be studied to determine whether differences in health status might underlie the observed relationships between social risk and performance, and whether better adjustment for health status might improve the ability to differentiate true differences in performance between providers.

The MA program includes a number of measures across many different domains. Some of these measures, particularly the clinical outcome measures, may be more robust if they are updated to include additional measures of medical and related risk (such as multimorbidity, functional status, disability, etc.). Targeted exclusions may be appropriate in some cases, where high levels of complexity preclude fair comparison between beneficiaries and providers. In particular, outcome and intermediate outcome measures are likely sensitive to differences in patient populations – for example, it is typically

much more difficult to control diabetes in the presence of other chronic illnesses, such as kidney disease, liver disease, or heart disease, than in the absence of such factors. Processes to examine these measures are ongoing via the National Quality Forum (NQF) and others. Making these measures more robust could decrease the measured effect of dual enrollment on outcomes under quality measures, given that prior evidence suggests some of the effect of being dually-enrolled on these measures is mediated through higher levels of medical complexity and/or worse functional status.

Better accounting for medical risk would meet many policy criteria because it would adjust for factors that are directly related to outcomes and for factors that are outside contracts' control, and promote transparency. In many ways, improved accounting of medical risk and complexity is an ideal policy solution, but it is difficult and time-consuming, and will require a concerted effort not only from the Department but from stakeholders more broadly.

STRATEGY 3: Reward and Support Better Outcomes for Beneficiaries with Social Risk Factors

One of the key findings in this chapter was the wide distribution of performance among contracts serving high-social-risk populations. This suggests that achieving better outcomes for these groups is feasible. However, in many cases it may require more effort on the part of contracts, or more resources and more support, than achieving the same outcomes in a lower-risk population.

CONSIDERATION 1: Consider providing targeted star adjustments to reward contracts that achieve high quality or improve significantly for dually-enrolled beneficiaries.

The adjustment index outlined above is an example of the type of targeted adjustment that preserves transparency while recognizing that it may be more difficult to achieve high quality and good outcomes in beneficiaries with social risk factors. In the long term, alternative versions of such a targeted adjustment could be considered. For example, targeted star adjustment could be created to reward providers that achieve good outcomes in socially high-risk populations, or that improve significantly, as modeled above. Targeted adjustments could be applied differentially to different types of measures groups or domains, such as processes versus outcomes. This would be particularly beneficial under the policy criteria of reducing disparities and protecting contracts from undue financial stress. While this option is not budget-neutral, it has the potential to be efficient in the long run if it improves quality and outcomes for these typically high-need groups. Money to reward contracts that perform particularly well for beneficiaries with social risk factors could be reallocated from current Quality Bonus Payments by moving to a scaled Quality Bonus Payment system rather than an all-or-nothing 5% bonus at the 4-star threshold, which may have additional value in terms of the behavioral economics of incenting contracts to continually improve.

CONSIDERATION 2: Consider using existing or new quality improvement programs to provide targeted technical assistance to contracts serving a high proportion of beneficiaries who are dually-enrolled or

who have disabilities.

Performance for some social risk groups on many quality measures is lower than other subgroups, indicating that new strategies and programs may be needed to ensure that disparities can be reduced or eliminated; the MA program can be a driver for this type of innovation. New or existing quality improvement programs could be used to provide targeted assistance to contracts or plans serving beneficiaries with social risk factors.

CONSIDERATION 3: Consider requiring that contracts serving dually-enrolled beneficiaries coordinate benefits between Medicare and Medicaid; barriers to integration of services between the two payers as well as barriers to spending flexibility for supplemental benefits for dually-enrolled beneficiaries should be minimized where feasible.

Specific groups of contracts, in particular those that fully integrate benefits between Medicare and Medicaid, have had particular success in treating dually-enrolled beneficiaries. As mentioned in the report from the National Academies of Sciences, Engineering, and Medicine conducted for IMPACT, The United States Government Accountability Office (GAO) reported that the fully-integrated dually-enrolled special needs plans (FIDE-SNPs) have better performance than that seen in the other D-SNPs: though the overall numbers were small, GAO reported that 14 (56 percent) of the 25 FIDE-SNPs met criteria for high quality but only 24 (14 percent) of all other 169 D-SNPs met these criteria.[13] However, despite higher quality, clinical outcomes and costs were not better in these SNPs, suggesting coodinating benefits may be necessary but not sufficient to achieve good outcomes. These patterns were less consistent for contracts with a high proportion of dual-disabled individuals,[14] suggesting as mentioned above that more attention in terms of measuring and improving quality might be particularly warranted in this highly socially at-risk group.

However, given this success, and the importance of highly coordinated and wrap-around care for beneficiaries at socially at-risk, contracts that serve dually-enrolled beneficiaries should coordinate benefits for these beneficiaries to the fullest degree possible. MedPAC has recommended this previously, stating “Congress should permanently reauthorize dual-eligible special needs plans (D–SNPs) that assume clinical and financial responsibility for Medicare and Medicaid benefits and allow the authority for all other D–SNPs to expire.”[15]

CONSIDERATION 4: Consider developing demonstrations or models focusing on care innovations that may help achieve better outcomes for beneficiaries with social risk factors.

In the MA setting, there are many promising demonstrations and models currently in place that have the potential to discover care innovations for beneficiaries with social risk factors that could be scaled. The strategies learned from ongoing demonstration projects and/or from successful contracts that may help optimally treat beneficiaries with social risk factors should be disseminated where feasible.

For example, strategies suggested by the National Academies of Sciences, Engineering, and Medicine, including the importance of care coordination, the use of comprehensive needs assessments, formation of collaborative partnerships with community organizations and home and community-based services providers, providing care continuity across settings, and engaging beneficiaries in their care, are being tested in demonstration programs currently. Where successful, lessons learned from these programs should be shared more broadly.

CONSIDERATION 5: Consider further research to examine the costs of caring for beneficiaries with social risk factors to determine whether current payments adequately account for differences in care needs.

One final piece of information that could be critical for policy recommendations in the future would be to understand more about the true costs of achieving good outcomes for beneficiaries with social risk factors. As noted above, the current payment adjustments for these groups are based on their levels of spending on medical care – for example, appointments, hospitalizations, and medications. However, some contracts argue that the administrative costs of achieving good outcomes in these groups are high, and not taken into account.

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CHAPTER 9: The Medicare Shared Savings Program

In This Chapter:

- ***Is there a relationship between beneficiary social risk and performance on the cost and quality measures that comprise the Medicare Shared Savings Program?***
- ***Is there a relationship between Accountable Care Organization (ACO) social risk profile and performance on the cost and quality measures that comprise the program?***
- ***Are ACOs that serve a high proportion of beneficiaries with social risk factors less likely to share in savings under the Medicare Shared Savings Program?***
- ***How would potential policy options to address issues of social risk and performance in the Medicare Shared Savings Program affect shared savings?***

This chapter presents findings on the relationship between beneficiary or ACO social risk and performance under the Medicare Shared Savings Program, and examines policy options.

Key Findings:

Underlying Relationships

- Dually-enrolled and Black beneficiaries, as well as beneficiaries with disabilities, were more likely to be readmitted, even after controlling for differences in patient risk. These disparities were very similar to those found in the HRRP analyses (Chapter 5), though the raw readmission rates in ACO beneficiaries in general were lower than those seen in the overall FFS population.
- Within the same ACO, dually-enrolled, Black, and Hispanic, beneficiaries, as well as beneficiaries with disabilities and those from low-income ZCTAs, had greater odds of being admitted for COPD (but not for HF) than other beneficiaries, even after risk-adjustment.
- Beneficiary-level factors were generally a larger contributor to readmission rates than ACO-level factors. Beneficiaries in high-dual, high-disabled, and high-Black ACOs were more likely to have preventable admissions for COPD, even once patient clinical risk was taken into consideration.

Cost and Quality Performance among ACOs Serving Socially at-risk Populations

- ACOs in the highest quintile of the proportion of beneficiaries with social risk factors served had comparable scores on the majority of quality measures to ACOs serving an average population.
- ACOs in the highest quintile of the proportion of beneficiaries with social risk factors served had, on average, higher cost benchmarks than ACOs serving an average population.
- In general, ACOs serving beneficiaries with social risk factors had greater savings and were more likely to share in savings relative to ACOs overall.

Policy Simulations

- Providing a bonus for ACOs that served a high-dual population increased per-beneficiary savings.
- Moving to a regional benchmark was associated with higher absolute savings for high-dual ACOs but created a disparity between these and other ACOs in achieving shared savings.

Strategies and Considerations for the Medicare Shared Savings Program

SUMMARY OF STRATEGIES AND CONSIDERATIONS
STRATEGY 1: Measure and Report Quality for Beneficiaries with Social Risk Factors
CONSIDERATION 1: Consider enhancing data collection and developing statistical techniques to allow measurement and reporting of performance for beneficiaries with social risk factors on key quality and resource use measures.
CONSIDERATION 2: Measure developers should develop key quality and resource use measures and/or statistical approaches suitable for reporting of performance for beneficiaries with social risk factors.
CONSIDERATION 3: When feasible, consider developing and introducing a new measure or domain on Achieving Health Equity to the Medicare Shared Savings Program to assess and reward ACO efforts to reduce health disparities.
CONSIDERATION 4: Prospectively monitor costs and savings for ACOs disproportionately serving high proportions of dually-enrolled beneficiaries as the benchmark rebasing methodology that accounts for factors based on FFS spending in the ACO's regional service area takes effect.
STRATEGY 2: Set High, Fair Standards for All Beneficiaries
CONSIDERATION 1: The measures used in the Medicare Shared Savings Program should continue to be examined to determine if adjustment for social risk factors is appropriate.
CONSIDERATION 2: Ambulatory care-sensitive condition admission measures should account for medical risk, as CMS has announced will be done in future program years (see 2017 PFS final rule, published November 2016).
CONSIDERATION 3: Program measures should be studied to determine whether differences in health status might underlie the observed relationships between social risk and performance, and whether better adjustment for health status might improve the ability to differentiate true differences in performance between providers. Attention should also be given to developing quality and outcome measures specifically designed for the ACO setting.
STRATEGY 3: Reward and Support Better Outcomes for Beneficiaries with Social Risk Factors
CONSIDERATION 1: Consider providing additional financial incentives to reward ACOs that achieve high quality or significant improvement specifically among their beneficiaries with social risk factors.
CONSIDERATION 2: Consider providing targeted technical assistance to ACOs that disproportionately serve beneficiaries with social risk factors to help improve quality.
CONSIDERATION 3: Consider developing demonstrations or models focusing on care innovations that may help achieve better outcomes for beneficiaries with social risk factors in ACOs.
CONSIDERATION 4: Consider further research to examine the costs of caring for beneficiaries with social risk factors.

I. Introduction

A. Background

The Medicare Shared Savings Program was established by section 3022 of the Affordable Care Act (ACA) and is a key component of the ACA's delivery system reform initiatives. A voluntary program available to accountable care organizations (ACOs), the Medicare Shared Savings Program uses financial incentives tied to quality metrics and savings with the goal of increasing coordination of care and reducing unnecessary costs for Medicare beneficiaries. ACOs are groups of providers and suppliers that have agreed to be accountable for the care of a defined population of Medicare fee-for-service (FFS) beneficiaries and have at least 5,000 assigned Medicare beneficiaries for each benchmark and performance year.[1]

The first group of ACOs entered the program in 2012 with agreement start dates of April 1 and July 1. Additional ACOs have entered into 3-year agreements to participate in the program, with agreement periods beginning January 1 of each year. A typical performance year corresponds to the calendar year (January 1 – December 31), however, in the case of April and July 2012 starters, the first performance year was 21 months and 18 months respectively (concluding December 31, 2013). Their second PY ran from January 1, 2014 through December 31, 2014, and their third PY from January 1, 2015 through-December 31, 2015. There is an annual application for providers to join the Medicare Shared Savings Program and new start dates on January 1 of each year. The second, third, and fourth groups of ACOs entered the Medicare Shared Savings Program on January 1 of 2014, 2015, and 2016, respectively. As of April 2016, there were over 430 ACOs participating in the Medicare Shared Savings Program, with over 7.7 million assigned beneficiaries.[2]

Under the Medicare Shared Savings Program, ACOs can choose one of three payment model "tracks." Under Track 1, the ACO faces only "upside" risk: ACOs are eligible to share in any savings they achieve if they have savings above the minimum savings rate (MSR), but do not share in losses. Under Tracks 2 and 3, the ACO faces two-sided risk and is eligible for sharing both savings as well as losses. (Note Track 3 was added with the June 2015 final rule (Medicare Shared Savings Program; Accountable Care Organizations Final Rule (80 FR 32692) (June 2015 final rule)) and became available to ACOs with agreement start dates of 2016 and subsequent years. Since Track 3 ACOs are not included in these analyses, details specific to Track 3, which is based on prospective beneficiary assignment rather than retrospective beneficiary assignment as under Tracks 1 and 2, have been omitted.) To date, the vast majority of participating ACOs (95%) are in Track 1. Five Track 2 ACOs with 2012 and 2013 start dates were reconciled for the performance year ending 12/31/2013, and by the conclusion of performance year 2014 3 ACOs remained in Track 2. As of April, 2016, 6 ACOs were in Track 2 and 16 were in Track 3.

The sample for analysis in this chapter consists of ACOs that entered the Medicare Shared Savings Program in 2012, 2013, and 2014 (n=333) and data from PY 2014 are used in primary analyses presented here. Further, the program design details (e.g., number of performance measures) and rules described in this chapter reflect those in place during 2012-14, except where noted otherwise; some of these rules

have changed in the years since and thus the rules described in this chapter do not always reflect the current program.

Payment under the Medicare Shared Savings Program

Under Tracks 1 and 2 in the first two PYs of the Shared Savings Program, payments were determined in four steps: (1) assignment of beneficiaries to ACOs for each of 3 benchmark years (historical costs), and annually for each performance year, (2) calculation of an expenditures benchmark and determination of the updated benchmark annually, (3) savings or losses determined by comparing actual expenditures for performance year assigned beneficiaries to benchmark expenditures, accounting for the ACO's quality performance and other requirements of the program's financial models, and (4) once savings/losses are calculated, the sharing/loss rate (e.g., how much of their savings the ACO keeps) is determined by the ACO's quality score.

Beneficiary Assignment

Under Track 1 and 2 in the first two PYs of the Medicare Shared Savings Program, Medicare FFS beneficiaries were assigned retrospectively to an ACO based on receiving a plurality of primary care services from primary care providers within the ACOs (measured in allowed charges). Eligible beneficiary must have had at least one month of Part A and B enrollment and have received at least one primary care service with an ACO physician. According to the requirements established with the November 2011 final rule (Medicare Shared Savings Program: Accountable Care Organizations Final Rule (76 FR 67802) (November 2011 final rule)), beneficiaries who had no primary care services from a primary care physician were assigned to the ACO based on the plurality of primary care services furnished by certain other ACO professionals. Before the start of each PY, the ACO received a preliminary list of prospectively assigned beneficiaries for planning purposes, based on the most recent 12 months of claims, and this preliminary prospective assignment list is updated quarterly.

Calculation of an Expenditures Benchmark

To determine whether the ACO saved money, a benchmark must be established at the start of each agreement period (three-year contract). Under the program rules governing PY 2012, 2013, and 2014, an ACO's benchmark for its first agreement period was calculated based on three years of historical FFS spending for four groups of beneficiaries who would have been assigned to the ACO: those with End-Stage Renal Disease (ESRD), those who are disabled, the aged population who are dually eligible for Medicaid, and the aged population who are not dually eligible. The first two years of data, (the first two benchmark years (BY), BY1 and BY2) were trended forward to BY3 dollars using the national growth rate for FFS expenditures in Medicare Parts A and B with each year weighted equally. The benchmarks for each beneficiary population were risk-adjusted using the CMS Hierarchical Condition Categories (HCC) model and were updated each year of the agreement period. The fact that the cost benchmark was risk-adjusted is relevant when assessing the relationship between social risk and ACO performance.

In accordance with the Final Rule issued by CMS on June 6, 2016 (81 Fed. Reg. 37950), the process of resetting (or rebasing) an ACO's benchmark will change for second or subsequent agreement periods on

or after January 1, 2017. Changes in the benchmark methodology used to rebase and update the ACO's benchmark aim to make the ACO cost target less dependent on historical expenditures and more reflective of FFS spending in its region. In turn, these changes aim to improve incentives for ACOs to generate cost savings and increase retention and participation among high-performing ACOs located in areas with high underlying cost growth. Under the new methodology, each ACO's benchmark would reflect both its own historical spending and the difference between its own spending and spending levels in the ACO's region (see June 2016 Final Rule for additional details).[3]

Determination of Savings and Losses and the Role of Quality Scoring in PY14

The process for determining shared savings under track 1 during the first two performance years of program implementation is shown in Figure 9.1. ACOs were eligible to share in their savings if their actual spending was below their benchmark and their savings met or exceeded a minimum savings rate (MSR) which was a percentage of the ACO's updated benchmark. The MSR varied based on ACO size (2-3.9%, with small ACOs having higher MSRs due to uncertainty). The percentage of savings an ACO was eligible to keep was based on its quality score as described below, assuming the ACO met a minimum quality threshold. The maximum sharing rate an ACO could achieve was 50% under track 1 and 60% under track 2. The actual sharing rate was determined based on an ACO's quality score (actual sharing rate = quality score × maximum sharing rate).

For the performance and program years covered in this analysis, ACOs' quality scores were based on performance on 33 quality measures across four domains: patient/caregiver experience, care coordination/patient safety, preventive health, and at-risk populations. For a full list of quality measures, please see the Appendix to this chapter. In the first year of an ACO's 3-year agreement period (PY1 for each ACO), quality was judged on a "pay-for-reporting" basis, under which ACOs were eligible for shared savings if they report accurately on 100% of measures, regardless of actual performance on quality measures. For ACOs in their second performance year in 2014, 25 of the 33 measures were based on actual performance (with the remaining eight based on reporting), and in PY3, 32 measures were based on performance with one measure (health status/functional status) based on reporting only. There are additional changes to future program years, but those are not covered here.

For each pay for reporting measure, ACOs received 2 points. A sliding scale was used to determine an ACO's points for each pay for performance measure, and measure-specific performance benchmarks were published prior to each performance year. For a performance level below the 30th percentile of FFS data, the ACO received no points, and for performance at or above the 90th percentile of FFS data, a maximum of two points (with the exception of the electronic health record measure, which is double-weighted to signal its importance). For the full sliding scale applied in the 2014 performance year (aligned with the results shown in this chapter), please see the Appendix to this chapter. A domain score, the percent of total points available for the domain that the ACO earned, was calculated for each domain and then the domain scores were averaged to get the final quality score.

The process of achieving shared savings is summarized in Figure 9.1:

Figure 9.1: Determination of shared savings in the Medicare Shared Savings Program, track 1

B. Existing Research on Social Risk Differences in the Medicare Shared Savings Program

As the Medicare Shared Savings Program is a relatively new program, there is little prior research examining the relationship between social risk and performance in this setting. One study suggested that the Medicare Shared Savings Program population as a whole might not be representative of Medicare beneficiaries at high social-risk, finding in the first year of the Medicare Shared Savings Program that ACO beneficiaries tended to be older and higher-income while non-ACO beneficiaries were more likely to be Black, dually-enrolled, and disabled.[4]

Studies of commercial (non-Medicare Shared Savings Program) ACOs have also demonstrated minimal improvements in quality and slightly lower costs, particularly in beneficiaries at high medical risk, but social risk was not examined independently.[5] Further, commercial ACOs may differ from Medicare ACOs in important ways.

In terms of spending, research on a precursor to ACOs, the Physician Group Practice Demonstration, demonstrated that savings, when achieved, were concentrated among dually-enrolled beneficiaries.[6] A study of large provider groups demonstrated that group size and quality were not consistently associated with lower racial disparities in care.[7] Other research on disparities between beneficiaries with social risk factors and their peers on outpatient and inpatient quality measures, many of which are included in the Medicare Shared Savings Program as well as other CMS programs, is outlined in the other chapters (for example, readmissions in Chapter 5, outpatient quality measures in Chapter 8).

C. Limitations

Most critically, as outlined in the introductory chapters, the analyses in this Chapter, as throughout the report, can only provide associations and not causality or mechanism. While conducting analyses that focus on the within-ACO differences between dually-enrolled and non-dually-enrolled beneficiaries help to isolate the effect of the beneficiary characteristics, these analyses cannot control for the possibility

that dually-enrolled beneficiaries may see lower-quality clinicians within the organization, or may face bias or discrimination. The analyses can also not determine whether any of these within-ACO effects are related to differential access to care outside the ACO in question. Similarly to the other settings examined in this report, the definitions of social risk in this chapter are limited to those currently available in Medicare data. These data limitations leave open the possibility of other equally or more important social risk factors that are not addressed here.

One data-related caveat specific to this Chapter is that the Medicare Shared Savings Program defines dual enrollment slightly differently than some other programs (the Medicare Shared Savings Program does not include categories 03 (Specified Low-Income Medicare Beneficiary (SLMB)-only), 05 (Qualified Disabled Working Individual (QDWI)), 06 (Qualifying Individuals (QI), or 09 (Other dual eligible, but without Medicaid coverage) in its count of dually-enrolled beneficiaries,[8] whereas in some other programs and throughout this Report all are included in the dually-enrolled category).

Additionally, data are limited in terms of beneficiary-level quality measures captured in claims data; ACOs submit most quality measures on a sample of beneficiaries through a web interface and therefore many of the metrics are not available for all beneficiaries. Thus, patient-level analyses in this chapter are limited to a small subset of metrics, including readmissions and ambulatory care-sensitive condition admissions.

Finally, this Report focuses on historical performance; as past performance may not always predict future performance, the policy simulations should be interpreted as estimates, particularly in light of the ongoing program improvements through rulemaking.

D. Framework for the Chapter: Analytic Findings, Policy Simulations, Strategies, and Considerations

The remainder of this chapter is structured as follows. First, it describes underlying relationships between social risk and performance on the quality measures established for the Medicare Shared Savings Program. Next, it examines the performance of ACOs serving a high proportion of beneficiaries with social risk factors on these measures, and then the performance of these ACOs under the Medicare Shared Savings Program shared savings calculations. Finally, it outlines and simulates a set of potential policy options (and planned future program changes) related to adjustment for social risk, differentially rewarding improvement, and moving to regional benchmarking. Finally, strategies and considerations for the Medicare Shared Savings Program are presented, using the strategic framework outlined in Chapter 1: 1) measure and report quality for beneficiaries with social risk factors; 2) set high, fair standards for all beneficiaries; and 3) reward and support better outcomes for beneficiaries with social risk factors. These three strategies build on each other to address social risk in Medicare payment programs.

II. Beneficiary and Provider Characteristics

A. Patient Characteristics

In total, there were 5.3 million beneficiaries assigned to ACOs participating in the Medicare Shared Savings Program in 2014. Of these beneficiaries, 21.6% were partially or fully dual-enrolled (5.4% partial and 16.2% full dual), and over 25% originally qualified for Medicare on the basis of a disability. The ACO

population was less often dually-enrolled, qualified for Medicare based on a disability, or rural, than the overall Medicare FFS population (Table 9.1a).

Table 9.1a: Patient Characteristics, ACO vs. Non-ACO (2014)

	Medicare FFS, non-ACO	All Medicare Shared Savings Program ACOs
Total Beneficiaries	27,574,226	5,322,292
Female	45.2%	42.7%
Mean Age	70.5	71.5
Dually-enrolled	21.6%	17.2%
Originally qualified for Medicare based on a disability	26.2%	21.4%
White	78.7%	78.4%
Rural (Non-MSA)	25.1%	15.2%

Within ACOs, beneficiaries with social risk factors were more likely to have other social risk factors, as well as to have higher levels of medical risk as measured by comorbidities (Table 9.1b):

Table 9.1b: Patient Characteristics, Beneficiary Social Risk Groups within ACOs (2014)

	Dually-enrolled	Disability	Black	Hispanic	Low-ZCTA Income	Rural
Total Beneficiaries	704,209	785,582	860,255	717,860	667,322	1,085,654
Female	42.7%	43.3%	42.1%	42.4%	42.8%	43.4%
Mean Age	69.7	68.6	70.0	70.9	70.3	70.8
Dually-enrolled	40.7%	29.6%	22.8%	29.7%	24.1%	20.7%
Disability	31.2%	34.3%	27.3%	24.1%	28.9%	25.6%
White	61.9%	72.2%	64.1%	55.8%	74.5%	86.1%
Black	11.5%	12.5%	23.4%	10.5%	10.4%	5.6%
Hispanic	5.2%	5.2%	5.2%	5.2%	5.2%	5.2%
Other Race	13.4%	7.1%	7.4%	12.2%	5.4%	5.8%
Rural (Non-MSA)	22.2%	22.1%	12.2%	5.8%	32.7%	48.7%
HCC=hierarchical condition category; MSA=metropolitan statistical area; ZCTA=ZIP code tabulation area						

Table 9.1b continued: Patient Characteristics, Beneficiary Social Risk Groups within ACOs (2014)

	Dually-enrolled	Disability	Black	Hispanic	Low-ZCTA Income	Rural
ZCTA Level Income						
Unknown	0.2%	0.1%	0.1%	0.1%	0.1%	0.1%
0 - <20k	24.8%	26.0%	17.8%	19.7%	36.0%	17.4%
20 - <25k	27.4%	29.7%	23.7%	22.6%	39.7%	33.2%
25k - <30k	20.7%	21.9%	19.1%	16.9%	15.6%	27.3%
30k - <40k	20.0%	18.1%	26.0%	24.2%	7.8%	18.6%
≥40k	7.0%	4.3%	13.3%	16.4%	0.8%	3.5%
HCC Comorbidity (# of HCCs in 2014)						
0 HCCs	32.4%	33.7%	33.3%	32.2%	33.2%	35.9%
1 HCC	23.3%	23.8%	23.8%	22.7%	23.9%	24.7%
2 HCCs	16.3%	16.2%	16.1%	16.2%	16.2%	15.7%
3 - 5 HCCs	20.6%	19.7%	19.8%	21.2%	20.1%	18.1%
6 - 9 HCCs	6.1%	5.6%	5.8%	6.3%	5.6%	4.8%
10+ HCCs	1.3%	1.1%	1.2%	1.4%	1.0%	0.8%
HCC=hierarchical condition category; ZCTA=ZIP code tabulation area						

B. Provider Characteristics

There were 333 ACOs participating in Medicare Shared Savings Program in performance year 2014. Only three of these ACOs participated in Medicare Shared Savings Program Track 2, with the remainder in Track 1 (up-side only risk). Of these 333, 111 started in Medicare Shared Savings Program in 2012, 103 started in 2013, and 119 in 2014. Overall, the average number of beneficiaries served by each of the ACOs was 15,983. Close to half of these ACOs (45%) served fewer than 10,000 beneficiaries and only about one in five had more than 20,000 enrollees. Over half of participating ACOs (57%) had a participating hospital (Table 9.2).

ACOs in the highest quintile of each group of beneficiaries with social risk factors tended to be smaller and to have patient populations that had higher levels of many social risk factors:

Table 9.2: Medicare Shared Savings Program ACO Characteristics, by Proportion of Socially At-Risk Beneficiaries (2014)

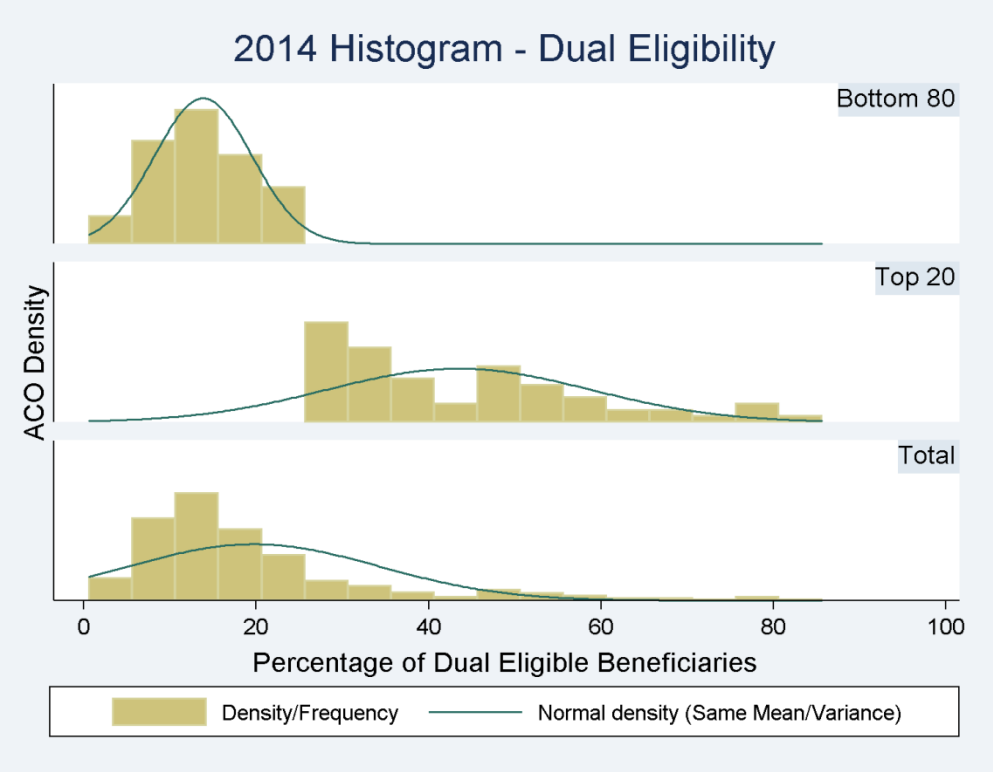
	All ACOs*	High-Dual	High-Disabled	High-Black	High-Hispanic	Low-ZCTA-Income	High-Rural
Number of ACOs	333	66	66	66	66	66	66
Average Beneficiaries	15,983	10,670	11,903	13,034	10,877	10,111	16,449
Size (enrollees)							
Small (0-10,000)	45%	67%	55%	56%	71%	73%	47%
Med (10,001-20,000)	33%	24%	30%	29%	18%	20%	27%
Large (20,000+)	22%	9%	15%	15%	11%	8%	26%
Size (providers)							
Small (0-99)	33%	38%	26%	38%	44%	58%	35%
Medium (100-500)	38%	33%	32%	29%	33%	27%	36%
Large (501+)	30%	29%	42%	33%	23%	15%	29%
Hospital in Network	57%	68%	76%	52%	55%	52%	71%
Patients Served							
% Dually-enrolled	17%	41%	30%	23%	30%	24%	21%
% Qualified for Medicare based on a disability	21%	31%	34%	27%	24%	29%	26%
% Black	8%	11%	13%	23%	11%	10%	6%
% Hispanic	5%	13%	8%	5%	22%	10%	2%
% Low Income ZCTA	12%	25%	26%	18%	20%	36%	17%
% Rural	15%	22%	22%	12%	6%	33%	49%

ZCTA=ZIP code tabulation area

*=refers to all ACOs in the Medicare Shared Savings Program only.

While overall 17% of ACO beneficiaries were dually enrolled, the average ACO in the "high-dual ACO" group, defined as the top quintile of the percent of dually-enrolled beneficiaries in the ACO, had 41% dually-enrolled beneficiaries. Beneficiaries in high-dual ACOs were also more likely to be Black, Hispanic, rural, and disabled. These beneficiaries were also relatively poorer in terms of ZCTA income. Figure 9.2 shows the distribution of dually-enrolled beneficiaries in ACOs overall (bottom panel), for ACOs in the top quintile of dually-enrolled beneficiaries (middle panel, "Top 20"), and for ACOs in the bottom 80% of dual rates (top panel, "Bottom 80").

Figure 9.2: Distribution of Dually-enrolled Eligible Beneficiaries across ACOs (2014)



III. Beneficiary Social Risk Factors and Performance in the Medicare Shared Savings Program

Of the 33 measures used to determine an ACO's quality score in the Medicare Shared Savings Program, only three are based on claims data and thus can be analyzed to determine whether there is any underlying relationship with social risk at the patient level. The three measures are (1) Risk Standardized All-Condition Readmissions, (2) Admissions for Chronic Obstructive Pulmonary Disease (COPD) or Asthma in Older Adults, and (3) Admissions for Heart Failure (HF).

A. All-Condition Readmission

This readmission measure captures the risk-adjusted percentage of assigned beneficiaries who were hospitalized and readmitted to a hospital within 30 days of discharge from the index-hospital admission.

Analyses showed that dual and disabled beneficiaries were more likely to be readmitted to the hospital, even after controlling for differences in patient risk and practice selection. As shown in Table 9.3, 16.3% of dually enrolled beneficiaries were readmitted to the hospital in 2014, compared to 12.5% of other beneficiaries. Similarly, 15.8% of disabled beneficiaries were readmitted to the hospital, compared to 12.7% of other beneficiaries. Black beneficiaries and Hispanic beneficiaries were also more likely to have a readmission.

This difference might be explained by a variety of factors, including differences in patient factors (e.g., co-morbidities, family/caregiver support), and ACO/provider factors (e.g., dually-enrolled beneficiaries may disproportionately be seen by poor quality ACOs). Compared to non-dually-enrolled beneficiaries in the same ACO, however, dually-enrolled beneficiaries still had 36% greater odds of being re-admitted after an admission. After risk adjustment (for age, gender, and medical comorbidities), dually-enrolled beneficiaries still had an 18% greater chance of readmission, Black beneficiaries had a 12% greater chance of readmission, and beneficiaries with disabilities had a 19% greater chance of readmission (Table 9.3).

Table 9.3: Beneficiary Social Risk Factors and Performance on Medicare Shared Savings Program Readmission Measure (2014)

Social Risk Factor	Without Risk-Adjustment			Risk-Adjusted Within-ACO Odds Ratio
	Raw Rate		Within-ACO Odds Ratio	
	High Social Risk	Other (Ref.)		
Dual Enrollment	16.3%	12.5%	**1.36**	**1.18**
Disability	15.8%	12.7%	**1.29**	**1.19**
Black	15.9%	12.9%	**1.25**	**1.12**
Hispanic	14.3%	13.1%	**1.07**	1.03
Low-ZCTA-income	13.2%	12.6%	1.08	1.01
Patient Rurality	12.7%	13.3%	0.98	0.98

ZCTA=ZIP code tabulation area. All Bolded odds ratios are significant at p<0.001. Models are random effects models with risk adjustment using HCCs as specified by CMS. Results were qualitatively unchanged when including a term for the proportion of beneficiaries with the social risk factor of interest in the model to address residual confounding by ACO (also see Table 9.7).

B. Ambulatory Care Sensitive Conditions

Ambulatory care sensitive condition (ACSC) measures, also known as prevention quality indicators (PQIs), are measures developed by the Agency for Healthcare Research and Quality (AHRQ) that track potentially preventable admissions for conditions that ideally could be treated on an outpatient basis. The PQI score is a ratio of observed admissions to expected admissions. The Medicare Shared Savings Program used two ACSC measures in the Program Years examined for this report, namely COPD and heart failure. For these measures, the numerator is observed admissions for COPD or asthma in beneficiaries over 40 or heart failure in beneficiaries over 18 and the denominator is expected admissions based on prevalence of disease (any claim for COPD or HF), age, and gender; there is no adjustment for medical comorbidities in either measure (note: the 2017 PFS replaced these measures with a single ACSC composite that does include clinical risk adjustment; measure specifications and 2016 data were not available for simulation of that future measure at the time of the writing of this report).

As in the case of readmissions for these conditions, beneficiaries with social risk factors generally did worse in terms of preventable admissions. Within the same ACO, dually-enrolled beneficiaries had 39%

greater odds of being admitted for COPD, though slightly lower odds of being admitted for HF. Similarly, beneficiaries who were Black or Hispanic, beneficiaries with disabilities and beneficiaries from low-income ZCTAs had greater odds of being admitted for COPD than other beneficiaries, even after risk-adjustment. Black beneficiaries also had greater odds of being admitted for HF, even after risk-adjustment (Table 9.4).

Table 9.4: Beneficiary Social Risk Factors and Performance on Medicare Shared Savings Program PQI Measures (2014)

COPD				
	Without Risk-Adjustment			Risk-Adjusted Within-ACO Odds Ratio
	Raw Rate		Within-ACO Odds Ratio	
	High Social Risk	Other (Ref.)		
Dual Enrollment	1.2%	0.8%	**1.39**	**1.16**
Disability	1.1%	0.8%	**1.35**	**1.12**
Black	1.3%	0.9%	**1.38**	**1.42**
Hispanic	1.1%	0.9%	**1.21**	**1.12**
Low-ZCTA-income	0.9%	0.7%	**1.39**	**1.25**
Patient Rurality	1.0%	0.9%	**1.07**	**1.07**
HEART FAILURE				
	Without Risk-Adjustment			Risk-Adjusted Within-ACO Odds Ratio
	Raw Rate		Within-ACO Odds Ratio	
	High Social Risk	Other (Ref.)		
Dual Enrollment	2.0%	2.2%	**0.90**	**0.86**
Disability	2.2%	2.1%	1.01	0.98
Black	2.5%	2.1%	**1.18**	**1.34**
Hispanic	2.3%	2.1%	**1.15**	1.05
Low-ZCTA-income	2.1%	1.8%	**1.14**	1.04
Patient Rurality	2.2%	2.1%	1.02	0.99

Bolded odds ratios are significant at p<0.001. ZCTA=ZIP code tabulation area; PQI=prevention quality indicators. Random effects models were used for all odds ratios presented. Risk adjustment for the PQIs currently only includes age and gender category. Results were qualitatively unchanged when including a term for the proportion of beneficiaries with the social risk factor of interest in the model to address residual confounding by ACO (also see Table 9.7).

IV. ACO Social Risk Composition and Performance in the Medicare Shared Savings Program

To quantify how much of an ACO's performance was related to the ACO's overall performance versus the beneficiaries it served, two additional analyses were performed. First, beneficiaries seen at ACOs that served a high proportion of beneficiaries with social risk factors (dually-enrolled, disability, Black,

Hispanic, rural) were compared to beneficiaries in other ACOs. Beneficiaries in high-dual ACOs had a readmission rate of 14% versus 13.1% among beneficiaries in non-high-dual ACOs. However, these ACO-level effects largely disappeared once patient clinical risk was considered, suggesting that patient-level factors were the larger contributor to readmission rates (Table 9.5).

Table 9.5: ACO Social Risk Factors and Performance on Medicare Shared Savings Program Readmission Measure (2014)

	Without Risk-Adjustment			Risk-Adjusted Odds Ratio
	Beneficiaries in ACOs serving beneficiaries with social risk factors	Beneficiaries in Other ACOs	Odds Ratio	
High-Dual ACO	14.0%	13.1%	**1.13**	1.06
High-Disabled ACO	13.8%	13.1%	**1.09**	1.06
High-Black ACO	13.6%	13.1%	1.08	1.03
High-Hispanic ACO	14.1%	13.1%	**1.09**	1.04
Low-ZCTA-Income ACO	13.1%	13.2%	1.00	0.99
Rural ACO	12.6%	13.3%	0.96	0.97
Random effects models were used for all odds ratios presented. Bolded odds ratios significant at p<0.001.				

Examining the PQIs, beneficiaries in high-dual, high-disabled, and high-Black ACOs were more likely to have preventable admissions for COPD, even when clinical risk was considered. Beneficiaries in high-Black ACOs were also more likely to have a preventable admission for HF (Table 9.6).

Table 9.6: ACO Social Risk Factors and Performance on Medicare Shared Savings Program PQI Measures (2014)

COPD				
COPD	**Without Risk-Adjustment**			**Risk-Adjusted Odds Ratio**
	Beneficiaries in ACOs serving beneficiaries with social risk factors	**Beneficiaries in Other ACOs**	**Odds Ratio**	
High-Dual ACO	1.1%	0.9%	**1.22**	**1.19**
High-Disabled ACO	1.0%	0.9%	**1.19**	**1.14**
High-Black ACO	1.0%	0.9%	**1.24**	**1.24**
High-Hispanic ACO	1.0%	0.9%	1.04	1.09
Low-ZCTA-Income ACO	1.0%	0.9%	1.05	1.04
Rural ACO	0.9%	0.9%	1.05	1.01
ZCTA=ZIP code tabulation area. Random effects models were used for all odds ratios (ORs) presented. Bolded odds ratios are significant at p<0.001.				

Table 9.6 continued: ACO Social Risk Factors and Performance on Medicare Shared Savings Program PQI Measures (2014)

HEART FAILURE				
Heart Failure	**Without Risk-Adjustment**			**Risk-Adjusted Odds Ratio**
	Beneficiaries in ACOs serving beneficiaries with social risk factors	**Beneficiaries in Other ACOs**	**Odds Ratio**	
High-Dual ACO	2.1%	2.1%	1.00	0.99
High-Disabled ACO	2.2%	2.1%	1.06	1.06
High-Black ACO	2.3%	2.1%	**1.15**	**1.16**
High-Hispanic ACO	2.0%	2.1%	0.91	0.91
Low-ZCTA-Income ACO	2.2%	2.1%	1.03	1.01
Rural ACO	2.2%	2.1%	1.05	1.07
ZCTA=ZIP code tabulation area. Random effects models were used for all odds ratios (ORs) presented. Bolded odds ratios are significant at p<0.001.				

In a second analysis, both beneficiary and ACO factors were included in the same model, as shown in Table 9.7. In most cases, ACO-level factors were not significant when estimated with beneficiary-level factors, suggesting that beneficiary factors were the primary contributor to readmissions and preventable admission rates. An exception to this pattern is the case of admissions for COPD. Even after controlling for beneficiary factors, beneficiaries in high-dual ACOs had 14% greater odds, and beneficiaries in high-Black ACOs had 16% greater odds of admission for COPD than beneficiaries in other ACOs. This finding suggests that both ACO-level factors and beneficiary -level factors play a role in preventable admissions for COPD, though beneficiary factors dominate.

Table 9.7: Beneficiary vs. ACO Factors in Readmissions and Preventable Admissions, 2014

Beneficiary or ACO Characteristic	**Odds from Risk-Adjusted Random Effects Models**					
	All-Cause Readmissions		**Admitted for COPD**		**Admitted for HF**	
	Beneficiary	***ACO***	***Beneficiary***	***ACO***	***Beneficiary***	***ACO***
Dual Enrollment	**1.18**	1.00	**1.16**	**1.14**	**0.86**	1.04
Disabled	**1.19**	1.05	**1.12**	1.14	0.98	1.06
Black	**1.12**	1.00	**1.41**	**1.16**	**1.33**	1.08
Hispanic	1.02	1.04	**1.12**	1.06	1.06	**0.90**
Low-ZCTA-Income	1.01	0.99	**1.25**	1.03	1.04	1.01
Rural	0.98	0.98	**1.07**	0.98	0.99	1.07
ZCTA=ZIP code tabulation area. Random effects models were used for all odds ratios (ORs) presented. Bolded odds ratios are significant at p<0.001.						

V. ACO Social Risk and Performance on Quality and Savings in the Medicare Shared Savings Program

A. Performance on Quality Measures

Table 9.8 shows average scores for each quality measure for ACOs overall and for ACOs disproportionately serving beneficiaries with social risk factors. Differences between the overall score and scores for each sub-group of ACO (e.g., high-dual ACOs) were calculated with median regression due to non-normality of the data and small sample sizes (see Appendix for further description of methods). Bold font indicates a statistically significant difference; note there were no measures on which ACOs disproportionately serving beneficiaries with social risk factors outperformed all other ACOs.

Table 9.8: Median Performance in the Medicare Shared Savings Program by Measure Overall and for ACOs serving beneficiaries with social risk factors (2014)

Measure	Description	Overall (n=333)	High-Dual ACO	High-Disabled ACO	High-Black ACO	High-Hispanic ACO	Low-ZCTA Income ACO	Rural ACO
ACO-1	CAHPS: Getting Timely Care, Appts, Info	80.6	**78.6**	**79.0**	79.7	**78.3**	78.8	81.2
ACO-2	CAHPS: Provider Communication	92.7	**91.8**	92.1	92.4	92.0	92.6	92.8
ACO-3	CAHPS: Patient Rating of Provider	91.9	91.2	91.4	91.4	**90.8**	91.6	91.7
ACO-4	CAHPS: Access to Specialists	84.1	83.3	83.9	84.1	83.5	83.9	83.4
ACO-5	CAHPS: Health Promotion/Education	58.2	58.9	57.9	58.2	59.3	**56.3**	**56.5**
ACO-6	CAHPS: Shared Decision Making	74.7	73.9	74.3	**73.2**	74.5	74.6	74.5
ACO-7	CAHPS: Health Status/Functional Status	71.3	**69.6**	**69.7**	70.3	**69.7**	**69.6**	71.8
ACO-8	Risk-Standardized All-Condition Readmission	15.1	15.4	15.2	15.3	15.3	15.3	14.9
ACO-9	ACSC: COPD	1.0	**1.3**	1.1	**1.3**	1.1	1.0	1.0
ACO-10	ACSC: Heart Failure	1.2	1.2	1.2	**1.3**	1.2	1.2	1.1
ACO-11	% of PCPs Receiving EHR Incentive Payment	80.5	**65.4**	75.7	77.4	**63.8**	78.2	84.4
ACO-12	Medication Reconciliation	91.7	93.4	91.7	90.9	93.6	92.4	91.9
ACO-13	Screening for Fall Risk	44.7	44.7	42.9	38.1	38.5	41.4	48.3
ACO-14	Flu Vaccination	58.2	53.5	55.7	52.4	**52.0**	55.1	63.6
ACO-15	Pneumonia Vaccination	56.8	49.2	49.5	**45.3**	**44.7**	51.4	62.2
ACO-16	BMI Screening and Follow-Up	67.9	69.7	65.0	67.7	72.0	72.0	69.6
ACO-17	Tobacco Screening and Intervention	91.3	89.2	89.2	88.1	87.5	89.5	91.3
ACO-18	Depression Screening and Follow-Up	36.8	37.3	32.9	30.4	30.9	36.1	47.9
ACO-19	Colorectal Cancer Screening	57.7	48.2	51.2	54.2	**47.1**	53.0	62.0
ACO-20	Breast Cancer Screening	63.0	57.2	57.8	56.7	**55.3**	59.3	66.3
ACO-21	Hypertension screening and follow-up	59.3	65.8	60.7	56.5	69.9	59.5	60.9
ACO D	Diabetes Composite	26.3	**20.2**	**21.2**	**20.8**	21.7	22.0	23.8
ACO-22	Diabetes: Hypertension control	71.7	**67.1**	**67.6**	**67.5**	**65.6**	70.2	71.9
ACO-23	Diabetes: LDL Control	58.1	**52.8**	54.5	**50.7**	53.8	55.1	56.4

ACO-24	Diabetes: A1c Control	71.1	68.8	**67.9**	**65.9**	68.1	67.9	71.1
ACO-25	Diabetes: Aspirin or Antiplatelet if Vascular Disease	80.6	**73.3**	76.2	76.4	76.9	77.5	79.2
ACO-26	Diabetes: Tobacco Non-Use	84.5	83.7	86.3	82.9	**74.7**	82.5	86.2
ACO-27	Diabetes: A1c Poor Control	17.8	**22.1**	**21.8**	**22.3**	**24.4**	19.9	15.7
ACO-28	Hypertension: Control	69.4	67.3	66.5	**64.3**	66.7	66.4	68.9
ACO-29	Ischemic Vascular Disease: Lipid Panel and LDL Control	58.8	54.9	54.5	55.3	54.9	57.5	57.7
ACO-30	Ischemic Vascular Disease: Aspirin/Antithrombotic	85.6	82.2	86.3	84.0	**79.5**	84.1	88.0
ACO-31	Heart Failure: Beta-Blocker for LVSD	87.9	85.1	88.9	88.0	88.6	87.1	87.8
ACO C	CAD Composite	69.4	64.8	67.8	65.1	68.6	66.7	68.3
ACO-32	CAD: Lipid Control	77.0	75.2	75.2	73.2	75.4	75.3	76.5
ACO-33	CAD: ACE or ARB for Diabetes or LVSD	77.1	75.5	77.7	76.9	79.5	76.0	77.8

Scores shown are medians.
ACSC=ambulatory care sensitive condition; BMI=body mass index; CAD=coronary artery disease; CAHPS=Consumer Assessment of Healthcare Providers and Systems; COPD=chronic obstructive pulmonary disease; LVSD=left ventricular systolic dysfunction; LDL=low density lipoprotein.
Scores that are significantly different ($p<0.001$) from the overall median are bolded and shaded. Statistical significance was determined based on median regression due to small sample size and non-normality of the data.

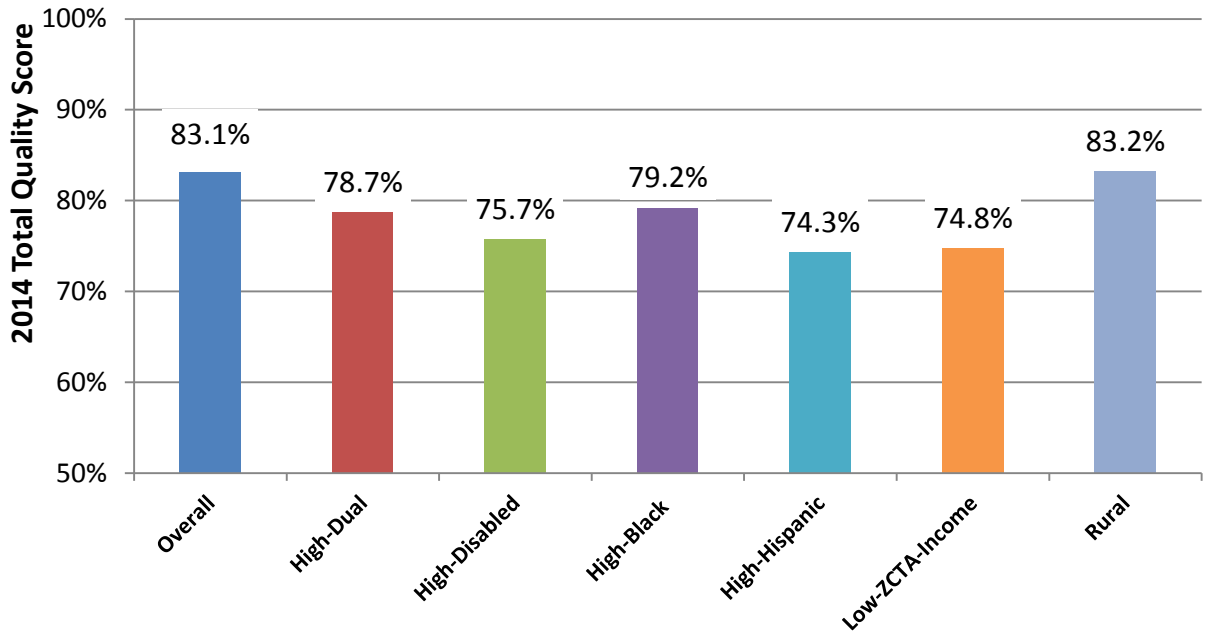
Table 9.9 summarizes quality performance by ACO social risk composition, using the same groups described above. Overall, there was no statistical difference on most scores.

Table 9.9: Summary of Quality Performance by ACO Social Risk Composition, 2014

Description	Measures with Worse Score	No Statistical Difference	Measures with Better Score
High-Dual ACO	10	23	0
High-Disabled ACO	5	28	0
High-Black ACO	9	24	0
High-Hispanic ACO	12	21	0
Low-ZCTA-Income ACO	2	31	0
Rural ACO	1	32	0

As described earlier, each ACO received a score for each measure and each domain (patient/caregiver experience, care coordination/patient safety, preventive health, and at-risk populations). Domain scores were then averaged to form an overall quality score on a scale of 0-100%. Figure 9.3 shows average 2014 quality scores for ACOs overall and ACOs that serve a high proportion of patients with social risks. In general, ACOs serving beneficiaries with social risk factors had lower quality scores than ACOs overall; these differences were small but statistically significant in the case of high-disabled ACOs (vs. non-high-disabled ACOs, p-value=0.002), high-Hispanic ACOs (vs. non-high-Hispanic ACOs, p-value<0.001), and low-ZCTA income ACOs (vs. non-low-ZCTA-income ACOs, p-value<0.001).

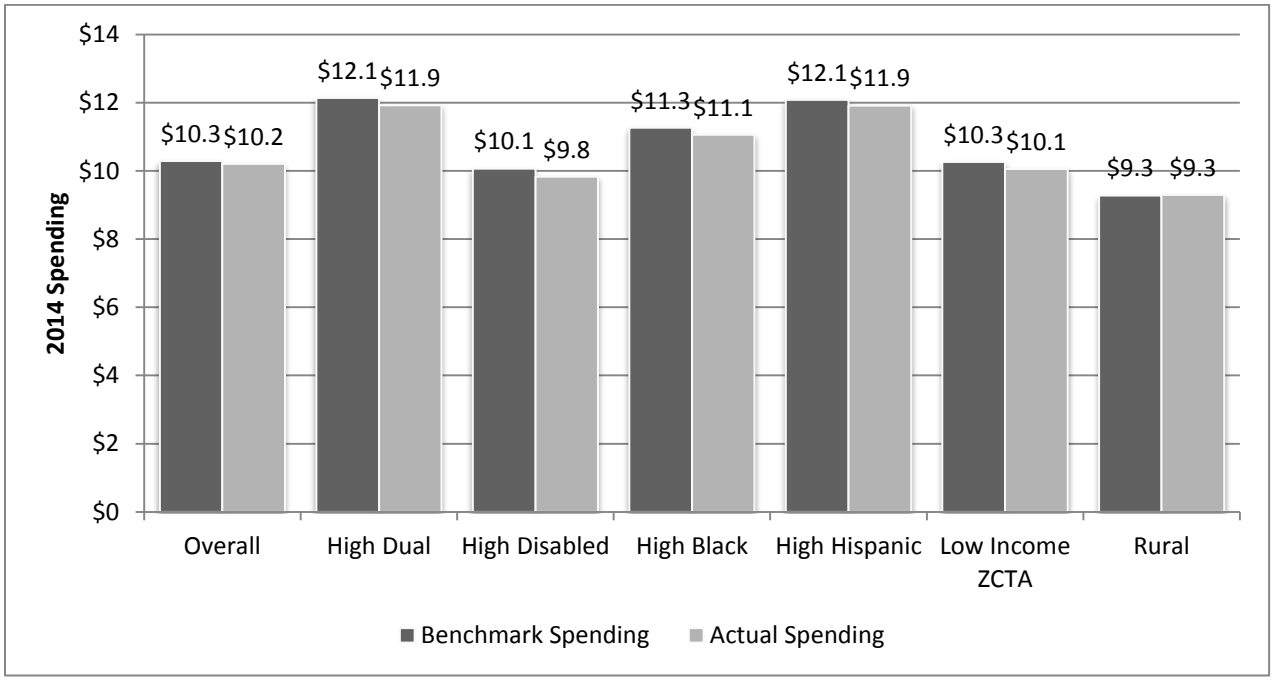
Figure 9.3: ACO Quality Scores by ACO Social Risk Composition, 2014



B. Performance on Spending and Savings

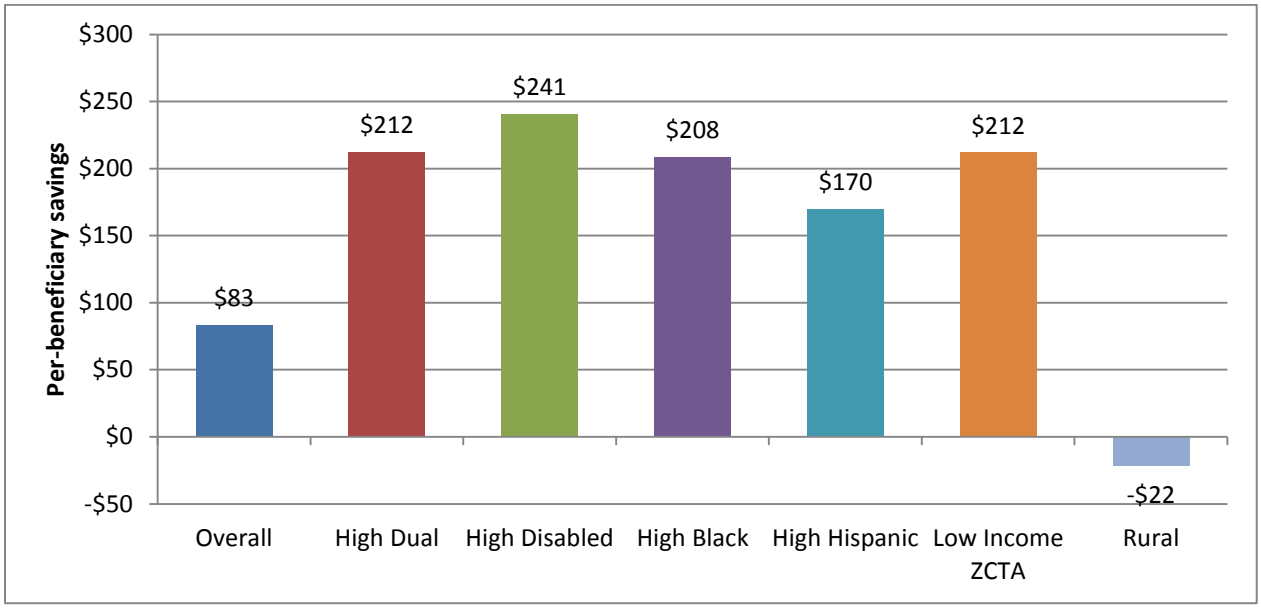
Figure 9.4 shows benchmark and actual spending in 2014 for ACOs overall and for each sub-group of ACOs serving beneficiaries with social risk factors. ACOs serving beneficiaries with social risk factors, in general, had higher benchmarks than average. For example, the benchmark for high-dual ACOs was $12,100 compared to $10,300 across all ACOs. Benchmarks for high-Black and high-Hispanic ACOs were similarly higher than average.

Figure 9.4: Per-Beneficiary Benchmark vs. Actual Spending by ACO Social Risk, 2014 (thousands of $)



ACOs serving beneficiaries with social risk factors also achieved greater savings than the average ACO (Figure 9.5). Figure 9.5 shows per-beneficiary savings for ACOs overall and by ACO social risk composition in 2014 (per-beneficiary savings were calculated based on the number of beneficiaries attributed to each ACO in 2014; note that this is equivalent to subtracting the actual from the benchmark in the figure above). On average, ACOs saved $83/beneficiary in year 2. High-dual ACOs saved substantially more, at $398/beneficiary, and other ACOs serving beneficiaries with social risk factors similarly saved more per beneficiary than ACOs overall. The exception was rural ACOs, in which the average savings was only $48.

Figure 9.5: Per-Beneficiary Savings by ACO Social Risk Composition, 2014



The next step after determining savings was determining whether the savings exceeded the MSR, and if so, determining the actual amount of the shared savings based on multiplying the potential savings by the quality score. Of the 333 ACOs participating in Medicare Shared Savings Program in 2014, 181 (54%) had actual expenditures under their benchmark, but only 92 (28%) had savings that met or exceeded their MSR (Table 9.10). Of these 92, 86 (26%) shared in these savings, meaning that they met the minimum quality performance standard. With the exception of rural-serving ACOs, a greater proportion of ACOs serving beneficiaries with social risk factors saved money than did ACOs overall. For example, 62% of high-dual ACOs had total expenditures less than benchmark, compared to 54% of ACOs overall. Further, a greater percentage of high-dual, high-Hispanic, high-Black, and high-disabled ACOs, as well as those serving a population living in low-income areas, earned shared savings. Rural ACOs were less likely to earn and share in savings (Table 9.10).

Table 9.10: ACO Expenditures and Savings by ACO Social Risk Composition, 2014

	Overall	High-Dual ACOs	High-Disabled ACOs	High-Black ACOs	High-Hispanic ACOs	Low-ZCTA-Income ACOs	Rural ACOs
ACOs with Any Savings (total expenditures < benchmark)	54.4%	62.1%	65.2%	66.7%	60.6%	62.1%	40.9%
ACOs with Savings > Minimum Savings Rate	27.6%	33.3%	43.9%	31.8%	37.9%	39.4%	18.2%
ACOs that Shared in Savings	25.8%	30.3%	37.9%	27.3%	34.8%	34.8%	16.7%

These findings show that ACOs serving a high proportion of beneficiaries with social risk factors were more likely to succeed in achieving savings and sharing in those savings despite having lower quality scores, with the exception of ACOs with a high proportion of rural beneficiaries.

VI. Policy Options for the Medicare Shared Savings Program

A. Introduction

Policy options are simulated, and weighed against the policy criteria outlined in Chapter 1 to ultimately inform strategies and considerations for accounting for social risk. Those policy criteria are reiterated in Table 9.11:

Table 9.11: Policy Criteria

Policy Criteria
1. Encourages reduction in disparities in quality and outcomes
2. Protects beneficiaries' access to care by reducing disincentives to caring for high-risk populations
3. Protects providers from unfair financial stress
4. Adjusts only for the difference in performance related directly to the social risk factor, and only for what is beyond provider control
5. Promotes transparency to facilitate consumer choice
6. Supports delivery system reform and Alternative Payment Models

How policymakers weight these criteria could differ. For example, some may feel that protecting providers from unfair financial stress is the most important criterion, and may be willing to adjust for factors under providers' control or negatively impact transparency to achieve that goal. On the other hand, some may feel that transparency is the most important criterion, and argue that avoiding financial stress for providers or promoting delivery system reform are less important policy considerations.

Four policy options were considered for modifying the current Medicare Shared Savings Program: determining that no changes are necessary (status quo), modifying or adding risk adjustment, rewarding improvement, and providing bonuses to ACOs that serve a socially at-risk population and perform well in such a population. These options are displayed in Table 9.12, followed by a more detailed explanation of each option with a simulation of the proposed policy's potential impact. For other programs discussed in this report, stratification was another policy option considered. In the Medicare Shared Savings Program, however, there is little rationale for stratification given that there was little difference between the performance of high social risk and other ACOs and thus less reason to control for unmeasurable differences between these types of ACOs that may drive performance, as this risks adjusting for factors broader than the social risk factor and/or under providers' control. Further analyses once the Medicare Shared Savings Program is in later years are also recommended.

The remainder of this section provides a more detailed explanation of each option, as well as results of policy simulations of the proposed policy's potential impact. In addition, Section 5 below presents discussion and simulation of the effects of regional benchmarking as outlined in the June 6, 2016 Final Rule.

Table 9.12: Summary of Medicare Shared Savings Program Policy Options

Option	Description	Pros	Cons
1. Status Quo	Maintain current (2016) Medicare Shared Savings Program policy.	Costs are already risk-adjusted, and there are only small differences in quality between ACOs. High-social-risk ACOs had higher savings. Program is new and evolving. May avoid reducing incentives to improve quality.	Newly entering high risk ACOs may have populations that are more challenging to manage, leading to more differentiation among these ACOs relative to the existing overall ACO population.
2. Adjust ACSCs for medical comorbidities; adjust ACSCs and readmissions for social risk	Add HCC risk score to the ACSC model (note: a new ACSC measure that does include risk adjustment was finalized in the 2017 PFS; measure specifications and data were not available to simulate this future measure at the time this report was written). Add social risk factors to the formulas for calculating the ACSCs and readmission measures.	May protect ACOs from unfair financial stress, may reduce disincentives to caring for high-risk populations, may support delivery system reform.	Risks adjusting for differences in performance related to bias or discrimination, or masking poor quality.
3. Reward Improvement (note: part of current Medicare Shared Savings Program)	Reward ACOs that improve as well as those that achieve high performance.	May encourage reductions in disparities, may support delivery system reform.	Could negatively impact transparency.
4. Payment adjustment for achievement or improvement specifically for beneficiaries with social risk factors	Provide opportunity for additional points on quality score for high performance in high risk ACOs.	May reduce disincentives to caring for high-risk populations, may encourage reductions in disparities.	Risks adjusting for factors under providers' control.
5. Regional Benchmarking (Final Rule)[3]	Update benchmarks to reflect an ACO's performance relative to other providers in the same regional market.	Improve the program's incentives for ACOs by recognizing an ACO's efficiency relative to its region.	Since high-dual and other ACOs serving beneficiaries with social risk factors are more expensive at baseline, may make it more difficult to achieve savings.

B. Policy Simulation Results

1. Status Quo

Results from the first two years of the Medicare Shared Savings Program suggest that the program's current method of risk-adjusting cost benchmarks has minimized differences in performance between socially at-risk and all other ACOs. Though ACOs serving beneficiaries with social risk factors had lower overall quality scores than other ACOs, these differences were small in magnitude. Further, the quality score is solely used as a multiplier to determine the amount of savings that the ACO will share, thereby mitigating the effects that quality differences have on overall program outcomes with respect to sharing in savings. High-dual and high-disabled ACOs, as well as those serving relatively large Black and Hispanic populations had higher cost benchmarks, reflecting the facts that these populations are costlier and that benchmarks are based on three years of prior spending. These ACOs were thus more likely to achieve and share in savings.

The fact that ACOs serving beneficiaries with social risk factors do not seem to be penalized in terms of program outcomes is important to note. Quality in the Medicare Shared Savings Program overall is excellent; for example, performance on the readmissions measure is better on average in the Medicare Shared Savings Program than for hospitals overall, when comparing risk-adjusted readmission rates. Performance on other quality measures is similarly high across the program. It is possible that this is due to the fact that many ACOs have been exploring social determinants of health, and recognize the value of partnering with community stakeholders to address beneficiary issues that may be prevalent in beneficiaries with social risk factors that may be impact the beneficiary's ability to, for example, adhere to medication regimens or get transportation to clinic appointments. Developing individualized care plans and working in partnership with other practitioners and community services is an eligibility requirement in the program, and may underlie some of these successes.

However, while absolute performance is high in the Medicare Shared Savings Program, disparities between dually-enrolled and non-dually enrolled beneficiaries are still evident on readmissions and ambulatory care-sensitive conditions; this may underscore the fact that even in high-performing systems, such disparities are complex, and not easily or quickly eradicated. It will be critical to track the successes of these groups over time to determine which strategies are particularly promising and could potentially be shared more broadly.

It is also worth noting that the Medicare Shared Savings Program is currently a voluntary program, and many of the early participants have been large health systems, hospitals, and group practices that already have much of the necessary infrastructure in place to succeed in the program. As the ACO model becomes more widespread (e.g., through the proliferation of alternative payment models under the Medicare Access and CHIP Reauthorization Act of 2015 (MACRA)), it will be critical to monitor the performance of ACOs serving beneficiaries with social risk factors that may lack infrastructure to provide systems support for quality, or that may not yet have built community partnerships or pursued other strategies that may be critical for achieving good outcomes in beneficiaries with social risk factors.

Other upcoming and potential changes, such as the move to regional benchmarking, may have implications for ACOs serving beneficiaries with social risk factors, as discussed below. Additional policy adjustments could potentially be made as well to adjust quality scoring to more accurately reflect patient factors that are out of ACO control, thereby limiting the extent to which ACOs are held accountable for these factors.

2. Adjustment for Medical and Social Risk

This policy option would involve directly adjusting quality measures for medical and social risk factors. Advantages to this policy option is that it may protect providers from unfair financial stress, may reduce disincentives to caring for high-risk populations, and may support delivery system reform and Alternative Payment Models by making the program feel more equitable to those concerned about the potential negative impact of serving beneficiaries with social risk factors on performance. However, adjustment for social risk factors in particular risks adjusting for differences in performance related to bias or discrimination, or masking poor quality. Another potential adverse effect of directly adjusting for social risk is that this adjustment might mask absolute quality differences among ACOs, making transparency efforts directed at consumers (i.e., to help them pick a provider-ACO combination) more challenging.

Adjusting for medical risk is less controversial, and is currently done in most outcome measures in the Medicare program. However, the ACSC measures are currently not adjusted for medical risk; while this may be appropriate for large groups of patients (the measure was developed for use at the geographic level – for example, states and counties), it becomes problematic when comparing provider groups that serve smaller patient populations that may vary dramatically in terms of medical risk. Risk-adjusting ACSC measures for "demographic variables and comorbidities" was finalized in the 2017 PFS (published November 2016), along with moving from condition-specific measures to a composite of the acute ACSCs. Measure specifications and data for this future measure were not available at the time this report was written, so simulations could not be performed.

Medical or social risk adjustment would be applied directly at the measure level; any alterations to measures would likely require re-entering the testing, validation, and approval process with the National Quality Forum. Adjustment would be budget-neutral, since benchmarks are re-set each year by the distribution of performance across the ACO program.

In the case of both the ACSC measures and the readmissions measure, the analyses described in this chapter showed evidence of a significant dual enrollment effect that was largely within-ACO in nature. This policy option was not simulated due to unexpected data issues. However, these adjustments would be anticipated to have small effects on savings and shared savings, since it would only impact three of the quality measures that are included in the quality score for each ACO; therefore simulations are not shown.

3. Rewarding Improvement

In the initial years of the program, the Medicare Shared Savings Program rewarded achievement but not improvement, in contrast to other Medicare pay-for-performance programs such as Hospital Value-

Based Purchasing, which explicitly incorporate improvement into scoring methodology. However, CMS has recently begun rewarding ACOs for quality improvement by adding points to their domain scores. ACOs may earn up to 4 points in each domain based on quality improvement, up to the maximum available points in each domain.

Rewarding improvement meets the policy criteria of encouraging reductions in disparities, since it could potentially encourage improvement even among ACOs that are unlikely to meet the minimum quality threshold. It may also support delivery system reform and Alternative Payment Models by making the program feel more equitable to those concerned about the potential negative impact of serving beneficiaries with social risk factors on performance. One drawback is that it could negatively impact transparency, if quality scores were reported without indicating how much was the result of improvement vs. achievement.

For this simulation, domain scores were recalculated incorporating quality points for significant year-over-year quality improvement for all ACOs (using the methodology currently used by CMS to do so). Note this analysis was therefore limited to the ACOs that were in both years of program data. Adjusted quality scores were then used, in combination with the savings rate, to assess how many ACOs achieved savings and shared in savings overall and by ACO type, as shown in Table 9.13. This simulation showed that including improvement points may be associated with an increase in the percent of ACOs (high-dual and non-high-dual) that share in savings and an increase in savings per beneficiary for high-dual ACOs. As seen in analyses presented earlier in this chapter, these ACOs are already more likely to have savings, have higher savings, and share in savings, so this policy option further increased shared savings compared to other ACOs.

Table 9.13: Simulated Effects of Rewarding Quality Improvement in the Medicare Shared Savings Program

	Current Program		With Improvement Points	
	% of ACOs with Shared Savings	Savings per Beneficiary	% of ACOs with Shared Savings	Savings per Beneficiary
All ACOs	25.8%	$313	27.6%	$305
High-Dual ACOs	30.3%	$378	33.3%	$408
All Other ACOs	24.7%	$293	26.2%	$273

4. Providing Payment Adjustments for High Performance or Improvement in Beneficiaries with Social Risk Factors

Under this option, ACOs that either perform well or demonstrate significant improvement and serve a high proportion of beneficiaries with social risk factors would receive an additional performance bonus, which would translate to a higher shared savings rate. ACOs would only receive the payment adjustment if they met both the savings and quality standards. This policy is modeled on a payment

adjustment offered in the Physician Value-Modifier program, where practices receive an additional bonus if they perform well and treat beneficiaries that have relatively high medical risk.

The strengths of this option are that it may reduce disincentives to caring for high-risk populations (and in fact may create incentives to care for these groups), and may encourage reductions in disparities by putting a focus on beneficiaries with social risk factors. The drawback is that it may reward providers for poor performance due to factors under their control, though the provision that only ACOs that meet the quality standard receive an adjustment protects against this to some degree. This option would likely not be budget-neutral unless coupled with another change to the program.

Under the first component of this simulation, ACOs that were eligible for shared savings (i.e., those meeting the minimum savings rate and quality threshold) and that had a high proportion of beneficiaries with social risk factors got an additional bonus on their quality score, which had the effect of raising the percent of their savings that they kept (shared savings). For an ACO eligible for shared savings and with a dual rate in the top quintile, the ACO's quality score (and thus shared savings rate) was multiplied by 1 + (%dual/2), so, for example, an ACO with 80% dually-enrolled beneficiaries would have its shared savings rate multiplied by 1+ (0.8/2), or 1.4. As shown in Table 9.14, under this special payment adjustment option, high-dual ACOs would receive close to an additional $100 in shared savings per beneficiary, on average, compared to the current program.

Table 9.14: Simulated Effects of Bonuses for High-Performing ACOs serving beneficiaries with social risk factors in the Medicare Shared Savings Program

	Current Program		With Performance Bonus	
	% of ACOs with Shared Savings	Savings per Beneficiary	% of ACOs with Shared Savings	Savings per Beneficiary
All ACOs	25.8%	$313	25.8%	$327
High-Dual ACOs	30.3%	$378	30.3%	$460
All Other ACOs	24.7%	$293	24.7%	$287

The second way in which this policy was simulated was by providing an additional performance bonus for improvement based on the proportion of dually-enrolled individuals in an ACO. The same methodology was followed as in the "improvement" option above (Table 9.13), but ACOs that were in the highest quintile of proportion dual received an additional point bonus consisting of their improvement points multiplied by their percent dually-enrolled (so an ACO with 75% dually-enrolled beneficiaries receiving 2 improvement points would receive an additional 2*0.75=1.5 improvement point bonus).

This simulation demonstrated slightly higher rates of achieving savings for all ACOs, and significantly higher savings per beneficiary for high-dual ACOs.

Table 9.15: Simulated Effects of Bonuses for High-Improving ACOs serving beneficiaries with social risk factors in the Medicare Shared Savings Program

	Current Program		With Scaled Improvement Bonus	
	% of ACOs with Shared Savings	Savings per Beneficiary	% of ACOs with Shared Savings	Savings per Beneficiary
All ACOs	25.8%	$313	27.6%	$309
High-Dual ACOs	30.3%	$378	33.3%	$421
All Other ACOs	24.7%	$293	26.2%	$273

5. Medicare Shared Savings Program-Specific Simulation: Regional Cost Benchmarking

In June 2016, a Final Rule for the Medicare Shared Savings Program was issued in the Federal Register (81 Fed. Reg. 37950). This rule outlined changes to the methodology for rebasing and updating ACO cost benchmarks for ACOs entering a second or subsequent agreement period to allow for integration of regional factors, thus making the ACO cost target less dependent on historical expenditures and more reflective of regional FFS spending. These adjustments would recognize that costs of care and trends in cost differ substantially by region; incorporating a regional factor could particularly improve incentives for lower-cost ACOs located in areas with high underlying cost growth.

Per the rule, each ACO's benchmark will reflect both its own historical spending and spending in the ACO's region. A phased approach will be used to transition to a higher weight on the regional adjustment, including separate phase-in periods for ACOs with lower vs. higher-spending ACOs. For ACOs determined to have spending higher than their region, a lower weight will be placed on the regional adjustment in order to give these ACOs time to adjust to the new methodology. In the first agreement period to which the regional adjustment is applied, the weight placed on the regional difference will be 25% for higher spending ACOs and 35% for other ACOs. In the second agreement period in which the adjustment is applied, the weights will be 50% and 70% for higher- and lower-spending ACOs, respectively. Finally, in the third agreement period where the adjustment is applied, a weight of 70% will be placed on the regional adjustment for all ACOs. Additionally, a regional expenditure growth rate would be used in place of the national expenditure trend when trending forward benchmark years, and in place of the national growth amount for updating the ACO's historical benchmark in each performance year.

The simulated effects of rebased ACO benchmarks incorporating regional spending and trends under three scenarios are shown in Table 9.16 and represented graphically in Figure 9.6, with the current scenario (0% regional benchmark) shown first, then the 35%/25% regional benchmark, and then the 50%/70% regional benchmark next. As intended, incorporating regional spending had an overall positive impact on the number of ACOs that saved, met the minimum savings rate, and were eligible for shared savings. Under the current benchmarking methodology, 26% of ACOs were eligible for shared savings in

2014; under the regionally adjusted benchmark, this rate increased to 53% in the first agreement period (35%/25% weight) and 70% with the 50%/70% weight applied.

Regional benchmarking, however, widened the gap in the percent achieving shared savings between high-dual and other ACOs, as high-dual ACOs had higher benchmarks at baseline, though high-dual ACOs still had higher savings than other ACOs under all scenarios. This was not unexpected, given that high-dual ACOs have higher benchmarks based on their own historical spending, which may reflect the fact that dually-enrolled beneficiaries tend to have significantly higher resource use (see analyses on the MPSB measure in the HVBP chapter for further information).

Table 9.16: Simulated Effects of Rebased ACO Benchmarks Incorporating Regional Spending and Trends

	Current Program		35%/25% Regional		70%/50% Regional	
	% of ACOs with Shared Savings	Savings per Beneficiary	% of ACOs with Shared Savings	Savings per Beneficiary	% of ACOs with Shared Savings	Savings per Beneficiary
All ACOs	25.8%	$313	53.2%	$393	69.4%	$604
High-dual ACOs	30.3%	$378	40.9%	$431	53.0%	$724
All Other ACOs	24.7%	$293	56.2%	$386	73.4%	$582

These changes can also be seen graphically, as shown in Figure 9.6:

Figure 9.6: Percent of ACOs Achieving Shared Savings under Regional Benchmarking

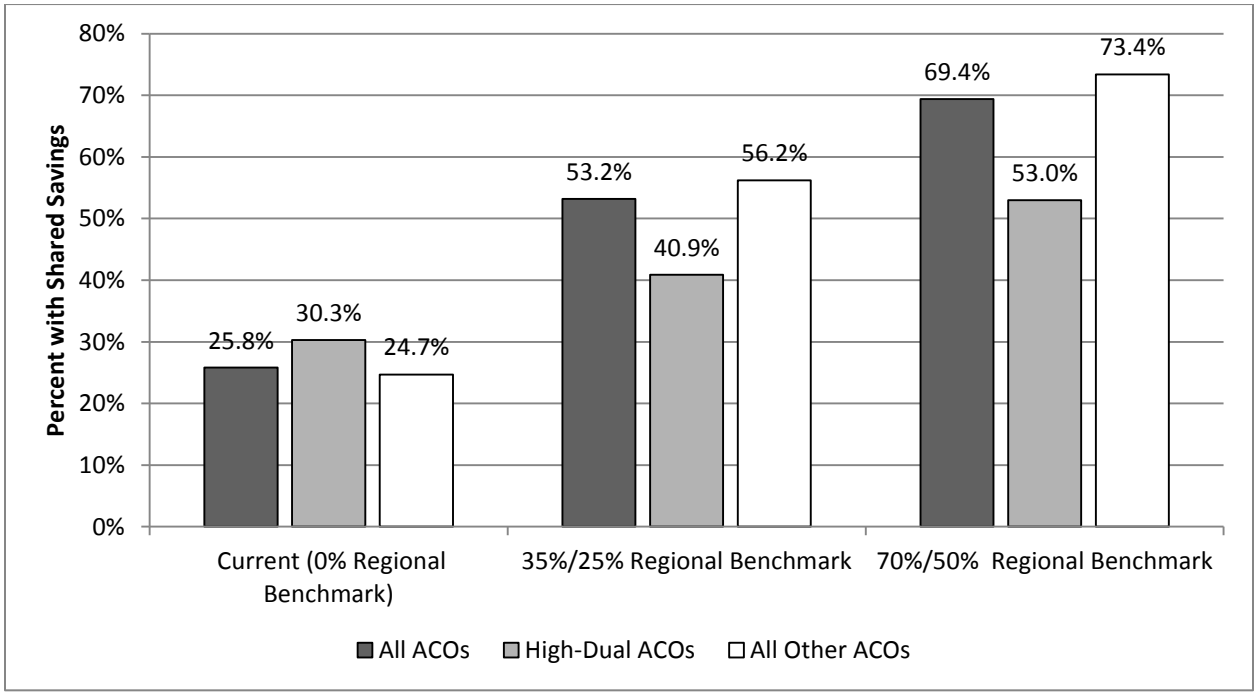


Figure 9.6 demonstrates that both high-dual and non-high-dual ACOs are more likely to achieve shared savings under regional benchmarking than under the current program. However, moving to even a 35%/25% regional benchmark blend would create a scenario in which high-dual ACOs become less likely to do so than their non-high-dual counterparts.

Note that the analyses presented here are simulations based on the methodology described in the 2016 Final Rule and data made available by CMS; actual ACO performance could vary significantly from simulations. The actual effects of these changes should be re-analyzed in the future once programmatic data are available to assess the implications of changes for beneficiaries and providers in ACOs serving high social risk beneficiaries.

C. Summary of Policy Options

Each of the policy options presented has strengths and weaknesses, and should be considered in the context of the policy goals outlined in the introductory chapters and the potential for positive impact. Table 9.17 presents the proportion of ACOs with shared savings and summarizes the amount of savings per beneficiary under each policy option. Overall, policy changes to the quality scoring have relatively little effect, though in most cases there is a small increase in the percent of ACOs with shared savings and in all cases there is an increase in savings per beneficiary.

Table 9.17: Summary of Policy Simulations for Medicare Shared Savings Program

Policy Option	ACO Sample	% of ACOs with Shared Savings	Savings per Beneficiary
Status Quo	**All ACOs**	26%	$313
	High-dual	30%	$378
	All other	25%	$293
Rewarding Quality Improvement	**All ACOs**	28%	$305
	High-dual	33%	$408
	All other	26%	$273
Providing Payment Adjustments for High Performance in Beneficiaries with Social Risk Factors	**All ACOs**	26%	$327
	High-dual	30%	$460
	All other	25%	$287
Providing Payment Adjustments for High Improvement in Beneficiaries with Social Risk Factors	**All ACOs**	28%	$309
	High-dual	33%	$421
	All other	26%	$273
35%/25% Regional Benchmarking	**All ACOs**	53%	$393
	High-dual	41%	$431
	All other	56%	$386
79%/50% Regional Benchmarking	**All ACOs**	69%	$604
	High-dual	53%	$724
	All other	73%	$582

VII. Key Findings, Strategies, and Considerations

A. Key Findings

Underlying Relationships

- Dually-enrolled beneficiaries, beneficiaries with disabilities, and Black beneficiaries were more likely to be readmitted to the hospital, even after controlling for differences in patient risk and practice selection. These disparities were very similar to those found in the HRRP analyses (Chapter 5), though the raw readmission rates in ACO beneficiaries in general were lower than those seen in the overall FFS population.
- Within the same ACO, dually-enrolled, Black, and Hispanic, beneficiaries, as well as beneficiaries with disabilities and those from low-income ZCTAs, had greater odds of being admitted for COPD (but not for HF) than other beneficiaries, even after risk-adjustment.
- Beneficiary-level factors were generally a larger contributor to readmission rates than ACO-level factors. However, for PQI measures, beneficiaries in high-dual, high-disabled, and high-Black ACOs were more likely to have preventable admissions for COPD, even once patient clinical risk was taken into consideration.

Cost and Quality Performance among ACOs Serving Socially at-risk Populations

- ACOs disproportionately serving beneficiaries with social risk factors had statistically comparable scores on the majority of quality measures to ACOs serving an average population.
- ACOs disproportionately serving beneficiaries with social risk factors, on average, had higher cost benchmarks than ACOs overall.
- In general, ACOs disproportionately serving beneficiaries with social risk factors had greater savings and were more likely to share in savings relative to ACOs overall.
    - With the exception of ACOs with a high proportion of rural beneficiaries, a greater proportion of high-risk ACOs saved money than ACOs overall. ACOs serving beneficiaries with social risk factors, in general, achieved greater savings than the average ACO.
    - A greater percentage of high-dual, high-Hispanic, high-Black, and high-disabled ACOs, as well as those serving a relatively poorer population (as measured by ZCTA income), earned shared savings.

Policy Simulations

- Adding improvement points increased the proportion of ACOs that achieved shared savings, and increased the per-beneficiary savings for high-dual ACOs.
- Providing a performance score bonus for ACOs that performed well or improved significantly and served a high-dual population increased their per-beneficiary savings.
- Moving to a regional benchmark was associated with higher absolute savings for high-dual ACOs but created a disparity between these and other ACOs in terms of the likelihood of achieving shared savings.

B. Strategies and Considerations

Strategies and considerations are outlined below. They are, as in all program chapters in this report, organized into three broad strategies that best meet the policy criteria outlined in Chapter 1. 1) Measure and report quality for beneficiaries with social risk factors; 2) Set high, fair standards for all beneficiaries; and 3) Reward and Support Better Outcomes for Beneficiaries with Social Risk Factors.

STRATEGY 1: Measure and Report Quality for Beneficiaries with Social Risk Factors

Measurement and reporting are foundational for quality improvement in health care.

CONSIDERATION 1: Consider enhancing data collection and developing statistical techniques to allow measurement and reporting of performance for beneficiaries with social risk factors on key quality measures.

The ability to measure and track quality and outcomes for beneficiaries with social risk factors is crucial as providers seek to reduce disparities and improve care for these groups to the greatest degree possible.

However, currently, there are areas in which data limitations make calculating and reporting performance for at-risk subgroups difficult. For measures currently collected on only a sample of patients, such as those related to patient experience and processes of care, a strategy should be developed to capture data that would allow calculation and reporting of performance by important subgroups. This strategy would allow the Department and ACOs, as well as consumers, to better-understand who performs well for dually-enrolled beneficiaries and where there are particular areas for targeted improvement. This is consistent with the policy goal of encouraging reductions in disparities in quality and outcomes, and also promotes transparency to facilitate consumer choice.

Alternate sampling methods may be necessary for stratified reporting for measures in which sample size is currently too small. Such methods could include stratified samples rolled over multiple measurement periods, or allowing survey vendors to collect additional demographic data for the HCAHPS. Harmonizing data collection with other quality programs, including the Merit-Based Incentive Payment System or Medicare Advantage, could increase the efficiency of data collection while at the same time allowing better identification of disparities in care and outcomes.

CONSIDERATION 2: Measure developers should develop key quality measures and/or statistical approaches suitable for reporting of performance for beneficiaries with social risk factors.

When adequate data are available, key quality and resource use measures stratified by social risk should be developed and considered for ACO feedback and/or public reporting, so that ACOs, policymakers, and consumers can see and address important disparities in care. While not all measures may lend themselves to reporting by subgroup, a key subset of measures should be pursued for subgroup reporting at the ACO level. Monitoring of quality performance will be especially important as new ACOs that may be more representative of the Medicare beneficiary and provider population overall enter

Medicare Shared Savings Program; early identification of disparities, if present, could be critical for informing targeted interventions as the program expands.

CONSIDERATION 3: When feasible, consider developing and introducing a new measure or domain on Achieving Health Equity to the Medicare Shared Savings Program to assess and reward ACO efforts to reduce health disparities.

Financial incentives help providers prioritize areas for particular focus, and specific measures targeting equity within existing value-based purchasing programs can therefore send a powerful signal. This may be achieved by adding a health equity measure or domain to existing programs.

A measure or domain for health equity should be added to the ACO quality metrics to provide an explicit incentive and expectation of reducing health disparities for participants in the Medicare Shared Savings Program. As there are no currently in-use health equity measures in the Medicare programs, this will require development and testing, and is not feasible in the short term. A measure of health equity may play an important role in ensuring that pay-for-performance programs help to incent, rather than disincent, improving care for beneficiaries with social risk factors. This approach would align with the policy criterion of encouraging reduction of disparities.

Specific approaches or measure(s) related to health equity have not been evaluated; however, measures could include performance on measures of disparity reduction (within an ACO, or compared to a national benchmark for the patient subgroup of interest), or include structural measures to give credit to ACOs that have undertaken quality improvement efforts targeting beneficiaries with social risk factors.

CONSIDERATION 4: Prospectively monitor costs and savings for ACOs disproportionately serving high proportions of dually-enrolled beneficiaries as the benchmark rebasing methodology that accounts for factors based on FFS spending in the ACO's regional service area takes effect.

Under regional benchmarking, the overall proportion of ACOs that achieved shared savings may increase; this may be a positive change for many ACOs, including many high-dual ACOs. However, under these calculations, high-dual ACOs became somewhat less likely than other ACOs to meet cost targets. It will be important to monitor the impact of these changes to the ACO benchmarking methodology if they move forward. Ensuring that high-dual ACOs are not penalized by benchmarking methods will likely increase the potential that these ACOs will remain in the program and improve their capacity to serve beneficiaries with social risk factors, consistent with the policy criteria of reducing disparities and protecting ACOs from unfair financial stress. Further, monitoring the differential effects of benchmarks will help ensure that this policy does not discourage providers from joining Alternative Payment Models.

STRATEGY 2: Set High, Fair Standards for All Beneficiaries

Given the overarching goal of improving care for all beneficiaries, providers should be held to high, fair standards regardless of the beneficiaries they serve.

CONSIDERATION 1: The measures used in the Medicare Shared Savings Program should continue to be examined to determine if adjustment for social risk factors is appropriate.

Overall, while there were differences between patient outcomes on quality measures (e.g., readmissions and preventable admissions) among beneficiaries with social risk in ACOs and other beneficiaries, ACOs serving beneficiaries with social risk factors did not appear to be financially penalized by the Medicare Shared Savings Program. Future work could focus on understanding the reasons for the underlying differences in outcomes, and determining whether ACOs that focus on addressing social risk are more successful in improving these outcomes.

The Medicare Shared Savings Program benchmark and spending calculations, which are not a "measure" per se, but rather part of the accounting of the program, should continue to calculate spending and trends by subgroup as is currently done. Under the current program, ACOs serving socially at-risk beneficiaries were more likely to achieve savings and earn more in savings amounts than ACOs on average, due largely to the fact that they had higher cost benchmarks at baseline. The success of ACOs serving beneficiaries with social risk factors in Medicare Shared Savings Program reflects the fact that the financial impacts of the program are driven by the achievement of cost savings compared to an ACO's own historical spending, and costs are risk-adjusted in benchmark calculations. Thus, the Medicare Shared Savings Program is a good example of the value of risk-adjusting costs for beneficiary characteristics among providers serving populations with high levels of social risk, and also of an inherent focus on improvement. This type of adjustment can help reduce disincentives to caring for beneficiaries with social risk factors.

CONSIDERATION 2: Ambulatory care-sensitive condition admission measures should account for medical risk, as CMS has announced will be done in future program years (see 2017 PFS final rule, published November 2016).

Risk adjusting ACSC measures for "demographic variables and comorbidities" was finalized in the 2017 PFS final rule, as CMS plans to move to an ACSC acute composite with risk adjustment included. If other ACSC measures are added to the program in the future, they should similarly be updated to include clinical risk adjustment.

CONSIDERATION 3: Program measures should be studied to determine whether differences in health status might underlie the observed relationships between social risk and performance, and whether better adjustment for health status might improve the ability to differentiate true differences in

performance between providers. Attention should also be given to developing quality and outcome measures specific to the ACO setting.

Given the significant differences seen between dual and non-dual individuals on the ACSC and readmissions measures, these metrics should be examined to determine if adding better measures of severity of illness, functional status, frailty, and/or medical complexity may explain some of the excess risk associated with dual enrollment. Dually-enrolled beneficiaries have health and social needs that may be more substantial and require more resources to address than non-dually-enrolled beneficiaries, such as lack of family or caregiver support, functional or cognitive limitations, and greater medical complexity. Thus, adding measures of functional status, frailty, and/or other measures of medical complexity to the readmissions and ACSC measures used in Medicare Shared Savings Program may help ensure that providers do not face undue financial stress, and reduce disincentives to caring for high-risk populations.

Attention should also be given to developing quality and outcome measures specific to the ACO setting. Currently, some of the measures in use in the program were developed in the hospital setting or broader outpatient setting; their properties and performance may be very different when applied to ACOs. As the ACO programs mature, having measures designed for the ACO setting may allow better distinctions in quality between ACOs. CMS currently follows the Secretary's Core Quality Measures Collaborative recommendations for ACOs, and measures that are used are largely those developed by measure owners and NQF endorsed. Therefore, this (along with many if not most of the considerations in this report) will require external stakeholder support and input.

STRATEGY 3: Reward and Support Better Outcomes for Beneficiaries with Social Risk Factors

One of the important findings in this chapter was the wide distribution of performance among providers disproportionately serving beneficiaries with social risk factors. This suggests that achieving better outcomes for these groups is feasible. However, in many cases it may require more effort on the part of providers, or more resources and more support, than achieving the same outcomes in a lower-risk population.

CONSIDERATION 1: Consider providing additional financial incentives to reward ACOs that achieve high quality or significant improvement specifically for beneficiaries with social risk factors.

Achievement and/or improvement in high-risk populations should be rewarded, and this could be done by adding targeted payment adjustments to existing value-based purchasing programs.

An additional payment adjustment could be created for ACOs achieving high quality and serving a particularly socially at-risk population, as modeled above, or an additional payment adjustment could be provided specifically for achieving high performance in socially at-risk populations. The latter would more specifically leverage value-based payment to improve care for these beneficiaries, and offset potential incentives to avoid providing care to beneficiaries perceived to be at high risk of poor outcomes.

This type of approach has precedent in the Physician Value-based payment modifier Program and may provide additional protection against any incentives that the shared savings model may create to avoid caring for high-risk beneficiaries. This consideration is consistent with the policy goals of protecting providers from unfair financial stress and encouraging reduction in disparities in quality, and outcomes. Finally, given that under the recent proposed rule for the Quality Payment Program, Tracks 2 and 3 of the Medicare Shared Savings Program have the potential to meet all criteria necessary for designation as an Advanced APM, such a bonus could also encourage participation of providers serving beneficiaries with social risk factors in the program.

CONSIDERATION 2: Consider using existing or new quality improvement programs to provide targeted technical assistance to ACOs that disproportionately serve beneficiaries with social risk factors to help improve quality.

As the Medicare Shared Savings Program grows, learning and diffusion program activities or other existing quality improvement mechanisms could establish a specific focus on helping to share and spread promising strategies for improving care and outcomes for beneficiaries with social risk factors. Lessons learned from the Pioneer ACO Model or other models and demonstrations that may benefit these beneficiaries should also be disseminated via learning networks to provide support for these groups. These efforts would support policy goals to improve quality and outcomes, and reduce disparities in care.

Delivery system transformation aims to move healthcare consumers and providers into alternative payment/delivery models that focus on person-centered, coordinated and comprehensive care. It could be argued that beneficiaries with social risk factors could receive better care in these models and providers that serve large shares of these consumers could improve their quality by being part of these systems. Therefore, lessons from the Medicare Shared Savings Program will also be important for understanding the potential performance and experience of providers serving beneficiaries with social risk factors in alternative payment models under MACRA and how these providers could be encouraged to join alternative payment models in the future.

CONSIDERATION 3: Consider developing demonstrations or models focusing on care innovations that may help achieve better outcomes for beneficiaries with social risk factors in ACOs.

In order to continue to achieve savings relative to benchmarks, ACOs will need to implement new strategies and innovations. The strategies learned from successful ACOs that may help optimally treat beneficiaries with social risk factors should be disseminated where feasible.

Additionally, much of this work is already ongoing at CMMI. Strategies suggested by the National Academies of Sciences, Engineering, and Medicine in their report summarized in Chapter 4, including the

importance of care coordination, population-based care, the use of comprehensive needs assessments, formation of collaborative partnerships with community organizations and home and community-based services providers, providing care continuity across settings, and engaging beneficiaries in their care, are among those used by ACOs currently and supported by many models and demonstrations at CMMI. Where successful, particularly for beneficiaries with social risk factors, these programs should be scaled more broadly. Further, there may be a role for specific demonstrations or models focused on beneficiaries with social risk factors in future ACO-based paradigms.

CONSIDERATION 4: Consider further research to examine the costs of caring for beneficiaries with social risk factors.

One final piece of information that could be critical for policy recommendations in the future would be to understand more about the true costs of achieving good outcomes for beneficiaries with social risk factors. Further research could examine how costs differ for beneficiaries with social risk factors and for ACOs that serve a high proportion of beneficiaries with social risk factors.

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CHAPTER 10: The Physician Value-Based Payment Modifier Program

In This Chapter:

- ***Is there a relationship between beneficiary social or medical risk and performance on the metrics that comprise the Physician Value-Based Payment Modifier program?***
- ***Is there a relationship between practice social or medical risk profile and performance on the metrics that comprise the program?***
- ***Are practices that serve a high proportion of socially or medically at-risk individuals more likely to receive penalties under this program?***
- ***What impact would policy options, including adjustment and stratification, have on practices' performance and bonuses or penalties?***

This chapter presents findings on the relationship between beneficiary or practice social or medical risk and performance under the Physician Value-Based Payment Modifier (VM) program.

Key Findings

Underlying Relationships

- Dually-enrolled and complex beneficiaries had higher readmission and ambulatory care-sensitive condition (ACSC) admission rates, even after adjustment for medical comorbidities and even within the same practice.
- Practices serving a high proportion of dually-enrolled or complex beneficiaries also had higher readmission and ACSC rates, even after adjustment for medical comorbidities and social risk factors. Practice effects were generally substantially smaller than the patient effects.
- Dually-enrolled beneficiaries had higher costs of care than other beneficiaries, even after risk adjustment and even within the same practices.
- Complex beneficiaries had lower costs of care than other beneficiaries, after accounting for medical risk and within the same practices.
- Practices serving a high proportion of dually-enrolled beneficiaries had similar or higher costs of care than other practices, after accounting for beneficiary dual enrollment. This was associated with both beneficiary and practice characteristics, although beneficiary effects were generally larger than practice effects.
- Practices serving a high proportion of complex beneficiaries had higher costs of care, even after accounting for beneficiary medical risk. This was primarily driven by practice effects.

Program Impacts

- Many practices did not successfully meet program requirements (failed to self-nominate for the PQRS as a group and report at least one measure, or failed to elect the PQRS administrative claims option) for the Physician VM Program. This was the most common reason for a downward adjustment in the program's first year. High-dual practices were twice as likely as other practices to fail to meet requirements for the program.
- High-dual practices were at higher risk of receiving a downward payment adjustment.
- High-complexity practices were at higher risk of receiving a downward payment adjustment.

Policy Simulations

- Adjusting readmission and ambulatory care-sensitive admission measures for dual enrollment had a negligible impact on payment adjustments.
- Adding medical risk adjustment to the ambulatory care-sensitive admission measures had a negligible impact on payment adjustments.
- Stratification equalized payment adjustments for high-dual versus other practices, but had a smaller effect on equalizing payment adjustments for high-complexity versus other practices.
- Adjusting cost measures for dual enrollment had little impact on payment adjustments.

Note: Since the VM program ends in 2018, strategies and considerations are provided to help with decision making for the Merit-based Incentive Payment System (MIPS), and generally are not feasible for implementation in VM given that timeframe.

Strategies and Considerations for Physician VM

SUMMARY OF STRATEGIES AND CONSIDERATIONS
STRATEGY 1: Measure and Report Quality for Beneficiaries with Social Risk Factors
CONSIDERATION 1: Consider enhancing data collection and developing statistical techniques to allow measurement and reporting of performance for beneficiaries with social risk factors on key quality and resource use measures.
CONSIDERATION 2: When feasible, consider developing and introducing a new measure or domain on Achieving Health Equity to MIPS to assess and reward physician practice efforts to reduce health disparities.
CONSIDERATION 3: Consider prospectively monitoring for potential unintended consequences in the current Physician VM program and in the MIPS program as it is implemented.
STRATEGY 2: Set High, Fair Standards for All Beneficiaries
CONSIDERATION 1: The measures used in the Physician VM Program should continue to be examined to determine if adjustment for social risk factors is appropriate.
CONSIDERATION 2: The ambulatory care-sensitive condition measures should be updated to account for medical risk.

CONSIDERATION 3: Program measures should be studied to determine whether differences in health status might underlie the observed relationships between social risk and performance, and whether better adjustment for health status might improve the ability to differentiate true differences in performance between practices.
STRATEGY 3: Reward and Support Better Outcomes for Beneficiaries with Social Risk Factors
CONSIDERATION 1: Consider providing additional payment adjustments for practices that disproportionately serve beneficiaries with social risk factors and achieve high quality, or specifically for achieving high quality in beneficiaries with social risk factors.
CONSIDERATION 2: Consider using existing or new quality improvement programs to provide targeted technical assistance to practices that disproportionately serve beneficiaries with social risk factors to help improve quality and ensure they can successfully participate in the reporting required for the MIPS program, or to assist in moving toward alternative payment model (APM) participation.
CONSIDERATION 3: Consider developing demonstrations or models focusing on care innovations that may help achieve better outcomes for beneficiaries with social risk factors.
CONSIDERATION 4: Consider further research to examine the costs of caring for beneficiaries with social risk factors and to determine whether current payments adequately account for these differences in care needs.

I. Introduction

A. Background

The Physician VM Program is a mandatory program that ties Medicare Physician Fee Schedule payments to the quality and costs of care delivered by physicians and other eligible professionals. Section 1848(p) of the Social Security Act, as added by section 3007 of the Affordable Care Act, requires the Secretary of the Department of Health and Human Services to "establish a payment modifier that provides for differential payment to a physician or a group of physicians under the fee schedule . . . based upon the quality of care furnished compared to cost." In the first year of the program, 2015, the Centers for Medicare & Medicaid Services (CMS) applied a payment adjustment – or a "value modifier" – to payments under the physician fee schedule for large group practices with 100 or more eligible practitioners (EPs). The value modifier quality tiering will apply to all physicians and groups of physicians beginning in 2017.

Performance assessment in the first year of the Physician VM Program was aligned with the pre-existing Physician Quality Reporting System (PQRS) Program, and included performance metrics across six quality domains and two cost domains (see the Appendix to this chapter for additional information). Practices were scored on a mix of mandatory and discretionary quality measures, and could choose to report these measures via group reporting options for registries and a web-based interface, or by electing a one-time reporting method for measures calculated using Medicare Part A and Part B claims.

Group practices subject to the VM in 2015 that failed to self-nominate for the PQRS as a group and report at least one measure, or failed to elect the PQRS administrative claims option, received an automatic -1 percent payment adjustment. Group practices subject to the VM in 2015 that successfully self-nominated for the PQRS as a group and reported at least one measure, or elected the PQRS administrative claims option, had two options – they could elect to receive no adjustment (no matter what their performance) or to put their payments at risk based on quality and cost performance. Groups that selected the latter "quality tiering" option could receive either a positive, neutral, or negative adjustment based on their performance on measures of quality and cost. For example, groups with high costs and low quality received a negative payment adjustment, while groups with high quality and low costs received a positive adjustment (Table 10.1). The payment adjustments were applied to all of a practice's physician payments under the Medicare Physician Fee Schedule in the affected payment year.

Table 10.1. Value Modifier, 2015 Payment Adjustment Year

	Low Quality	Average Quality	High Quality
Low Cost	0.0%	+1.0x%*	+2.0x%*
Average Cost	-0.5%	0.0%	+1.0x%*
High Cost	-1.0%	-0.5%	0.0%
* "x" refers to a payment adjustment factor used to ensure budget neutrality across the program			

Note: Throughout this chapter, years refer to the payment year of the program, unless otherwise specified.

The Physician VM Program will continue to expand through 2017 and sunsets in 2018 (its last payment year), applying quality tiering to smaller group practices and then solo practitioners and non-physician eligible professionals. The program increases the size of the adjustments to a maximum of +/- 4 percent[j] in 2017 and 2018, and requires quality tiering for a growing number of practices rather than making it optional, as it was in the first year. As the program expands, some measures are slated to be added starting in 2016, including the Medicare Spending per Beneficiary (MSPB) measure as well as patient experience measures from the 2016 Consumer Assessment of Healthcare Providers and Systems (CAHPS) for PQRS survey for groups that elect to include the results of their CAHPS in the calculation of their VM. Measurement methodology will be updated as well, for example adjusting cost measures for specialty mix starting in 2016, and increasing minimum case counts for certain measures to improve reliability, as the Physician VM Program expands to include small physician groups and solo practices.

In 2018, the Physician VM Program will sunset and CMS will launch the Merit-Based Incentive Payment System (MIPS), a new program that will combine elements of the Physician VM Program, the Physician Quality Reporting System, and the Medicare Electronic Health Record Incentive Program.

B. Existing Research on Social Risk Factors and the Physician VM Program

The Physician VM Program is unique in its scale and scope, and thus in its potential impact on beneficiaries and practices. There is no prior experience with a mandatory physician value-based purchasing program. Furthermore, as the Physician VM Program is relatively new, there is limited prior research on the relationship between social risk and performance under this program. However, there is a significant body of work examining the relationship between social risk factors and performance on many of the metrics that underlie this program.

Prior research has shown that physician organizations located in areas of lower socioeconomic status (SES) perform worse in pay-for-performance programs than those in higher SES areas.[1] Similarly, physician panels that have a higher proportion of minority beneficiaries have been found to have lower quality scores.[2] Thus, there is concern that physician practices that serve a high proportion of beneficiaries with social risk factors may be at risk of poor performance under the Physician VM Program. Differences in practice performance may be due to poor quality physicians and other practitioners (whether due to resources, structural capabilities, or otherwise), or "practice factors." Differences in practice performance may also be due to the challenges of caring for beneficiaries with social risk factors (whether due to weaker social supports, stigma of social risk, or otherwise), or "patient factors" (regardless of provider).[3-5]

In terms of the Physician VM Program's mandatory quality measures, prior work has demonstrated that beneficiaries with social risk factors may perform poorly on many of them. For example, dually-enrolled,[6,7] Black,[6,8] and Hispanic[9] beneficiaries are more likely to be readmitted following a hospitalization, and these socially at-risk groups also have higher rates of ambulatory care-sensitive

[j] Because of the adjustment factor, the maximum upward adjustment is +4x%.

admissions.[10-12] Performance on the program's optional quality metrics has also been associated with social risk factors.[13-15] In terms of resource use, dually-enrolled beneficiaries have significantly higher costs of care than non-dually-enrolled beneficiaries.[16,17]

C. Limitations

The results of the analyses in this chapter should be interpreted in light of their potential limitations. First, this analysis examined the performance of all VM-eligible practices in the program's first year, the time period for which data were available at the time the Report was being completed. Therefore, upward and downward adjustments are simulated for the 84% of VM-eligible practices that successfully self-nominated and reported, or elected the administrative claims option, but did not elect quality tiering. These analyses anticipate the second year of the program, when quality tiering will be required. Second, these results may not apply to smaller practices, since only physician group practices with at least 100 EPs were subject to the VM in 2015. Finally, as outlined in Chapter 2, these analyses examine social risk factors that are readily and reliably identified using Medicare claims. Further work may be necessary to better characterize social risk using more nuanced data. Results presented here will primarily focus on dual enrollment (including both full and partial dual enrollment) as a marker of poverty. However, one potential mechanism underlying the relationships seen between dual and poor outcomes may be that dually-enrolled beneficiaries are typically sicker, with worse functional status and higher levels of medical complexity, than the general Medicare population.[18] Therefore, analyses examining medical complexity are included in this chapter as well. Analyses of other social risk factors are included in the Appendix to this chapter.

D. Framework for the Chapter: Analytic Findings, Policy Simulations, Strategies, and Considerations

The remainder of this chapter is structured as follows. First, it describes underlying relationships between social risk and medical risk and performance on the measures contained in the VM program. Next, it examines the performance of providers serving socially at-risk or medically complex beneficiaries on these measures, and then the composite performance of these providers under the VM program penalty and bonus scheme. Following these analytic sections, a series of policy simulations are presented, focusing on adjustment, stratification, and rewarding improvement. Finally, strategies and considerations are presented, using the strategic framework outlined in Chapter 1: 1) measure and report quality for beneficiaries with social risk factors; 2) set high, fair standards for all beneficiaries; and 3) reward and support better outcomes for beneficiaries with social risk factors. These three strategies build on each other to address social risk in Medicare payment programs.

II. Beneficiary and Practice Characteristics

A. Beneficiary Characteristics

On average, there were 5,138 fee-for-service Medicare beneficiaries attributed to each of 1,010 VM-eligible practices with 100+ EPs. As in the Medicare Shared Savings Program, attribution is based on the plurality of primary care services.

Among beneficiaries attributed to VM-eligible practices, dually-enrolled beneficiaries were more likely to be under 65, Black, Hispanic, and disabled, and were twice as likely as non-dually-enrolled beneficiaries to be in the highest quartile of medical complexity among all fee-for-service Medicare beneficiaries (Table 10.2). Medically complex beneficiaries were more likely to be older, Black, dually-enrolled, and have qualified for Medicare based on the presence of a disability.

Table 10.2. Beneficiary characteristics by social and medical risk categories

Beneficiary Characteristics	Dually-enrolled	Non-dually-enrolled	High Complexity*	Low Complexity
Number of Attributed Beneficiaries	978,277	4,210,710	1,416,683	3,664,902
Age Group, by years				
0-64	55%	13%	18%	19%
65-74	21%	47%	27%	48%
75-84	15%	29%	31%	25%
85+	10%	12%	23%	8%
Female	62%	56%	56%	58%
Race				
Black	23%	7%	12%	9%
Hispanic	9%	3%	4%	4%
Other	68%	90%	84%	87%
Dually-enrolled	100%	0%	29%	15%
High Complexity	42%	24%	100%	0%
Disability as Reason for Medicare Entitlement	62%	14%	29%	21%
Low Income	65%	45%	51%	46%
Rural	18%	17%	16%	17%
HCC Count				
Unknown	2%	2%	2%	2%
0	25%	37%	0%	49%
1	22%	25%	4%	33%
2	17%	15%	16%	15%
3 - 5	23%	17%	59%	3%
6 - 9	8%	4%	18%	4%
10+	2%	1%	3%	1%

HCC=Hierarchical Condition Categories.
* High complexity is defined as the top quartile of HCC risk scores for all fee-for-service Medicare beneficiaries nationwide. Definitions of other patient characteristics are included in the methods appendix. Of note, less than 3% of attributed beneficiaries lacked adequate information to calculate HCC risk scores, and thus could not be classified as high complexity or not high complexity. All beneficiaries with unknown HCC risk score are dropped from both high-complexity and low-complexity columns in this table, since they could not be classified.

B. Practice Characteristics

Practices were categorized by their proportion of at-risk beneficiaries. High-dual practices were defined as those in the top quintile when ranked by the proportion of attributed beneficiaries who were dually enrolled. High-complexity practices were defined as those whose attributed beneficiaries had an average Hierarchical Condition Category (HCC) risk score in the top quartile of HCC risk scores among all fee-for-service Medicare beneficiaries. The proportion of beneficiaries with high medical and social risk varied widely between VM-eligible practices (Figure 10.1 and Figure 10.2, both displaying only VM-eligible practices with at least one attributed beneficiary).

Figure 10.1. Distribution of Dually-Enrolled Patients by Practice

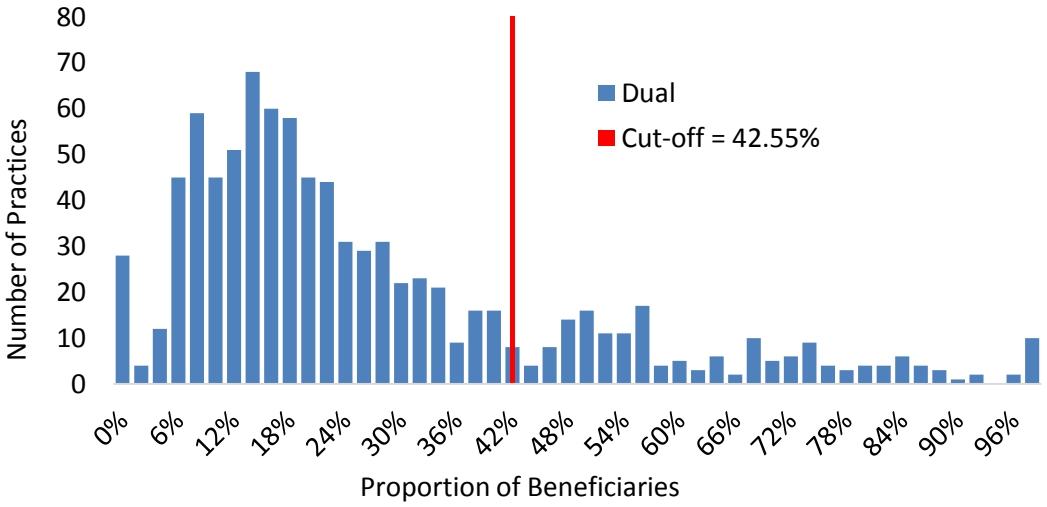
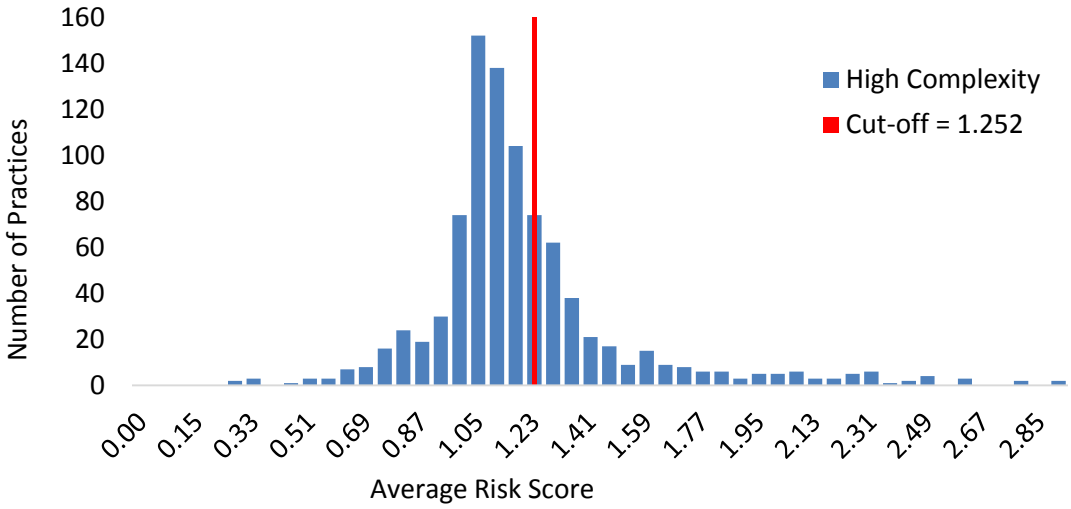


Figure 10.2. Distribution of Complex Beneficiaries by Practice



The characteristics of beneficiaries seen at high-dual and high-complexity vs. other practices differed substantially. High-dual practices were more likely to serve Black, Hispanic, and disabled beneficiaries

with relatively lower income and higher medical complexity (Table 10.3). Results were similar for high-complexity practices. High-dual practices also had more than three times the proportion of dually-enrolled beneficiaries as other practices (59% vs. 17%), and slightly more complex beneficiaries than other practices (36% vs. 27%).

Table 10.3. Beneficiary Characteristics at Practices Caring for a High Proportion of Dually-Enrolled or Complex Beneficiaries, Compared to Other Practices

Beneficiary Characteristics	All VM eligible Practices	Dual Enrollment		Complexity	
		High	Other	High	Other
No. of Attributed Beneficiaries	5,189,000	284,270	4,904,730	696,881	4,492,199
Age Group, years					
0 - 64	20%	43%	19%	29%	19%
65 - 74	42%	29%	43%	35%	43%
75-84	26%	17%	26%	23%	26%
85 +	12%	10%	12%	13%	12%
Female	57%	56%	57%	57%	57%
Race					
Black	10%	32%	9%	20%	9%
Hispanic	4%	11%	3%	6%	3%
Dually-enrolled	19%	59%	17%	33%	17%
High Complexity	27%	36%	27%	37%	26%
Disabled	23%	49%	22%	32%	22%
ZCTA Level Income					
Unknown	3%	4%	3%	3%	3%
0 - 20k	0%	2%	0%	1%	0%
20k - 25k	1%	7%	1%	3%	1%
25k - 30k	3%	7%	2%	5%	2%
30k - 40k	14%	21%	14%	17%	14%
>40k	79%	60%	80%	71%	80%
Rural	17%	10%	17%	10%	18%

Note: All p-values<0.05. High-dual practices are those in the highest quintile after ranking practices by proportion of dual patients; other practices are those in the bottom four quintiles. High complexity practices' average HCC scores were at or above the 75th percentile of HCC scores among all fee-for-service Medicare beneficiaries; other practices had average HCC scores below the 75th percentile of HCC scores among all fee-for-service Medicare beneficiaries.

Practice characteristics also differed substantially. Physicians at high-dual practices were less likely to have met Stage 1 Meaningful Use requirements, and their practices were more likely to be owned by a hospital (Table 10.4). Results were similar for high-complexity practices. Among those practices that were high-dual, 53% were also high-complexity practices.

Table 10.4. Characteristics of Physicians and Practices Caring for a High Proportion of Dually-Enrolled or Complex Beneficiaries, Compared to Other Physicians and Practices

Eligible Practitioner Characteristics	VM Eligible Practices	Dual Enrollment		Complexity	
		High	Other	High	Other
No. of Physicians	n=301,655	n=45,078	n=256,677	n=80,185	n=221,470
Female	44%	**46%**	**43%**	44%	44%
Age Group, years					
<40	39%	**38%**	**39%**	**41%**	**38%**
41-50	27%	**26%**	**28%**	**27%**	**28%**
51-60	23%	**23%**	**23%**	**21%**	**23%**
61-70	10%	**11%**	**9%**	**9%**	**10%**
71+	2%	**3%**	**1%**	**2%**	**1%**
Specialty					
Physician	60%	**59%**	**64%**	**64%**	**59%**
Primary care	19%	**18%**	**21%**	**25%**	**17%**
Medical specialty	25%	**22%**	**27%**	**22%**	**25%**
Surgical specialty	9%	**8%**	**10%**	**10%**	**9%**
Ob/gyn	4%	**3%**	**4%**	**3%**	**4%**
Psychiatry	3%	**8%**	**3%**	**4%**	**3%**
Non-physician	24%	**25%**	**23%**	**20%**	**26%**
Other	15%	**16%**	**13%**	**15%**	**16%**
Meaningful Use (Stage 1)*	25%	**10%**	**29%**	**23%**	**26%**
Practice Characteristics					
Physicians (n, mean)	298	**247**	**309**	321	290
100-149	39%	**36%**	**40%**	39%	40%
150-199	20%	**22%**	**20%**	18%	21%
200-299	16%	**16%**	**17%**	15%	17%
300-399	8%	**13%**	**7%**	9%	7%
400-499	3%	**3%**	**3%**	2%	3%
500+	13%	**10%**	**14%**	17%	12%
Specialty Mix					
All primary care	0%	0%	0%	0%	0%
All specialty	11%	8%	11%	4%	13%
Multi-specialty	89%	92%	88%	96%	86%
Ownership Type					
Any Hospital	13%	**24%**	**11%**	13%	13%
No Hospital	87%	**76%**	**89%**	87%	87%

Boldface font indicates $p<0.05$, testing for difference between high social risk vs. other. Ob/gyn: obstetrics and gynecology. Primary care is general practice, pediatrics, geriatric medicine, internal medicine or family practice. A list of the types of providers in the non-physician and other categories is included in the Supplementary Material. All specialty indicates the practice is comprised entirely of providers who are not primary care physicians. *Does not include Medicaid Meaningful Use.

III. Beneficiary Social and Medical Risk Factors and VM Performance Measures

Of the multiple quality metrics on which practices are evaluated, three are mandatory: all-condition readmissions and two composite ambulatory-care sensitive condition (ACSC) measures. Of note, the all-condition readmissions measure will apply only to groups with 10 or more eligible professionals starting in 2017. These mandatory quality measures are claims-based outcome metrics with patient-level data and thus can be analyzed to determine any underlying relationships between social or medical risk and these clinical outcomes. The five cost measures included in the first year of the program were all mandatory and claims-based.

A. Readmissions

To determine whether dually-enrolled or complex beneficiaries have higher readmission rates than other beneficiaries, regression models were constructed. These models included a random effect for practice, in order to isolate the within-practice effect of dual enrollment and complexity. Models were first run without adjustment for age, gender, and comorbidities, and subsequently with these elements, following measure specifications.

Dually-enrolled and complex beneficiaries were more likely to be readmitted to the hospital, even after controlling for differences in patient risk and practice selection. For example, within 30 days of discharge for a surgical/gynecological admission, 16.3% of dually-enrolled beneficiaries were re-admitted compared to 10.2% of non-dually-enrolled beneficiaries (Table 10.5). This difference might be explained by a variety of factors, including differences in patient factors (e.g., co-morbidities, resources at home), and practice factors (e.g., dually-enrolled beneficiaries may disproportionately be seen by poor quality practices). However, compared to non-dually-enrolled beneficiaries seen in the same practice, dually-enrolled beneficiaries still had 58% greater odds of being re-admitted after a surgical/gynecological admission. Even after risk-adjustment, dually-enrolled beneficiaries had 20% greater odds of readmission than non-dually-enrolled beneficiaries in the same practice.

Findings were similar for the other cohorts, with fully-adjusted within-practice odds ratios for readmission from 1.11 to 1.20 (surgical, medical, cardiorespiratory, cardiology, and neurology, Table 10.5). Similar patterns were evident for complex beneficiaries. These findings suggest that patient factors contribute to differential readmission rates between beneficiaries with versus without social and medical risk factors.

Table 10.5. Odds of Readmission for Dually-Enrolled or Complex Beneficiaries, Stratified by Type of Index Admission

Risk Factor	Without Risk-Adjustment				Risk-Adjusted
	Raw rate		Raw Odds Ratio	Random Effects (within-practice) Odds Ratio	Random Effects Odds Ratio with risk adjustment
	High-Risk (dual/complex)	Non-High-Risk (Ref.)			
	Surgery/Gynecology				
Dually-enrolled	16.3%	10.2%	**1.72**	**1.58**	**1.20**
Complex	15.8%	7.6%	**2.30**	**2.22**	**1.35**
	Medicine				
Dually-enrolled	19.4%	15.7%	**1.30**	**1.24**	**1.11**
Complex	19.1%	11.8%	**1.77**	**1.73**	**1.22**
	Cardiorespiratory				
Dually-enrolled	22.7%	17.5%	**1.38**	**1.33**	**1.18**
Complex	20.9%	12.7%	**1.82**	**1.79**	**1.26**
	Cardiovascular				
Dually-enrolled	17.4%	13.0%	**1.41**	**1.36**	**1.16**
Complex	16.8%	9.8%	**1.87**	**1.85**	**1.24**
	Neurology				
Dually-enrolled	14.8%	11.6%	**1.33**	**1.28**	**1.14**
Complex	14.4%	9.6%	**1.58**	**1.55**	**1.14**

All bolded odds ratios are significant at $p<0.05$.
These analyses were based on all VM-eligible practices. Regressions included either dual or complex, but not both in the same model.
Details about risk-adjustment for the readmissions measure can be found at:
http://www.qualityforum.org/WorkArea/linkit.aspx?LinkIdentifier=id&ItemID=69324

B. Ambulatory Care-Sensitive Conditions

The ambulatory care sensitive condition (ACSC) measures track preventable admissions, or admissions for acute and chronic conditions that are ideally treated in outpatient settings. Here too, beneficiaries with high medical or social risk had worse outcomes than other beneficiaries. For example, admissions for any of several acute conditions (i.e., bacterial pneumonia, urinary tract infection, dehydration) per 1,000 attributed beneficiaries were 32.06 for dually-enrolled beneficiaries, but only 17.28 for non-dually-enrolled beneficiaries (Table 10.6). On average, dually-enrolled beneficiaries had 73% higher odds of admission for these acute conditions than non-dually-enrolled beneficiaries in the same practice. After further accounting for differences in risk between dually-enrolled beneficiaries and non-dually-enrolled beneficiaries, dually-enrolled beneficiaries had more than twice the odds of being admitted for an acute condition than non-dually-enrolled beneficiaries. Results were similar across conditions.

For most conditions, differences were even larger when comparing complex beneficiaries to other beneficiaries in the same practice. For example, admissions for any of several acute conditions (i.e., bacterial pneumonia, urinary tract infection, dehydration) per 1,000 attributed beneficiaries were 47.33 for complex beneficiaries, but only 9.84 for patients that were not complex. On average, complex beneficiaries had more than four times the odds of admission for these acute conditions than non-dual patients in the same practice. After further accounting for differences in risk between complex beneficiaries and other patients, complex beneficiaries still had almost four times the odds of being admitted for an acute condition than patients who were not complex.

These findings suggest that, even within the same practice, beneficiaries with high medical and social risk are more likely to be admitted for the target conditions than other beneficiaries.

Table 10.6. Risk-Adjusted Odds of Admission for Acute and Chronic Ambulatory Care Sensitive Conditions (ACSCs) for Dually-enrolled Eligible or Complex Beneficiaries

Risk Factor	Without Risk-Adjustment				Risk-Adjusted
	Raw ACSC Admissions per 1,000 Beneficiaries		Raw Odds Ratio	Random Effects (within-practice) Odds Ratio	Random Effects Odds Ratio with Risk Adjustment
	High Risk	Other (Reference)			
	Acute Composite				
Dually-enrolled	32.06	17.28	1.88	**1.73**	**2.09**
Complex	47.45	9.84	5.01	**4.74**	**3.89**
	Bacterial Pneumonia				
Dually-enrolled	15.05	8.78	1.72	**1.61**	**2.03**
Complex	24.13	4.69	5.25	**5.07**	**4.22**
	Urinary Tract Infection				
Dually-enrolled	11.19	5.17	2.18	**1.95**	**2.30**
Complex	15.21	2.98	5.16	**4.74**	**3.68**
	Dehydration				
Dually-enrolled	5.86	3.31	1.78	**1.66**	**1.80**
Complex	8.21	2.15	3.85	**3.66**	**3.22**

All bolded ORs are significant at p<0.05. COPD=chronic obstructive pulmonary disease. These analyses were based on all VM-eligible practices. Regressions included either dual or complex, but not both in the same model. Risk adjustment includes age category and gender, and is outlined in more detail in the Appendix to this chapter.

Table 10.6 (continued). Risk-Adjusted Odds of Admission for Acute and Chronic Ambulatory Care Sensitive Conditions (ACSCs) for Dually-enrolled Eligible or Complex Beneficiaries

Risk Factor	Without Risk-Adjustment				Risk-Adjusted
	Raw ACSC Admissions per 1,000 Beneficiaries		Raw Odds Ratio	Random Effects (within-practice) Odds Ratio	Random Effects Odds Ratio with Risk Adjustment
	High Risk	Other (Reference)			
	Chronic Composite				
Dually-enrolled	103.79	58.12	1.88	**1.74**	**1.68**
Complex	112.11	32.49	3.76	**3.66**	**3.57**
	Diabetes Composite				
Dually-enrolled	41.41	12.47	3.42	**3.02**	**1.87**
Complex	32.19	9.60	3.43	**3.19**	**3.53**
	COPD or Asthma				
Dually-enrolled	87.85	57.07	1.59	**1.50**	**1.62**
Complex	88.78	40.77	2.92	**2.27**	**2.33**
	Heart Failure				
Dually-enrolled	116.18	103.19	1.14	**1.10**	**1.14**
Complex	115.09	84.17	1.42	**1.40**	**1.36**

All bolded ORs are significant at p<0.05. COPD=chronic obstructive pulmonary disease. These analyses were based on all VM-eligible practices. Regressions included either dual or complex, but not both in the same model. The risk-adjustment variables are age category and sex and are presented in more detail in the Appendix to this chapter.

C. Total and Condition-Specific per Capita Costs of Care

The "total per capita costs of care" measure captures annual risk-adjusted, price-standardized Medicare Parts A and B spending for attributed beneficiaries. The "condition-specific per capita costs of care" measure captures this same spending for beneficiaries with a given chronic condition. Dually-enrolled and complex beneficiaries had higher per capita costs of care than other beneficiaries. For example, total per capita costs were almost $7,000 higher for dual than non-dually-enrolled beneficiaries ($17,465 vs. $10,739) (Table 10.7).

The Physician VM Program's risk-adjustment model substantially reduced the price-standardized differences in costs between high-risk and other beneficiaries. Of note, the HCC risk score used in the VM program's risk-adjustment model includes Medicaid enrollment.

In a random effects model that included Physician VM Program risk-adjustment variables (HCC risk score, HCC risk score squared, ESRD) and the primary independent predictor of dual status, total per capita costs were +$725 higher for dual compared to non-dual patients. In a separate random effects model that included Physician VM Program risk-adjustment variables and the primary independent

predictor of complexity (i.e., high-complexity patient vs. not), total per capita costs were -$338 lower for high-complexity compared to other patients. Please see **Appendix** for methodological details.

Table 10.7. Total and Condition-Specific Costs of Care for Dually-Enrolled or Complex Beneficiaries

Risk Factor	Costs				
	Unadjusted, Average, Standardized				With Physician VM Program Risk - Adjustment
	High-Risk Beneficiaries	Non-High-Risk Beneficiaries	Raw Difference	Coefficient for either Dual or Complex*	Coefficient for either Dual or Complex*
	Total Per Capita Costs				
Dually-enrolled	$17,465	$10,739	$6,726	**$4,729**	**$725**
Complex	$22,554	$7,605	$14,949	**$12,865**	**-$338**
	Heart Failure Per Capita Costs				
Dually-enrolled	$34,809	$24,778	$10,031	**$7,516**	**$2,979**
Complex	$29,865	$22,065	$7,800	**$6,140**	**-$4,341**
	Diabetes Per Capita Costs				
Dually-enrolled	$22,533	$13,505	$9,028	**$6,919**	**$1,972**
Complex	$24,112	$9,302	$14,809	**$12,895**	**-$630**
	COPD Per Capita Costs				
Dually-enrolled	$31,455	$22,881	$8,574	**$6,412**	**$2,388**
Complex	$31,222	$17,231	$13,991	**$12.086**	**-$1,318**
	CAD Per Capita Costs				
Dually-enrolled	$27,028	$16,208	$10,820	**$8,284**	**$2,963**
Complex	$25,172	$12,112	$13,060	**$11,118**	**-$782**

*From random effects model

The Physician VM Program uses price-standardized dollars and adjusts for HCC risk score (which includes dual status), HCC risk score squared, and ESRD. Bold-faced betas are significant at $p<0.05$. CAD=coronary artery disease; COPD=chronic obstructive pulmonary disease; DM=diabetes mellitus; HF=heart failure; HCC= hierarchical condition category; and ESRD=end-stage renal disease. These analyses are based on U.S. practices of any size included in the VM database, with at least one attributed beneficiary. Regressions included either dual or complex, but not both in the same model. A high-complexity patient is defined as one with an HCC risk score in the top quartile of HCC risk scores among all fee-for-service Medicare beneficiaries nationwide.

IV. Practice Social Risk and VM Performance

A. Readmissions

To quantify how much of a practice's performance was associated with practice versus beneficiary characteristics, two additional analyses were performed. The first compared beneficiaries seen at practices that serve a high proportion of dually-enrolled (or complex) beneficiaries (i.e., "high-dual" or "high-complexity" practices) to beneficiaries at other practices using regression models with a random effect for practice. Next, beneficiary factors were also added to the model, to determine whether the practice effect was driven by population, or if it was independent of beneficiaries' social and medical risk (Table 10.8). These analyses showed that practice effects were partially but not fully driven by the population of beneficiaries served.

The first comparison showed that beneficiaries cared for at high-dual practices had 29% higher risk-adjusted odds of being readmitted to the hospital within 30 days of a surgical/gynecological admission; this dropped to 23% higher odds after accounting for individual beneficiaries' dual enrollment. These results suggest that both beneficiary and practice factors contribute to the relatively higher readmission rates at high-dual practices. Results were similar for high-complexity practices.

Table 10.8. Practice Factors in Readmissions

Risk Factor	Risk-Adjusted Odds of Readmission for a Beneficiary at a High-Risk Practice	Risk-Adjusted Odds of Readmission for a Beneficiary at a High-Risk Practice, additionally Adjusting for Dual Enrollment or Complexity
	Surgery/Gynecology	
High-Dual Practice	**1.29**	**1.23**
Complex Practice	**1.22**	**1.21**
	Medicine	
High-Dual Practice	**1.14**	**1.10**
Complex Practice	**1.18**	**1.17**
	Cardiorespiratory	
High-Dual Practice	**1.24**	**1.18**
Complex Practice	**1.20**	**1.19**
	Cardiovascular	
High-Dual Practice	**1.24**	**1.19**
Complex Practice	**1.19**	**1.18**
	Neurology	
High-Dual Practice	**1.28**	**1.24**
Complex Practice	**1.22**	**1.21**

Random effects models were used to generate odds ratios (ORs). Bolded betas are significant at $p<0.05$. Details about risk-adjustment for the readmissions measure can be found at: http://www.qualityforum.org/WorkArea/linkit.aspx?LinkIdentifier=id&ItemID=69324

B. Ambulatory Care-Sensitive Conditions

The analyses described in the last section were repeated for acute and chronic ACSCs. Again, high-dual and high-complexity practices each generally had worse outcomes than other practices. For example, beneficiaries cared for at high-dual practices had 28% higher odds of being admitted for one of the acute conditions (i.e., bacterial pneumonia, urinary tract infection, and dehydration), than beneficiaries cared for at other practices (Table 10.9). However, when both beneficiary and practice factors were included in the same model (e.g., dual enrollment status and high-dual practice status), beneficiaries seen at high-dual practices no longer had higher rates of admission for most ACSCs.

Separate models were run to examine complexity. For complex practices, the odds of admission tended to drop markedly after adjusting for medical complexity, but remained significant in all cases. Also, in almost all cases the practice effects (high-complexity practice) were smaller than beneficiary effects (complex patient) (compare Table 10.6 and Table 10.9). Together, these analyses suggest that beneficiary factors, rather than practice factors, somewhat better explain the higher admission rates seen for dually-enrolled and complex beneficiaries.

Table 10.9. Practice Factors in ACSCs

Risk Factors	Risk-Adjusted Odds of Admission for a Beneficiary at a High-Risk Practice	Risk-Adjusted Odds of Admission for a Beneficiary at a High-Risk Practice, additionally Adjusting for Dual Enrollment or Complexity of Patient
	Acute Composite	
High-Dual Practice	**1.28**	1.00
Complex Practice	**1.77**	**1.46**
	Bacterial Pneumonia	
High-Dual Practice	**1.21**	0.95
Complex Practice	**1.54**	**1.27**
	Urinary Tract Infection	
High-Dual Practice	**1.45**	1.09
Complex Practice	**1.85**	**1.57**
	Dehydration	
High-Dual Practice	**1.24**	1.03
Complex Practice	**1.82**	**1.55**

Random effects models were used to generate odds ratios (ORs). Bolded betas are significant at $p<0.05$. COPD=chronic obstructive pulmonary disease. These analyses are based only on VM-eligible practices. Regressions included an indicator for either high-dual or high-complexity practice, but not both in the same model. Risk adjustment includes age category and sex.

Table 10.9 continued. Practice Factors in ACSCs

Risk Factors	Risk-Adjusted Odds of Admission for a Beneficiary at a High-Risk Practice	Risk-Adjusted Odds of Admission for a Beneficiary at a High-Risk Practice, additionally Adjusting for Dual Enrollment or Complexity of Patient
	Chronic Composite	
High-Dual Practice	**1.24**	1.06
Complex Practice	**1.54**	**1.35**
	Diabetes Composite	
High-Dual Practice	**1.38**	**1.17**
Complex Practice	**1.71**	**1.49**
	COPD or Asthma	
High-Dual Practice	**1.33**	**1.15**
Complex Practice	**1.36**	**1.25**
	Heart Failure	
High-Dual Practice	**1.14**	**1.10**
Complex Practice	**1.18**	**1.16**

Random effects models were used to generate odds ratios (ORs). Bolded betas are significant at $p<0.05$. COPD=chronic obstructive pulmonary disease. These analyses are based only on VM-eligible practices. Regressions included an indicator for either high-dual or high-complexity practice, but not both in the same model. Risk adjustment includes age category and sex.

C. Total and Condition-Specific per Capita Costs of Care

High-dual practices generally had similar costs of care than non-high-dual practices after risk adjustment (Table 10.10). When both patient (i.e., dual enrollment) and practice factors (i.e., high-dual practice) were accounted for, most patterns were unchanged.

Separate models were run to examine complexity. High-complexity practices had higher costs than other practices. When both patient (i.e., complex) and practice factors (i.e., high-complexity practice) were accounted for, results were largely unchanged. Please see **Appendix** for methodological details.

These results for total and condition-specific per capita costs of care measures suggest that the poorer performance of high-complexity practices on cost measures is driven primarily by practice factors.

Table 10.10. Practice Factors in Per Capita Cost Measures

Risk Factors	Difference in Average Practice-level Risk-Adjusted Costs , for a High-Risk vs. Other Practice	Difference in Average Practice-level Risk-Adjusted Costs, after additionally Adjusting for Dual Status or Complexity of Patient
	Total	
High-Dual Practice	-$246	$687
Complex Practice	**$3,204**	**$3,204**
	HF	
High-Dual Practice	**$2,413**	**$668**
Complex Practice	**$6,981**	**$6,951**
	Diabetes	
High-Dual Practice	**$1,700**	$625
Complex Practice	**$4,471**	**$4,471**
	COPD	
High-Dual Practice	**$2,859**	**$1,390**
Complex Practice	**$6,611**	**$6,604**
	CAD	
High-Dual Practice	**$2,349**	$893
Complex Practice	**$6,254**	**$6,256**

Bolded betas are significant at p<0.05. CAD=coronary artery disease; COPD=chronic obstructive pulmonary disease; DM=diabetes mellitus; HF=heart failure. The risk adjustments are done based on US practices of any size included in the VM database, with at least one attributed beneficiary. The coefficients are from practice-level regressions using only VM-eligible practices meeting minimum reporting requirements, and are not weighted for number of attributed beneficiaries. The Physician VM Program uses price-standardized dollars and adjusts for HCC risk score (which includes dual status), HCC risk score squared, and ESRD.

V. Impact of Physician VM Program on Providers Serving Populations with High Social or Medical Risk

A. Participation

The VM program applied to all physician groups with 100 or more eligible professionals in 2015. In order to avoid the automatic downward adjustment for failure to meet minimum reporting requirements, large groups were required to register for one of the PQRS group practice reporting options and successfully report on a minimum number of performance metrics, or elect the one time administrative claims based option for the first year of the program. Groups could also elect to be subject to quality tiering which would allow their physician fee schedule payments to be adjusted based on their quality and cost performance. Among all VM eligible practices, fewer than half (48.4%) of all top-dual practices registered and met the minimum reporting requirement, while over three-quarters (76.4%) of non-high-dual VM eligible practices registered and met the minimum reporting requirement. High-complexity practices participated in the Physician VM Program at almost the same rates as other practices (62.0% vs. 72.5%). In the first year of the Physician VM Program, practices that did not self-nominate for the

PQRS as a group and report at least one measure, or elect the PQRS administrative claims option received an automatic -1% downward adjustment.

B. Measure and Domain Performance in Practices Meeting Reporting Requirements

For those practices that self-nominated for the PQRS as a group and reported at least one measure, or elected the PQRS administrative claims option, high-dual practices had relatively worse performance on the all-cause hospital readmission measure and on acute ACSC measures (Table 10.11). Quality results were similar for complex practices. In terms of costs, high-dual practices were as costly as other practices, and complex practices were more costly than other practices.

Of note, in the tables below, higher VM quality scores indicate better performance (i.e., higher quality), and lower VM cost scores indicate better performance (i.e., lower cost).

Table 10.11. Practice-Level Performance on Mandatory Quality and Cost Measures, Stratified by Proportion of Dually-Enrolled or Complex Beneficiaries

Measure Type	Description	Dual Enrollment		Complexity	
		High	Other	High	Other
Quality Measures	Readmissions, Raw Rate	**16.4%**	**15.4%**	**16.4%**	**15.3%**
	Readmissions, Score (higher is better)	**0.05**	**0.69**	**0.01**	**0.81**
	Acute ACSC, Raw Rate	**10.2%**	**7.2%**	**10.8%**	**6.7%**
	Acute ACSC, Score (higher is better)	**-0.28**	**0.18**	**-0.37**	**0.27**
	Chronic ACSC, raw rate	**62.9%**	**69.2%**	**65.8%**	**69.2%**
	Chronic ACSC, Score (higher is better)	**-0.34**	**-0.56**	**-0.43**	**-0.568**
Per Capita Cost Measures	Total, $	$10,363	$10,316	**$12,834**	**$9,511**
	Total, score (lower is better)	0.18	0.15	**1.76**	**-0.37**
	HF, $	$27,730	$25,479	**$30,576**	**$24,238**
	HF, Score (lower is better)	0.34	-0.1**0**	**0.91**	**-0.35**
	DM, $	$16,192	$14,820	**$18,154**	**$13,989**
	DM, Score (lower is better)	0.70	0.15	**1.49**	**-0.18**
	COPD, $	$26,392	$24,1610	**$29,225**	**$22,937**
	COPD, score (lower is better)	0.60	0.10	**1.23**	**-0.17**
	CAD, $	$19,293	$17,571	**$22,188**	**$16,393**
	CAD, Score (lower is better)	0.71	0.13	**1.67**	**-0.26**

All bolded differences are significant at p<0.05. Readmissions are all-cause readmissions. For dual enrollment, high refers to practices in the top quintile of proportion of dually-enrolled beneficiaries. For complexity, high refers to practices for which the average HCC risk score among attributed beneficiaries is in the top quartile of HHC risk scores among all fee-for-service Medicare beneficiaries. This table shows results for VM-eligible practices meeting minimum program requirements. ACSC=ambulatory care-sensitive conditions; CAD=coronary artery disease; COPD=chronic obstructive pulmonary disease; DM=diabetes mellitus; HF=heart failure

Individual measures based on at least 20 eligible beneficiaries are rolled up into quality and cost domains. High-dual practices performed worse in the clinical process/effectiveness, patient safety, and care coordination domains (Table 10.12); complex practices performed more poorly on clinical process/effectiveness, patient safety, and care coordination. High-dual practices did not have higher costs than other practices; high-complexity practices had worse performance in both cost domains.

Table 10.12. Practice-level Performance on Cost and Quality Domains and Composites, Stratified by High-Dual or High-Complexity Practice vs. Other Practice

Measure Type	Description	Dual Enrollment		Complexity	
		High	Other	High	Other
Quality Domains (high=better)	Clinical Process/Effectiveness	**-0.57**	**0.10**	**-0.25**	**0.10**
	Population/Public Health	-0.10	0.03	-0.12	0.04
	Patient Safety	**0.07**	**0.38**	**0.17**	**0.40**
	Care Coordination	**-0.31**	**0.26**	**-0.33**	**0.35**
Quality Composite (higher is better)		**-0.93**	**0.03**	**-0.64**	**0.08**
Cost Domains (low=better)	Total per capita costs	0.21	0.11	**1.45**	**-0.28**
	Condition-Specific Per Capita Costs	0.36	0.03	**1.07**	**-0.23**
Cost Composite (lower is better)		0.10	-0.01	**0.61**	**-0.18**

All bolded differences are significant at p<0.05. For dual enrollment, high refers to practices in the top quintile of proportion of dually-enrolled beneficiaries. For complexity, high refers to practices for which the average HCC risk score among attributed beneficiaries is in the top quartile of HHC risk scores among all fee-for-service Medicare beneficiaries. This table shows results for VM-eligible practices meeting minimum program requirements. Two of six quality domains (patient and family engagement; efficient use of health care resources) were omitted due to a limited number of measures and inadequate sample size.

These results are also reflected in the scatterplots included in the Appendix.

C. Financial Impact of Performance

Finally, practices' quality and cost composite scores determine payment adjustments. Practices that are high-cost and low or average quality, or average cost and low quality, receive a downward payment adjustment (red boxes in Tables 10.13a/b). Practices that are low-cost and average or high quality, or high quality and average cost, receive an upward payment adjustment (green boxes in in Tables 10.13a/b).

Table 10.13a/b. Value Modifier by High-Dual or High-Complexity Practice vs. Other Practice, Among VM-Eligible Practices Meeting Program Requirements

(Note: the tables reflect the actual VM adjustment for practices that selected quality tiering and the VM adjustment that would have been made based on quality and cost scores for those that did not select quality tiering)

Table 10.13a: Value Modifier by High-Dual Practice vs. Other Practice

	High-dual practices (N=88)			Other Practices (N=618)		
	Low Quality	Average Quality	High Quality	Low Quality	Average Quality	High Quality
Low Cost	**3.4%**	**5.7%**	**0.0%**	**1.5%**	**1.1%**	**0.5%**
Average Cost	**14.8%**	**62.5%**	**2.3%**	**3.9%**	**85.6%**	**4.5%**
High Cost	**10.2%**	**0.0%**	**1.1%**	**1.8%**	**1.9%**	**0.2%**

Table 10.13b: Value Modifier by High-complexity Practice vs. Other Practice

	High-complexity practices (N=155)			Other Practices (N=551)		
	Low Quality	Average Quality	High Quality	Low Quality	Average Quality	High Quality
Low Cost	**0.6%**	**0.6%**	**0.0%**	**0.9%**	**2.0%**	**0.5%**
Average Cost	**7.1%**	**72.3%**	**0.6%**	**4.7%**	**85.7%**	**5.3%**
High Cost	**11.6%**	**6.5%**	**0.6%**	**0.4%**	**0.4%**	**0.2%**

Differences in individual cost and quality measure performance translated into higher rates of receiving a downward adjustment. For example, high-dual practices were about three times as likely to receive a downward adjustment compared to other practices (Table 10.14). High-complexity practices were almost five times as likely to receive a downward adjustment compared to other practices, and this was the result of being both lower quality and higher cost compared to other practices. As noted earlier, since quality tiering – which ties performance to payment – was optional in the first year of the Physician VM Program, these adjustments were simulated for the majority of VM-eligible practices that did not elect quality tiering (QT) in the first year. A table showing these results stratified by QT status is available in the Appendix.

Table 10.14. Summary of Payment Adjustment, by High-Dual or High-Complexity Practice vs. Other Practice

Value Modifier	Dually-enrolled			Complexity		
	High	Other	Difference	High	Other	Difference
Downward, % of Practices	25.0%	7.6%	**17.4%**	25.2%	5.4%	**19.7%**
Neutral, % of practices	67.0%	86.2%	**-19.2%**	73.5%	86.8%	**-13.2%**
Upward, % of practices	8.0%	6.1%	**1.8%**	1.3%	7.8%	**-6.5%**

All bolded differences are significant at $p<0.05$. For dually-enrolled beneficiaries, high refers to practices in the top quintile of proportion of dual beneficiaries. For complexity, high refers to practices for which the average HCC risk score among attributed beneficiaries is in the top quartile of HHC risk scores among all fee-for-service Medicare beneficiaries.

VI. Policy Options for Modifying the Current Physician VM Program

A. Introduction

Since the VM program ends in 2019, the policy considerations that follow are generally not logistically feasible for implementation in the Physician VM Program. However, to the extent that the Physician VM Program's approach to measurement or payment adjustment is carried forward to MIPS, many of these considerations would be applicable to MIPS. Simulations would need to be repeated under MIPS measurement and payment structure at such time as these specifications and updated data are available.

Policy options are simulated, and weighed against the policy criteria outlined in Chapter 1 to ultimately inform strategies and considerations for accounting for social risk. Those policy criteria are reiterated in Table 10.15:

Table 10.15: Policy Criteria

Policy Criteria
1. Encourages reduction in disparities in quality and outcomes
2. Protects beneficiaries' access to care by reducing disincentives to caring for high-risk populations
3. Protects providers from unfair financial stress
4. Adjusts only for the difference in performance related directly to the social risk factor, and only for what is beyond provider control
5. Promotes transparency to facilitate consumer choice
6. Supports delivery system reform and Alternative Payment Models

How policymakers weight these criteria could differ. For example, some may feel that protecting providers from unfair financial stress is the most important criterion, and may be willing to adjust for factors under providers' control or negatively impact transparency to achieve that goal. On the other hand, some may feel that transparency is the most important criterion, and argue that avoiding financial stress for providers or promoting delivery system reform are less important policy considerations.

Policy options are summarized in Table 10.16 below, and then explored in detail. Each option is considered in turn, taking into account: 1) earlier findings about the strength of the association of patient vs practice factors on practice performance; 2) the policy criteria described above; and 3) how each option would change payment adjustments made to high social risk vs. other practices, based on simulations. A final set of policy considerations then follows.

Table 10.16. Summary of Policy Options

Option	Description	Pros	Cons
1. Status Quo	Maintain the current policy for VM.	Status quo avoids disrupting a program shortly before it sunsets. High-dual practices are slightly more likely to receive upward adjustment.	High-dual practices are fiscally challenged and their performance may be worse than other practices due to patient factors beyond their control.
2. Adjust Mandatory Quality Measures or Quality Score for Social Risk	a) Add dual status to the formula for calculating mandatory quality measures. b) Provide an upward bump in the composite quality score of high-social-risk practices.	Accounts for differences in risk profile between practices. May protect practices from unfair financial stress. May protect beneficiaries' access to care by reducing disincentives to caring for high-risk populations.	Hides differences in performance by social risk, and may not encourage reduction in disparities in quality and outcomes. Does not account for the fact that some of the differences in quality performance between high-social-risk and other practices may be due to a lower quality of care delivery, and could therefore reward differences beyond those related directly to dual enrollment. Could worsen transparency.
3. Adjust ACSC Measures for Medical Complexity	Add Hierarchical Condition Category (HCC) risk score to the ACSC model.	Accounts for differences in the medical complexity of patients attributed to different practices. May protect practices from unfair financial stress. May protect beneficiaries' access to care by reducing disincentives to caring for high-risk populations. Would be in keeping with the decision in the Medicare Shared Savings Program to move toward risk-adjusted ACSC measures.	Different than the ACSC measure used for larger units (e.g., region).
4. Directly Adjust Mandatory Cost Measures for Dual Status	Add dual enrollment status as an independent predictor to the per capita cost models.	Accounts for dual status as an independent predictor of costs, above and beyond its contribution to the HCC risk score, which is already included in the per capita cost models. May protect beneficiaries' access to care by reducing disincentives to caring for high-risk populations.	Hides differences in performance by social risk.

Table 10.16 (continued). Summary of Policy Options

Option	Description	Pros	Cons
5. Stratify Practices into Groups	Break practices into groups based on the proportion of patients who are dually enrolled.	Compares practices against other "like" practices based on dual enrollment of attributed patients. Similar to what MedPAC has proposed for readmission rates. May protect providers from unfair financial stress. May protect beneficiaries' access to care by reducing disincentives to caring for high-risk populations.	Hides differences in performance by social risk, depending on how stratification is implemented. May not encourage reduction in disparities in quality and outcomes. Does not account for the fact that some of the differences in quality performance between high-social-risk and other practices may be due to a lower quality of care delivery, and could therefore reward differences beyond those related directly to dual enrollment. Might create unusual "cliffs". May penalize practices performing well on an absolute scale.
6. Reward Improvement	Reward practices that improve performance as well as those that achieve high performance.	Gives practices at the bottom of the distribution the chance to reduce penalties by improving, even if absolute performance remains too low to get achievement points.	Improving performance on some of the quality measures (e.g., readmission rates) may be difficult in the context of social risk.
7. Provide a Payment Adjustment for High Performance for Socially At-Risk Populations	Multiply the payment bonus for practices with the highest proportion of dually enrolled beneficiaries.	Acknowledges that achieving high quality may be more difficult in high-social-risk practices, due in part to patient factors. Encourages reduction in disparities in quality and outcomes. May protect practices from unfair financial stress. May protect beneficiaries' access to care by reducing disincentives to caring for high-risk populations. Mirrors the current bonus for high medical risk.	Only rewards practices that are already able to achieve very high performance.
8. Adopt a Health Equity Domain to Reward Practices with Smaller Disparities	Rewards practices with smaller disparities, so long as minimum quality standards are met.	Encourages reduction in disparities in quality and outcomes. Also accounts for the possibility that a given practice may treat patients differently based on social risk.	Practices that do not see a minimum number of high-social-risk and low- social-risk patients would be excluded from this assessment.

B. Results of Policy Simulations

1. Status Quo

There are several reasons for maintaining the status quo. First, the Physician VM Program will sunset at the end of 2018, although certain aspects of it will be included in the Merit-based Incentive Payment System (MIPS), which will apply to Part B payments beginning in 2019. It would be difficult, if not impossible, to implement changes in that timeframe, given the rulemaking schedule. Even if changes were successfully proposed, such changes might be disruptive and confusing to practices that are working to become familiar with program parameters for MIPS. In addition, the effect of any changes to the Physician VM Program would be relatively short-lived. Second, the Physician VM Program has been implemented in a manner that is designed to reward or penalize only a small proportion of practices based on performance. Participating practices receive a high or low quality or cost designation only if their quality or cost composite score is: 1) at least one standard deviation away from the mean of the corresponding peer group, and 2) statistically significantly different from the mean quality or cost composite score. Thus, relatively few practices receive a downward or upward adjustment, and simulated policy changes do not affect this basic distribution. This contrasts with other programs such as HVBP (and likely MIPS), for which the majority of providers receive a downward or upward adjustment.

As a methodological note, the first criterion was used only to classify practices. For large practices subject to the VM Program in its first year and electing quality tiering, the addition of the second criterion to the first criterion had a minor impact on how practices were classified in the program.

Despite strong reasons to maintain the status quo, some might argue that knowingly holding high-dual practices accountable for care that is due to patient factors beyond their control for any length of time risks undermining providers' buy-in for future practice-level pay-for-performance programs, including MIPS. It could also set a weak precedent for equitable performance measurement in MIPS.

2. Adjust Mandatory Quality Measures (ACSCs, Readmissions) or Overall Quality Score for Dual Enrollment Status

The first adjustment option (2a in the table above) is direct adjustment of the mandatory quality measures for dual enrollment status. This policy option would directly account for the challenges that practices face in reducing admissions and readmissions for dually-enrolled beneficiaries, and better account for differences in risk profile between practices. Such adjustment may protect providers from unfair financial stress, and may protect beneficiaries' access to care by reducing disincentives to caring for high-risk populations.

However, adjustment may hide differences in performance by social risk, and may not encourage reduction in disparities in quality and outcomes. Adjustment, depending on how such a technique was implemented, could reward differences beyond those related directly to dual enrollment. Adjusting for social risk could also worsen transparency and make it more difficult for beneficiaries to compare the

absolute performance of a practice. This weakness is especially important to consider if performance measures for physicians or practices are to be publicly reported on Physician Compare.

Though this policy option might change which groups receive penalties or bonuses, it would not change total penalties or bonuses awarded in the Physician VM Program. In this way, it would meet the Physician VM Program's budget neutrality requirement. This option would likely require that each of these measures be tested, validated, and approved with new risk adjustment methodologies.

To simulate this option, the readmissions and ACSC measures were directly adjusted for dual enrollment. Adjusted measures were rolled up to the practice level, producing a new Value Modifier. After adjustment for dual enrollment, differences between high-dual and other practices showed only minor changes, with about 1% fewer high-dual practices receiving a downward adjustment and 1% more high-dual practices receiving an upward adjustment **(**Table 10.17).

Table 10.17. Impact on High-Dual Practices of Adjusting Mandatory VM Quality Measures for Dual Enrollment Status

Value Modifier	High-Dual Practices, Current Program			High-Dual Practices, after Adjustment of Readmissions and ACSCs for Dual Status		
	High	Other	Difference	High	Other	Difference
Downward, % of Practices	25.0%	7.6%	**17.4%**	23.9%	7.6%	**16.3%**
Neutral, % of Practices	67.0%	86.2%	**-19.2%**	68.2%	86.7%	**-18.5%**
Upward, % of Practices	8.0%	6.1%	**1.8%**	8.0%	5.7%	**2.3%**
Bolded differences are significant at p<0.05. For dual enrollment, high refers to practices in the top quintile of proportion of dually-enrolled beneficiaries.						

In option 2b, practices would receive an adjustment at the quality composite level based on their proportion of dually-enrolled beneficiaries. This option would directly address concerns about disincenting care for high-risk populations and concerns about financial strain for high-dual practices. However, as above, the drawback of this option is that it does not account for the fact that some of the differences in quality performance between high-social-risk and other practices may be due to a lower quality of care delivery, and could therefore reward differences beyond those related directly to dual enrollment.

As above, though this policy option might change which groups receive penalties or bonuses, it would not change total penalties or bonuses awarded in the Physician VM Program. In this way, it would meet the Physician VM Program's budget neutrality requirement. This option would require rulemaking.

To simulate this option, the standard deviation of the quality composite score was calculated for all VM-eligible practices. One-fifth of this standard deviation was then multiplied by each practice's percentage of high social risk beneficiaries. The practice-specific product was added to each practice's original quality composite score, to produce a simulated quality composite score for each practice. The

simulated quality composite scores were then standardized, and based on these standardized scores, practices were re-classified into new quality categories.

This version of a quality adjustment led to minimal reductions in the difference between the proportion of high-dual vs. non-high-dual practices receiving a downward adjustment (17.4% vs. 14.0%, Table 10.18):

Table 10.18. Impact of Quality Composite Adjustment for High-Dual Practices

Value Modifier	High-Dual Practices, Current Program			High-Dual Practices, after Applying Quality Composite Adjustment		
	High	Other	Difference	High	Other	Difference
Downward, % of Practices	25.0%	7.6%	**17.4%**	21.6%	7.6%	**14.0%**
Neutral, % of Practices	67.0%	86.2%	**-19.2%**	69.3%	86.6%	**-17.3%**
Upward, % of Practices	8.0%	6.1%	**1.8%**	9.1%	5.8%	**3.3%**
Bolded differences are significant at p<0.05. For dually-enrolled beneficiaries, high refers to practices in the top quintile of proportion of dual beneficiaries.						

3. Adjust ACSCs for Clinical Risk

Ambulatory care sensitive condition measures (ACSCs) are based on the premise that high quality outpatient care can prevent hospitalizations for certain conditions such as pneumonia and heart failure. Thus, higher rates of admission for ACSCs may indicate worse quality. These measures are currently only adjusted for age group and gender. This is because early versions of the ACSC measures were created with large denominators, such as the population of a county or MSA; in groups this large, differences in comorbidities may be less important. However, for comparisons of smaller groups (such as physician practices), small differences in risk profile can translate into large differences in performance. These measures have also not been formally endorsed by NQF or a similar entity to assess physician practices.

Since high-social-risk practices are also more likely to treat beneficiaries with a higher burden of illness, not adjusting ACSCs for clinical risk could unfairly penalize such practices. It may also provide high-social-risk practices with incentives to avoid complex beneficiaries. The benefit of this policy option is thus that it accounts for differences in the medical complexity of patients attributed to different practices, and in doing so, may protect providers from unfair financial stress. It also may protect beneficiaries' access to care by reducing disincentives to caring for high-risk populations. One drawback is that an adjusted measure would be different than the ACSC measure used for larger units (e.g., region).

Though this policy option might change which groups receive penalties or bonuses, it would not change total penalties or bonuses awarded in the Physician VM Program. In this way, it would meet the Physician VM Program's budget neutrality requirement. This option would require measure re-specification and potentially rulemaking.

This policy option modeled adjusting ACSCs for clinical risk by using the HCCs currently utilized for risk-adjusting the readmissions measure. After adjustment for clinical risk, there was little change in the

overall patterns of performance for high-dual or high-complexity practices, in part because these measures are only one component of the overall quality score for practices (Table 10.19a/b).

Table 10.19a. Impact on High-Dual Practices of Adjusting ACSCs for Clinical Risk

Value Modifier	High-Dual Practices, Current Program			High-Dual Practices, after Adjustment of ACSCs for Clinical Risk		
	High	Other	Difference	High	Other	Difference
Downward, % of Practices	25.0%	7.6%	**17.4%**	26.1%	7.9%	**18.2%**
Neutral, % of Practices	67.0%	86.2%	**-19.2%**	65.9%	86.7%	**-20.8%**
Upward, % of Practices	8.0%	6.1%	**1.8%**	8.0%	5.3%	**2.7%**
Bolded differences are significant at p<0.05. For dual enrollment, high refers to practices in the top quintile of proportion of dually-enrolled beneficiaries.						

Table 10.19b. Impact on High-Complexity Practices of Adjusting ACSCs for Clinical Risk

Value Modifier	High-Complexity Practices, Current Program			High-Complexity Practices, after Adjustment of ACSCs for Clinical Risk		
	High	Other	Difference	High	Other	Difference
Downward, % of Practices	25.2%	5.4%	**19.7%**	25.8%	5.8%	**20.0%**
Neutral, % of Practices	73.5%	86.8%	**-13.2%**	72.9%	87.3%	**-14.4%**
Upward, % of Practices	1.3%	7.8%	**-6.5%**	1.3%	6.9%	**-5.6%**
Bolded differences are significant at p<0.05.For complexity, high refers to practices for which the average HCC risk score among attributed beneficiaries is in the top quartile of HHC risk scores among all fee-for-service Medicare beneficiaries.						

4. Directly Adjust Mandatory Cost Measures for Dual Enrollment Status

This policy option would directly account for the fact that dually enrolled beneficiaries have significantly higher resource use than non-dually enrolled beneficiaries even after adjusting for medical comorbidities. In addition, although this policy option might change which groups receive penalties or bonuses, it would not change total penalties or bonuses awarded in the Physician VM Program. In this way, it would meet the Physician VM Program's budget neutrality requirement. However, it also has a few notable weaknesses. Similar to adjusting mandatory quality measures for dual enrollment, this option would likely require that each of the cost measures be tested, validated, and approved with new risk-adjustment methodologies. Adjusting for social risk could also mask performance disparities and make it more difficult for beneficiaries to compare the absolute performance of a practice.

In the current Physician VM Program, the five per capita cost measures are adjusted for HCC risk score (one component of which is dual status), HCC risk score squared, and ESRD. To simulate this option, all per capita cost measures were additionally directly adjusted for dual status (i.e., dual status, HCC risk score, HCC risk score squared, and ESRD; please see Appendix for details). Adjusted measures were rolled up to the practice level, producing a new Value Modifier.

This simulation had little effect on payment adjustments for high-dual practices. While direct adjustment for dual status significantly improved the average cost score for high-dual practices, from 0.14 to 0.02 (with lower cost scores being better), it moved very few high-cost practices enough to lead to a change in payment (Table 10.20). However, the movement that was seen did shift a few high-dual practices from a neutral to upward adjustment:

Table 10.20. Impact of Adjusting Mandatory Cost Measures for Dual Enrollment Status

Value Modifier	High-Dual Practices, Current Program*			High-Dual Practices, after Adjustment of Cost Measures for Dual Enrollment Status		
	High	Other	Difference	High	Other	Difference
Downward, % of Practices	26.1%	7.9%	**18.2%**	26.1%	7.8%	**18.4%**
Neutral, % of Practices	68.2%	85.9%	**-17.7%**	67.0%	86.1%	**-19.0%**
Upward, % of Practices	5.7%	6.1%	**-0.4%**	6.8%	6.1%	**0.7%**

*Note: for this simulation, a different baseline was calculated to facilitate comparative analyses.
Bolded differences are significant at $p<0.05$. For dual enrollment, high refers to practices in the top quintile of proportion of dually-enrolled beneficiaries.

5. Stratify Practices into Groups Based on Social Risk

This policy option compares practices' quality performance to that of other practices with similar proportions of dually-enrolled (or complex) beneficiaries. It addresses the concern that a practice's performance is in part due to patient factors that are difficult to measure precisely but are beyond its control. These include factors for which dual enrollment may be a marker, such as patient social support, financial resources, and health literacy. This option may protect beneficiaries' access to care by reducing disincentives to caring for high-risk populations, and may protect providers from unfair financial stress.

However, a weakness of stratification is that it sets a different standard of care for beneficiaries depending on the practice where they seek their care. The worse performance of high-dual practices on quality measures is in part due to patient factors, but for some quality metrics (e.g., readmissions) it is also due in part to practice factors. If stratification is not paired with incentives for improvement, stratification could give a "free pass" to high-social-risk practices that might otherwise place more effort on changing practice factors that impact quality performance. It may also reduce incentives to address disparities in quality and outcomes.

Though this policy option might change which groups receive penalties or bonuses, it would not change total penalties or bonuses awarded in the Physician VM Program. In this way, it would meet the Physician VM Program's budget neutrality requirement.

This simulation stratified practices into quintiles, based on their proportion of dually-enrolled beneficiaries. Quality composite scores for practices were then re-standardized, based on each practice's performance on this metric relative to other practices in the same quintile. The Value Modifier

was re-calculated using the updated quality composite scores. This simulation eliminated the differences between high-dual and non-high-dual practices in terms of the likelihood of receiving a downward adjustment (i.e., 17.4% before simulation and statistically significant vs. 6.4% after simulation and no statistical significance) (Table 10.21a).

Table 10.21a. Impact of Stratification by Proportion Dually Enrolled, on Upward and Downward Adjustments

Value Modifier	High-Dual Practices, Current Program			High-Dual Practices, after Stratification by Dual Enrollment		
	High	Other	Difference	High	Other	Difference
Downward, % of Practices	25.0%	7.6%	**17.4%**	14.8%	8.4%	6.4%
Neutral, % of Practices	67.0%	86.2%	**-19.2%**	75.0%	85.3%	-10.3%
Upward, % of Practices	8.0%	6.1%	**1.8%**	10.2%	6.3%	3.9%
Bolded differences are significant at p<0.05. For dual enrollment, high refers to practices in the top quintile of proportion of dually-enrolled beneficiaries.						

Stratification also reduced the differences between high-complexity and non-high-complexity practices on the likelihood of receiving a downward adjustment (i.e., 19.7% before simulation vs. 11.3% after simulation) (Table 10.21b).

Table 10.21b. Impact of Stratification by Complexity, on Upward and Downward Adjustments

Value Modifier	High-Complexity Practices, Current Program			High-Complexity Practices, after Stratification by Complexity		
	High	Other	Difference	High	Other	Difference
Downward, % of Practices	25.2%	5.4%	**19.7%**	21.3%	10.0%	**11.3%**
Neutral, % of Practices	73.5%	86.8%	**-13.2%**	76.1%	82.2%	**-6.1%**
Upward, % of Practices	1.3%	7.8%	**-6.5%**	2.6%	7.8%	**-5.2%**
Bolded differences are significant at p<0.05. For complexity, high refers to practices for which the average HCC risk score among attributed beneficiaries is in the top quartile of HHC risk scores among all fee-for-service Medicare beneficiaries.						

6. Reward Improvement

The Physician VM Program rewards achievement, but does not explicitly reward improvement. This approach contrasts with programs such as the Hospital Value-based Purchasing (HVBP) Program, which incentivizes hospitals based on both achievement and improvement.

Rewarding improvement recognizes that high-social-risk practices may start with poorer performance on quality measures in absolute terms, but rewards practices that are able to make significant strides in improving quality even if they have not yet reached the level of quality necessary to avoid penalties. A drawback is that rewarding improvement may not narrow the performance gap between high-social-risk practices and other practices if improvement is also more difficult for beneficiaries with social risk factors.

Data for the second program year were not available at the time of this Report's writing, and thus this option was not simulated.

7. Provide a Financial Incentive for High Performance for Socially At-Risk Populations

This policy option recognizes that it may be more difficult for practices serving beneficiaries with social risk factors to deliver the same quality care as other practices, and that this may in part be due to patient factors beyond a practice's control. The strength of this option is that practices serving beneficiaries with social risk factors are only provided with a bonus if they would have received an upward adjustment in the current program. This option acknowledges that achieving high quality may be more difficult in high-social-risk practices, due in part to patient factors, and encourages reduction in disparities in quality and outcomes by putting a focus on socially at-risk groups. This option may protect providers from unfair financial stress, and may protect beneficiaries' access to care by reducing disincentives to caring for high-risk populations.

One weakness of this option is that few high-social-risk practices reach the performance threshold required to receive an upward adjustment, so few practices would be directly affected by this option.

This policy option would only be budget-neutral if included in the overall budget neutrality calculations for the program, which is feasible. It would likely require rulemaking given the existence of a similar payment adjustment for high-medical-risk practices.

This policy option is modeled after a bonus already included in the Physician VM Program, which accounts for the challenges of treating medically complex beneficiaries. The Physician VM Program's existing high-risk bonus -- +1.0%*(adjustment factor) -- is awarded to practices that perform well and treat beneficiaries that on average are complex, which is defined as the top quartile of the Hierarchical Condition Category (HCC) risk score.

This financial incentive could be operationalized as follows: practices in the highest quintile of social risk that received an upward adjustment under current Physician VM Program parameters would be provided with an extra bonus of +1.0%*(adjustment factor). This would not impact the proportion of practices receiving an upward or downward adjustment, and simply provides the 8% of current high-dual practices that already received an upward payment adjustment with an additional bonus. This option is thus not presented in tabular form here. This option would be budget neutral if the adjustment factor "X" took into account the bonuses.

8. Adopt a Health Equity Measure or Domain to Reward High-Performing Practices that Have Smaller Within-Practice Differences in Quality Performance

The option of providing financial incentives for practices to achieve smaller within-practice quality differences assumes that reducing disparities in care within a practice is a desirable goal. This option mimics what a "health equity" measure or domain might look like, if it were to be developed.

Implementation of such a measure or domain would require development and testing, and thus a simulation is not presented here given the lack of availability of patient-level data for many of the

quality metrics. However, in principle, one way to assess "equity" would be to calculate, for each measure, the ratio of a practice's performance for dually-enrolled beneficiaries versus non-dually-enrolled beneficiaries: for example, if a practice achieved blood pressure control in 60% of its dual beneficiaries and 80% of its non-dual beneficiaries, the equity ratio for the blood pressure control measure would be 0.6/0.8 or 0.75. These ratios could then be averaged across performance measures to create an overall equity score for the practice. Another alternative would be to create z-scores for absolute differences in performance between dually-enrolled beneficiaries and non-dually-enrolled beneficiaries on each measure, and use those z-scores to create a composite score.

Either way, such a score could then be used as a measure, and included in an existing quality domain, or could be made into its own domain. Alternatively, the equity score could be used to create a separate financial incentive: if a practice met a pre-determined quality threshold, it might be eligible to also receive an equity bonus if it performed well on the equity score. Prior to implementation, options would need to be simulated.

VII. Key Findings, Strategies, and Considerations

A. Key Findings

Quality Metrics

- Dually-enrolled beneficiaries and complex beneficiaries had significantly higher readmission and ambulatory care-sensitive admission rates, even after risk adjustment for medical comorbidities and even within the same practice.
- Practices serving a high proportion of dual or complex beneficiaries also had higher readmission rates and ambulatory sensitive condition admission rates, independent of patient risk status. Practice effects were generally substantially smaller than the beneficiary effects for admission rates.

Cost / Resource Use Metrics

- Dually-enrolled beneficiaries had higher costs of care than other beneficiaries, even after risk adjustment and even within the same practices.
- Complex beneficiaries had higher absolute costs of care, but lower risk-adjusted costs of care than other beneficiaries, after accounting for medical risk and within the same practices.
- Practices serving a high proportion of dually-enrolled beneficiaries had similar or higher costs of care than other practices, after accounting for beneficiary dual enrollment status. This was related to beneficiary and practice effects, although beneficiary effects were generally larger than practice effects.
- Practices serving a high proportion of complex beneficiaries had higher costs of care, even after accounting for beneficiary medical risk. Patterns of spending above and beyond complexity (as included in the VM model) were due to practice effects.

Program Impacts

- Many practices did not successfully meet program requirements (failed to self-nominate for the PQRS as a group and report at least one measure, or failed to elect the PQRS administrative claims option) for the Physician VM Program. This was the most common reason for a downward adjustment in the program's first year. High-dual practices were twice as likely as other practices to fail to meet requirements for the program.
- High-dual practices performed worse on quality and similarly on costs to other practices, and therefore were at higher risk of receiving a downward payment adjustment.
- High-complexity practices performed worse on both quality and costs compared to other practices, and therefore were at markedly higher risk of receiving a downward payment adjustment.

Policy Simulations

- Adjusting readmission and ambulatory care-sensitive admission measures for dual enrollment had a negligible impact on payment adjustments.
- Adding medical risk adjustment to the ambulatory care-sensitive admission measures had a negligible impact on payment adjustments for high-dual versus other practices, and high-complexity versus other practices.
- Stratification equalized payment adjustments for high-dual versus other practices, but had a smaller effect on equalizing payment adjustments for high-complexity versus other practices.
- Adjusting cost measures for dual enrollment had little impact on payment adjustments.

B. Strategies and Considerations

Strategies and considerations are outlined below. They are, as in all program chapters in this report, organized into three broad strategies that best meet the policy criteria outlined in Chapter 1. 1) Measure and report quality for beneficiaries with social risk factors; 2) Set high, fair standards for all beneficiaries; and 3) Reward and Support Better Outcomes for Beneficiaries with Social Risk Factors.

Note: Since the VM program ends in 2018, strategies and considerations are provided to help with decision making for MIPS, and generally are not feasible for implementation in VM given that timeframe.

STRATEGY 1: Measure and Report Quality for Beneficiaries with Social Risk Factors

Measurement and reporting are foundational for quality improvement in health care.

CONSIDERATION 1: Consider enhancing data collection and developing statistical techniques to allow measurement and reporting of performance for beneficiaries with social risk factors on key quality and resource use measures.
The ability to measure and track quality, outcomes, and costs for beneficiaries with social risk factors over time is crucial as providers seek to reduce disparities and improve care for these groups to the greatest degree possible. For example, high-dual practices performed worse on a number of dimensions

in the Physician VM Program. In some cases (e.g., the readmission measure), performance differences were due to both beneficiary and practice factors. In other cases (e.g., ACSCs), performance differences were due primarily to beneficiary factors. For many quality measures, data were not available to examine the influence of beneficiary vs. practice factors for many quality measures, since the metrics are collected either on samples of beneficiaries or without patient identifiers.

For measures currently collected on only a sample of patients, such as those related to patient experience and processes of care, a strategy should be developed to capture data that would allow calculation and reporting of performance by important subgroups. This strategy would allow the Department and practices, as well as consumers, to better-understand who performs well for dually-enrolled beneficiaries and where there are particular areas for targeted improvement. This is consistent with the policy goal of encouraging reductions in disparities in quality and outcomes, and also promotes transparency to facilitate consumer choice.

Alternate sampling methods may be necessary for measures in which sample size is currently too small. Such methods could include samples rolled over multiple measurement periods; on the other hand, for some measures, such data collection may ultimately not be feasible. Collecting adequate data on beneficiaries with social risk factors could potentially be burdensome for providers. However, there are many instances in which similar or identical measures are being captured in multiple Medicare sub-populations, including fee-for-service beneficiaries, ACO beneficiaries, and MA beneficiaries within a practice. Harmonizing data collection with other quality programs, including Medicare Advantage or the Medicare Shared Savings Program, could increase the efficiency of data collection while at the same time allowing better identification of disparities in care and outcomes.

When adequate data are available, key quality and resource use measures stratified by social risk should be developed and considered for physician practice feedback and/or public reporting, so that practices, policymakers, and consumers can see and address important disparities in care. While not all measures may lend themselves to reporting by subgroup, a key subset of measures should be pursued for subgroup reporting at the practice level.

CONSIDERATION 2: When feasible, consider developing and introducing a new measure or domain on Achieving Health Equity to MIPS to assess and reward physician practice efforts to reduce health disparities.

As outlined in Chapter 4, the report from the National Academies of Sciences, Engineering, and Medicine performed under the IMPACT body of work supported the prioritization of equity as a key strategy in delivering high-quality care to beneficiaries with social risk factors.[19] Financial incentives help providers prioritize areas for particular focus, and specific measures targeting equity within existing value-based purchasing programs can therefore send a powerful signal. This may be achieved by adding a health equity measure or domain to existing programs.

A measure or domain for health equity should be added to the MIPS quality metrics to provide an explicit incentive and expectation of reducing health disparities for participants in MIPS; this concept was put out for public comment in preparation for the MIPS program. As there are no currently in-use health equity measures in the Medicare programs, this will require development and testing, and is not feasible in the short term or in the VM program. A measure of health equity may play an important role in ensuring that pay-for-performance programs help to incent, rather than disincent, improving care for beneficiaries with social risk factors. This approach would align with the policy criterion of encouraging reduction of disparities.

Specific approaches or measure(s) related to health equity have not been evaluated; however, measures could include performance on measures of disparity reduction (within a practice, or compared to a national benchmark for the patient subgroup of interest), or include structural measures to give credit to ACOs that have undertaken quality improvement efforts targeting beneficiaries with social risk factors.

CONSIDERATION 3: Consider prospectively monitoring for potential unintended consequences in the current VM program and in the MIPS program as it is implemented.

As the VM program expands to more, smaller practices, it will be important to continue to monitor the relationship between the proportion of beneficiaries with social risk factors attributed to a practice and performance under the VM program. In particular, this relationship may be different or of a different magnitude for smaller practices than the larger practices currently included in the program.

Moreover, as the MIPS program is developed and implemented, continued prospective monitoring of the quality of care provided to beneficiaries with social risk factors will help to identify and address unintended consequences of the new program. Findings from the current and future VM program may help to inform particular aspects of the MIPS program that should be a focus of this monitoring.

STRATEGY 2: Set High, Fair Standards for All Beneficiaries

Given the overarching goal of improving care for all beneficiaries, providers should be held to high, fair standards regardless of the beneficiaries they serve.

CONSIDERATION 1: The measures used in the Physician VM Program should continue to be examined to determine if adjustment for social risk factors is appropriate.

The measures in the Physician VM program, similarly to those contained in the HVBP program discussed in Chapter 7, are a diverse set – they include process measures, which are not adjusted for medical or social risk; outcome measures, which are adjusted for medical but not social risk; and resource use measures, which are adjusted for both medical and social risk. This points out the importance of considering each measure independently to determine whether or not adjustment is appropriate, and if

so, what kind.

Adjustment of resource use measures for social risk factors, where such relationships exist, is currently done in the VM program and elsewhere in Medicare because higher resource use (measured as costs) may reflect higher need rather than lower quality. Dually-enrolled beneficiaries may have greater needs, including social support, functional or cognitive limitations, or higher severity of disease, and require greater resources to achieve the same outcomes as other beneficiaries. For example, institutional post-acute care settings, which are more costly than post-acute home health care, may nonetheless be most appropriate for recuperating beneficiaries with unstable housing who cannot safely be discharged home, or for beneficiaries with disabilities who need specialized equipment during their post-acute recovery period. Prior evidence has suggested that beneficiaries with social risk factors are at lower risk of over-use and higher risk of unmet medical need, so failing to account for these factors in resource use measures could have unintended consequences in Medicare value-based purchasing programs.

In this chapter, analyses showed that even after adjusting for medical comorbidities and adjusting for social risk via the HCC score, dually-enrolled individuals had higher spending on the total costs of care measures, in general. This should be explored in more depth, including examination of where the additional spending comes from and whether it is considered preventable, or whether it may be reflective of higher needs. Such information would assist in determining whether further adjustment is necessary.

If deemed necessary, one potential means for adjusting these (or other) resource use measures would be using the updated 2017 HCC risk-adjustment model used for adjusting Medicare Advantage payments. In 2016, the MA program performed analyses of fee-for-service spending and determined that the prior version of the model under-predicted costs for full-benefit dually-enrolled beneficiaries by 8% but over-predicted costs in partial-benefit dually-enrolled beneficiaries. They concluded that the model could be improved by breaking community-dwelling beneficiaries into six mutually exclusive segments to predict costs: under-65 fully dual-enrolled, under-65 partially dual-enrolled, under-65 non dually-enrolled beneficiaries, and these three same dual enrollment categories in the 65 and over population. Currently, the Total and Condition-Specific per Capita Costs of Care measures use a variant of the HCC model; the measures could be tested to determine if simply using the updated HCC model improves estimation of costs for dually-enrolled beneficiaries or beneficiaries with disabilities.

This may be particularly salient as additional resource use measures, such as the Medicare Spending per Beneficiary measure, are added to the program; this measure is not currently adjusted for social risk. This measure is explored in depth in the HVBP chapter, which demonstrates that the additional resource use for dually-enrolled beneficiaries was largely in the post-acute setting, raising the question of whether it was reflective of higher care needs rather than overuse. It will be important to better understand how practices caring for beneficiaries with high social risk performed on the MSPB, and which components of episode spending may have differed for high-social-risk vs. other types of beneficiaries.

CONSIDERATION 2: The ambulatory care-sensitive condition measures should be updated to account for medical risk.

It is standard practice to account for medical risk when measuring quality. This is based on the premise that where possible, comparisons of physician performance should be "apples-to-apples" comparisons. However, the ACSCs, which are mandatory quality measures in the Physician VM Program, adjust only for age and gender. This approach to risk-adjustment may be due to the fact that AHRQ initially intended ACSCs to assess the care of populations in a given region, rather than within a physician practice. Complexity is likely much more comparable for populations across regions than it is for attributed beneficiaries across smaller units, such as practices.

The results included in this chapter suggest that high-dual practices perform worse on a range of ACSCs in large part because of patient factors. Adjusting ACSCs for complexity narrows the performance gap between high-dual and other practices (see Simulation #3). CMS is already working to adjust the ACSCs included in MIPS for medical risk and steps should be taken to expedite this process.

This consideration meets most of the proposed policy criteria: adjusting only for what is beyond provider control; protecting providers from unfair financial stress (to the extent that worse performance on ACSCs by high-dual practices is due to unmeasured medical risk); encouraging reduction in disparities in access (to the extent that better risk-adjustment prevents practices from avoiding high social risk beneficiaries); and promoting transparency to facilitate consumer choice. It would also better-harmonize the measures with the Medicare Shared Savings Program, which recently finalized plans to move to a risk-adjusted ACSC measure.

CONSIDERATION 3: Program measures should be studied to determine whether differences in health status might underlie the observed relationships between social risk and performance, and whether better adjustment for health status might improve the ability to differentiate true differences in performance between providers. Attention should also be given to developing quality and outcome measures specifically designed for the practice setting.

Given the significant differences seen between dual and non-dual individuals on the ACSC and readmissions measures, these metrics should be examined to determine if adding better measures of severity of illness, functional status, frailty, and/or medical complexity may explain some of the excess risk associated with dual enrollment.

Various within-practice differences may contribute to the poor performance of high-dual practices, including treatment bias. However, within-practice differences may also reflect unmeasured patient characteristics for which dual enrollment is a proxy. For example, dually-enrolled beneficiaries may be less likely to have their blood sugar adequately controlled than non-dually-enrolled beneficiaries within a given practice, because the dually-enrolled beneficiaries have higher rates of comorbidities like kidney or liver disease that make blood sugar more difficult to control. Dually-enrolled beneficiaries may be

more likely to be admitted for a urinary tract infection because they have higher levels of functional impairment that make caring for illness at home less feasible. Thus, adding measures of medical complexity, functional status, and/or frailty to quality measures used in the Physician VM program or in MIPS may help ensure that providers do not face undue financial stress, and reduce disincentives to caring for high-risk populations.

Attention should also be given to developing setting-specific quality and outcome measures. Currently, some of the measures in use in the VM program were developed in the hospital setting (readmissions) or broader outpatient setting (ACSCs), and may have lower levels of reliability or otherwise different statistical characteristics when applied to physician practices. As physician payment programs mature, having practice-specific measures may allow better distinctions in quality between physician groups.

STRATEGY 3: Reward and Support Better Outcomes for Beneficiaries with Social Risk Factors

One of the important findings in this chapter was the wide distribution of performance among providers disproportionately serving beneficiaries with social risk factors. This suggests that achieving better outcomes for these groups is feasible. However, in many cases it may require more effort on the part of providers, or more resources and more support, than achieving the same outcomes in a lower-risk population.

CONSIDERATION 1: Consider providing additional payment adjustments for practices that disproportionately serve beneficiaries with social risk factors and achieve high quality, or specifically for achieving high quality in beneficiaries with social risk factors.

Implementing a payment adjustment for practices serving beneficiaries with social risk factors that is similar to the adjustment available to practices with high-medical-risk beneficiaries would provide an opportunity to reward those practices that perform particularly well in these populations. An alternative design could instead reward practices that perform well specifically for beneficiaries with social risk factors, though measures to assess this would need development and testing. This may provide additional protection against any incentives that VM financial incentive model may create to avoid caring for socially high-risk beneficiaries. This consideration is consistent with the policy goals of protecting providers from unfair financial stress and encouraging reduction in disparities in quality, and outcomes.

CONSIDERATION 2: Consider using existing or new quality improvement programs to provide targeted technical assistance to practices that disproportionately serve beneficiaries with social risk factors to help improve quality and ensure they can successfully participate in the reporting required for the MIPS program, or to assist in moving toward alternative payment model (APM) participation.

Since failure to participate was a major driver of penalties in the first year of the VM program, and since this disproportionately affected practices serving beneficiaries with social risk factors, improving

successful participation should be a focus for VM and may need to be a future focus for MIPS. Achieving this goal would reduce the number of providers that serve high-risk beneficiaries and receive a downward adjustment. This in turn could reduce disparities in access.

In the short term, CMS could use quality improvement or learning collaboratives that may exist within the VM support structure, to assist practices serving a high proportion of beneficiaries with social risk factors. Formal learning collaboratives and interdisciplinary collaboration have sometimes been associated with good outcomes in related areas of health care.[20,21]

One longer-term goal would be to better-understand whether or not the challenges associated with Physician VM Program participation differ between high-dual and other practices. A Report prepared for CMS summarized the results of interviews regarding PQRS participation (a precursor to VM).[22] Practices that did not participate in PQRS in 2013 cited a number of concerns including time and the difficulties of submitting measurements without an Electronic Medical Record. Some practices also requested additional technical assistance for the program. However, this Report did not include information on challenges specific to practices serving beneficiaries with social risk factors; it is plausible that reasons for non-participation may differ for these groups. Qualitative research that focuses on practices that care for beneficiaries with social risk factors would be critical to ensuring that these practices are as equipped as their peers to successfully participate in MIPS or an APM.

CONSIDERATION 3: Consider developing demonstrations or models focusing on care innovations that may help achieve better outcomes for beneficiaries with social risk factors.

The inclusion of innovative strategies to improve the care of beneficiaries with social risk factors might be one factor used to evaluate proposals for new APMs targeting ambulatory care, or the expansion of existing APMs.

CONSIDERATION 4: Consider further research to examine the costs of caring for beneficiaries with social risk factors and to determine whether current payments adequately account for these differences in care needs.

Achieving good outcomes in beneficiaries with social risk factors may require more resources than achieving similar outcomes in beneficiaries without social risk factors. However, the costs and strategies for doing so are inadequately understood. Future research could examine the costs to practices of achieving good outcomes for beneficiaries with social risk factors and determine whether current payments, typically based only on differences in medical risk, adequately account for these differences in care needs.

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SECTION 4: Dialysis Facility and Post-Acute Care Value-Based Purchasing Models

Section Four examines dialysis facility and post-acute care value-based purchasing models. Specifically, in the dialysis setting, the End-Stage Renal Disease Quality Incentive Program (ESRD QIP), initiated in FY 2012, penalizes dialysis facilities whose performance on a set of quality measures falls below a threshold. This program, though currently based largely on process measures, will expand in coming years to include patient experience, infection rates, and outcome measures. In the post-acute setting, programs are under development but not yet fully implemented at a national level as of the writing of this Report. In the Skilled Nursing Facility (SNF) setting, a value-based purchasing (VBP) program will begin in 2019, based on performance on a SNF all-cause, all-condition hospital readmission measure. For home health agencies (HHAs), a national demonstration VBP program which includes measures of patient experience, quality, outcomes, safety, and costs of care has been launched, with the first payment adjustments scheduled to begin in calendar year 2018 based on calendar year 2016 performance data.

Therefore, across all three of these settings, the current value-based purchasing programs are either changing rapidly or not yet fully implemented. The chapters that follow explore each in turn, but readers should keep in mind that these programs in particular may warrant further analyses in the future as they evolve and/or enter the implementation phase.

CHAPTER 11: The End-Stage Renal Disease Quality Incentive Program

In This Chapter:

- ***Is there a relationship between beneficiary social risk and performance on the metrics that comprise the End-Stage Renal Disease Quality Incentive Program?***
- ***Is there a relationship between facility social risk profile and performance on the metrics that comprise the program?***
- ***Are facilities that serve a high proportion of beneficiaries with social risk factors more likely to receive penalties under this program?***

This chapter presents findings on the relationship between patient or facility social risk and performance under the End-Stage Renal Disease Quality Incentive Program (ESRD QIP).

Key Findings:

- Beneficiaries with social risk factors have worse performance on many quality measures in the ESRD QIP, even within the same facilities.
- Facilities with a high proportion of beneficiaries with social risk factors were more likely to receive payment reductions. However, because so few facilities are penalized overall in the Quality Incentive Program, these significant relative differences in the likelihood of being penalized translate to small absolute differences in the number of facilities penalized.
- Measures that may be added to the program in future years are in areas where safety-net providers have traditionally performed more poorly.

Strategies and Considerations for the ESRD QIP

SUMMARY OF STRATEGIES AND CONSIDERATIONS
STRATEGY 1: Measure and Report Quality for Beneficiaries with Social Risk Factors
CONSIDERATION 1: Consider enhancing data collection and developing statistical techniques to allow measurement and reporting of performance for beneficiaries with social risk factors on key quality and resource use measures.
CONSIDERATION 2: When feasible, consider developing and introducing a new measure or domain on Achieving Health Equity to the ESRD QIP to assess and reward facility efforts to reduce health disparities.

CONSIDERATION 3: Prospectively monitor the financial impact of the ESRD QIP on facilities disproportionately serving beneficiaries with social risk factors.
STRATEGY 2: Set High, Fair Standards for All Beneficiaries
CONSIDERATION 1: The measures used in the ESRD QIP should continue to be examined to determine if adjustment for social risk factors is appropriate.
CONSIDERATION 2: Program measures should be studied to determine whether differences in health status might underlie the observed relationships between social risk and performance, and whether better adjustment for health status might improve the ability to differentiate true differences in performance between facilities.
STRATEGY 3: Reward and Support Better Outcomes for Beneficiaries with Social Risk Factors
CONSIDERATION 1: Consider providing additional financial incentives to reward facilities that achieve high quality or significant improvement for beneficiaries with social risk factors.
CONSIDERATION 2: Consider using existing or new quality improvement programs to provide targeted technical assistance to facilities that disproportionately serve beneficiaries with social risk factors to improve quality and ensure they can successfully participate in the reporting required for the ESRD QIP.
CONSIDERATION 3: Consider developing demonstrations or models focusing on care innovations that may help achieve better outcomes for beneficiaries with social risk factors.
CONSIDERATION 4: Consider further research to examine the costs of caring for beneficiaries with social risk factors and to determine whether current payments adequately account for these differences in care needs.

I. Introduction

A. Background

End-Stage Renal Disease (ESRD) is a condition in which an individual's kidneys no longer work adequately, leading to the need for either kidney transplantation or chronic dialysis. ESRD qualifies individuals of all ages for Medicare; thus, a significant proportion of dialysis services in the U.S. are funded through Medicare. Currently, just under 1% of the Medicare population, or nearly 500,000 Medicare beneficiaries, has ESRD.

Dialysis facilities are paid a prospective payment for a bundle of renal dialysis services on a per treatment basis. Beginning in 2012, the ESRD Quality Incentive Program (QIP) linked a portion of this prospective payment to performance on a set of quality measures. For payment year (PY) 2015 (reflecting performance in calendar year 2013), performance was measured on 6 "clinical measures," which together constituted 75% of the total performance score (TPS): one measure of anemia management (whether facilities over-prescribe erythropoiesis-stimulating agents (ESAs) in managing beneficiaries' hemoglobin levels), three measures of dialysis adequacy (how well the dialysis has worked to rid the blood of toxins among three subpopulations of ESRD beneficiaries), and two measures of vascular access (whether the beneficiary uses a fistula, which is preferred, and whether the beneficiary has used a catheter for 90 days or longer, which is not preferred, for their dialysis sessions). On each, facilities receive the higher of achievement or improvement points.

Performance for PY2015 was also assessed on 4 "reporting measures," which made up the remaining 25% of the TPS: one measure requiring reporting of anemia management indicator values on claims, one measure requiring administration of a patient experience survey, one measure requiring reporting of mineral metabolism indicator values, and one measure requiring reporting of infection events to the Centers for Disease Control and Prevention's National Healthcare Safety Network. On these measures, facilities receive full points for full reporting, regardless of actual performance on the measure.

In coming years, the program will expand to include additional outcome and patient experience measures;[1] for example, for PY 2017 a standardized readmission ratio and a measure of bloodstream infection will be added to the clinical performance measures, and for PY 2018 a standardized transfusion ratio and a patient experience survey will be added to the clinical performance measures. A number of measures will also be added to the reporting measure list. The proposed inclusion of the readmission measure in particular has been controversial.[2]

To receive a TPS, a facility must receive a score on at least one clinical measure and at least one reporting measure; for the clinical measures, a facility must have 11 eligible beneficiaries to receive a score on that measure. The TPS is used to determine whether or not facilities receive a payment reduction. In payment year (PY) 2015, facilities scoring above 60 on the TPS received no payment reduction; facilities scoring 50 to 59 received an 0.5% reduction, 40 to 49 a 1.0% reduction, 30 to 39 a 1.5% reduction, and 0 to 29 a 2.0% reduction.

B. Existing Research on Differences in Performance on the ESRD QIP based on Social Risk Factors

Though little is known about how the ESRD QIP has financially impacted providers serving a high proportion of beneficiaries who are at high social risk, there is a significant body of research examining disparities in ESRD quality and outcomes based on social risk factors.

Both the likelihood of developing ESRD and quality of care for beneficiaries with established ESRD is also related to social risk factors. Black and Hispanic individuals, as well as individuals living in poverty, are up to three times as likely to develop ESRD.[3-6] Dialysis facilities serving high proportions of Black and Hispanic beneficiaries or located in neighborhoods with a high proportion of Black beneficiaries may have worse performance on quality measures.[7-9] Facilities with low performance on dialysis adequacy are more likely to have higher proportions of Black beneficiaries as well as beneficiaries from low-income neighborhoods.[10] In terms of specific metrics, Black and Hispanic beneficiaries are more likely to receive inadequate dialysis,[11] and less likely to dialyze via an arterio-venous fistula (AVF, the preferred vascular access type), with odds of 0.9 and 0.7 for doing so in a recent study.[12] Studies have raised questions about whether observed disparities are due to patient or facility factors, which has implications for performance measurement.[10,13]

On the other hand, while survival with chronic kidney disease is worse for Black and Hispanic beneficiaries compared to Whites,[14] studies have documented a survival advantage for Black and Hispanic beneficiaries after the onset of ESRD compared to White beneficiaries.[15,16] It has been argued that this may be due to differential biology in these groups, or differential response to therapy, but remains largely unexplained.

Finally, studies examining renal care for rural beneficiaries have not shown consistent differences in pre-ESRD or dialysis care compared to urban areas, with most studies showing generally similar outcomes and no differences in access to dialysis or transplantation.[17-19] However, truly remote rural beneficiaries (more than 100 miles from a dialysis facility) may face different challenges and have worse outcomes.[20]

C. Limitations

Similar to the other settings, the definitions of social risk that are used in this chapter are limited to those which are currently available in Medicare data. There may be other social risk factors that are equally or more important to consider that have not been addressed due to data limitations. Currently, the ESRD QIP includes a significant number of measures on which performance is uniformly high, including reporting-only measures. In future years, the program has proposed to implement more outcome measures; as new measures are added to the program, its scoring distribution and impact on dialysis facilities may change. In the ESRD QIP, many measures are collected at the beneficiary-month level; this adds significant computational complexity to modeling since both within-beneficiary and within-facility correlation must be taken into account. Therefore, the models run for this chapter differ somewhat from those constructed for analyses in other chapters, in that they are not pure within-facility models. Finally, data limitations precluded analyses of outcome measures that will be included in the ESRD QIP in the future, particularly the standardized readmissions measure – this is a new measure with a complex computational approach that could not be replicated with current data in a time frame

adequate to allow its inclusion in this chapter. This will be an important point for analysis in the coming years.

D. Framework for the Chapter: Analytic Findings, Policy Simulations, Strategies, and Considerations

The remainder of this chapter is structured as follows. First, it describes underlying relationships between social risk and performance on the measures that comprise the ESRD QIP. Next, it examines the performance of facilities serving beneficiaries with social risk factors on these measures, and then the performance of these facilities under the ESRD QIP payment reduction scheme. Finally, strategies and considerations for the ESRD QIP are presented, using the strategic framework outlined in Chapter 1: 1) measure and report quality for beneficiaries with social risk factors; 2) set high, fair standards for all beneficiaries; and 3) reward and support better outcomes for beneficiaries with social risk factors. These three strategies build on each other to address social risk in Medicare payment programs.

II. Beneficiary and Facility Characteristics

A. Beneficiary Characteristics

To define social risk factors, the parameters outlined in Chapter 2 were followed, examining dually-enrolled beneficiaries, beneficiaries living in low-income ZCTAs, beneficiaries with disabilities, and Black, Hispanic, and rural beneficiaries. The ESRD patient population tends to be younger, but much more socially and medically complex, than Medicare beneficiaries as a whole. For example, median age in the dialysis population comprising these ESRD QIP measures in 2013 was 63, compared with over 70 in the FFS population, since ESRD can qualify a beneficiary for Medicare at any age. A strikingly higher proportion of ESRD beneficiaries were dually-enrolled, originally entitled to Medicare based on a disability, Black, and/or Hispanic compared to the FFS group. ESRD beneficiaries were less likely to live in a low-income ZCTA, and less likely to be in a rural location (Table 11.1). ESRD beneficiaries also had markedly higher rates of nearly all major comorbidities captured in the hierarchical condition categories (HCCs), including six-fold higher rates of congestive heart failure and 15-fold higher rates of diabetes with kidney or circulatory complications (Table 11.1):

Table 11.1: Patient Characteristics

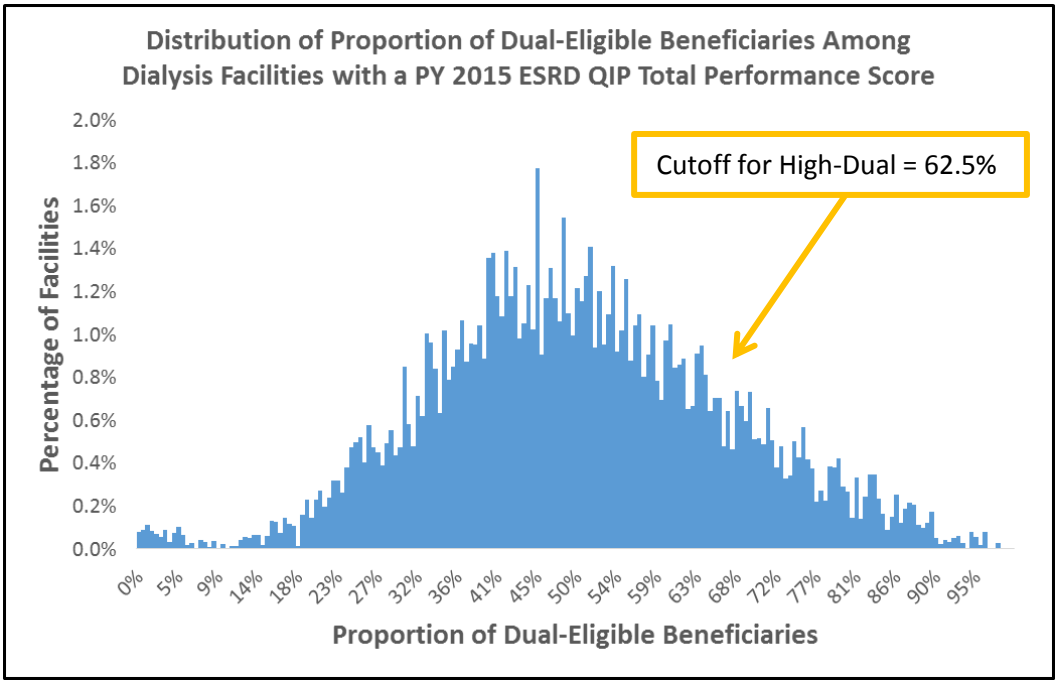
	Fee-for-Service Medicare *	All Dialysis	Dually-enrolled	Originally Entitled to Medicare Based on Disability	Black	Hispanic	Low-Income ZCTA	Rural
Median Age	71	63	58	61	60	61	61	64
Male	42.8%	54.4%	49.4%	55.2%	52.0%	56.5%	52.6%	52.8%
Dually-enrolled	18.8%	50.0%	100%	58.7%	58.9%	65.7%	63.4%	49.6%
Originally Entitled to Medicare Based on Disability	23.3%	29.4%	34.5%	100%	34.6%	26.5%	32.9%	33.0%
Black	10.1%	37.6%	44.2%	44.3%	100%	0%†	52.5%	31.0%
Hispanic	3.8%	15.9%	20.9%	14.3%	0%†	100%	25.4%	8.8%
Low Income ZCTA	21.3%	19.8%	25.1%	22.1%	27.6%	31.6%	100%	23.8%
Rural	16.8%	10.8%	10.7%	12.1%	8.9%	6.0%	13.0%	100%
Select Comorbidities								
Congestive Heart Failure	10.7%	64.5%	65.5%	69.0%	63.8%	60.3%	64.1%	65.2%
Diabetes With Renal Or Peripheral Circulatory Manifestation	3.8%	58.5%	60.9%	66.5%	55.7%	72.4%	61.1%	56.7%
Vascular Disease	12.2%	44.6%	45.0%	45.4%	43.4%	45.3%	44.9%	43.0%
Heart Arrhythmias	13.2%	36.1%	32.3%	36.0%	29.9%	27.6%	30.7%	36.4%
Chronic Obstructive Pulmonary Disease	11.2%	33.9%	34.7%	38.5%	29.3%	25.3%	32.8%	38.6%
Protein-Calorie Malnutrition	1.3%	25.4%	27.1%	27.7%	26.0%	23.1%	26.0%	23.0%
Ischemic Or Unspecified Stroke	3.1%	15.4%	17.2%	18.5%	17.2%	14.5%	15.8%	13.8%
Angina Pectoris/Old Myocardial Infarction	4.2%	14.6%	14.3%	16.2%	13.2%	13.5%	14.1%	15.6%

*: Comparison is the group of FFS beneficiaries included in year 1 of the Physician Value-based payment modifier program.
†: Black and Hispanic are mutually exclusive in the current Medicare race and ethnicity data.

B. Facility Characteristics

To examine facility performance, facilities in the top 20% of each social risk factor were categorized as the facility group of interest (for example, high-dual, high-disabled, etc.). Figure 11.1 shows the distribution of dually-enrolled beneficiaries across facilities; the cutoff to be labeled a "high-dual" facility was 62.5% dual:

Figure 11.1: Distribution of dually-enrolled beneficiaries across dialysis facilities



Distributions of the other social risk factors can be found in the Appendix to this chapter.

There were 5651 dialysis facilities included in the analytic sample; this was after excluding facilities that were either too small or too new to have quality information available for scoring in the PY 2015 ESRD QIP. Overall, the average number of beneficiaries served in a facility was 85; rural providers were smaller with an average of 62 beneficiaries served (Table 11.2). Most facilities were for-profit in nature and belonged to large corporations (DaVita, etc.). Unsurprisingly, high-dual facilities had a particularly high proportion of dually-enrolled beneficiaries, at 73%; similarly, high-Black (82% Black), high-Hispanic (51% Hispanic), and rural (48% rural) facilities had high proportions of these types of beneficiaries. There was significant overlap between the social risk groups of interest, with higher-than-average levels of dually-enrolled beneficiaries at each of the other facility types examined with the exception of rural providers, and higher-than-average levels of low-income ZCTA beneficiaries in each of the other facility types examined.

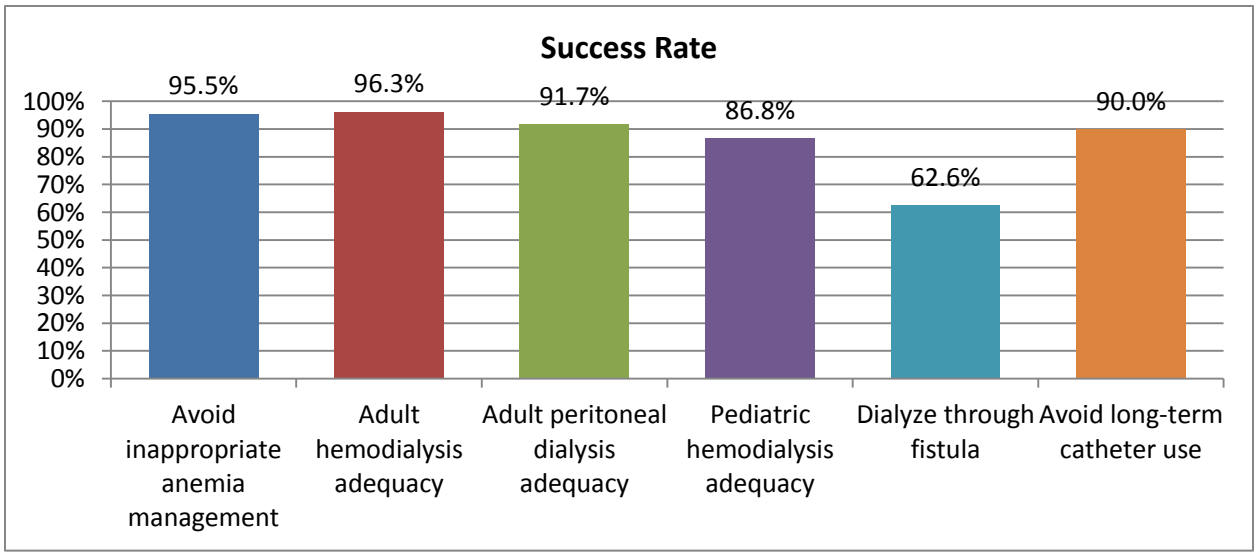
Table 11.2: Facility Characteristics

	All	High-Dual	High-Disabled	High-Black	High-Hispanic	Low Income	Rural Provider
N facilities	5651	1131	1130	1130	1131	1131	1342
N beneficiaries	85	90	72	92	94	82	62
N beneficiary-months	643	709	554	734	724	671	485
For-Profit	87.1%	87.1%	88.0%	90.8%	91.6%	89.4%	81.4%
Large Corporation	72.6%	65.9%	75.4%	79.0%	68.4%	76.2%	71.7%
Patients Served							
% Dually-enrolled	49.7%	73.0%	54.8%	56.8%	59.0%	60.4%	49.8%
% Originally Entitled to Medicare Based on Disability	29.4%	29.8%	41.9%	33.4%	26.1%	33.2%	33.2%
% Black	37.6%	44.3%	50.7%	82.0%	18.4%	47.4%	31.8%
% Hispanic	15.7%	30.4%	6.8%	2.7%	51.2%	25.1%	8.3%
% Low Income ZCTA	19.6%	35.7%	28.9%	32.5%	27.8%	53.8%	25.3%
% Rural	10.8%	7.7%	19.5%	10.8%	5.0%	20.0%	48.2%
ZCTA=ZIP code tabulation area							

III. Beneficiary social risk and Outcomes under the ESRD QIP

Overall performance on the quality measures high across measures, with four of the six clinical measures demonstrating performance greater than 90% (Figure 11.2):

Figure 11.2: Average performance on ESRD QIP clinical quality measures



The relationship between beneficiary social risk and 5 of the 6 measures used in the PY 2015 ESRD QIP was examined (sample size for the sixth measure, pediatric dialysis adequacy, was too small to examine across facility or patient types). Because data are collected at the beneficiary-month level, a binomial model with an overdispersion factor to account for within-beneficiary correlation was used; in additional models, a facility effect was included to account for within-facility correlation (please see Technical Appendix for full details). Note that for some measures in this program, higher is better (dialysis adequacy, fistula use), while for others, higher is worse (inappropriate anemia management, long-term catheter use).

When the quality measures were analyzed, significant differences in performance by social risk were apparent. Raw performance rates for each measure can be found in the Appendix; odds ratios are shown below. Dually-enrolled beneficiaries did worse on all five measures, and beneficiaries with disabilities worse on three; findings for the other groups were more mixed (Table 11.3):

Table 11.3: PY 2015 ESRD QIP Quality Measures and Social Risk Factors, Total Odds Ratios

	Inappropriate Anemia Management (lower is better)	Adult Hemodialysis Adequacy (higher is better)	Adult Peritoneal Dialysis Adequacy (higher is better)	Fistula Use (higher is better)	Long-term Catheter Use (lower is better)
Dually-enrolled	**1.08**	**0.87**	**0.91**	**0.82**	**1.14**
Disability	1.00	**0.72**	0.95	**0.82**	**1.16**
Black	**0.97**	**0.88**	**0.84**	**0.65**	**0.91**
Hispanic	**1.10**	**1.48**	0.92	**1.35**	**0.78**
Low Income ZCTA	**1.03**	0.99	1.01	**0.95**	**0.92**
Rural	0.99	**0.87**	0.99	1.01	**1.09**
Bolded comparisons are significant at p<0.05.					

When a facility effect was added to the models to account for non-independence of outcomes among beneficiaries treated at the same facility, the results were largely unchanged: dually-enrolled beneficiaries did worse on all 5 of the measures, rural beneficiaries did worse on four, and beneficiaries with disabilities did worse on three. Patterns remained mixed for Black and Hispanic beneficiaries, as well as beneficiaries living in low-income ZCTAs, who did better on some measures and worse on others.

Next, all social risk factors were combined into a single model to determine whether there was a dominant social risk factor predictive of poor outcomes in this group. These models suggested that dual enrollment was the most powerful predictor; dually-enrolled beneficiaries continued to have worse performance on all five measures; beneficiaries with disabilities had worse performance on 3/5 measures as well (Table 11.4):

Table 11.4: PY 2015 ESRD QIP Quality Measures, including all Social Risk Factors in same model

	Inappropriate Anemia Management (lower is better)	Adult Hemodialysis Adequacy (higher is better)	Adult Peritoneal Dialysis Adequacy (higher is better)	Fistula Use (higher is better)	Long-term Catheter Use (lower is better)
Dually-enrolled	**1.08**	**0.87**	**0.94**	**0.86**	**1.20**
Disabled	0.99	**0.74**	0.97	**0.87**	**1.15**
Black	**0.97**	1.01	**0.83**	**0.69**	**0.82**
Hispanic	**1.07**	**1.49**	**0.90**	**1.16**	**0.70**
Low Income ZCTA	**1.02**	1.00	1.04	1.01	**0.93**
Rural	0.99	**0.90**	1.00	0.99	**1.05**
Bolded comparisons are significant at p<0.05.					

These findings suggest a significant difference in performance based on social risk, even after accounting for correlation of outcomes within facilities. Beneficiaries with higher social risk, particularly dually-enrolled beneficiaries, experienced worse outcomes than beneficiaries with lower social risk on multiple measures. The finding that dual enrollment, which serves as a proxy for an individual's income, was more powerfully related to outcomes than living in a low-income neighborhood, is consistent across settings examined in this report.

IV. Facility Social Risk and Outcomes under the ESRD QIP

Next, analyses were conducted to determine whether there was a facility effect. As outlined in Chapter 2, facilities in the top 20% of each social risk factor were considered to be the groups of interest. These were again beneficiary-level models adjusting for correlation within beneficiary and within facility – here, since the predictor of interest was a facility characteristic, only the models that take within-facility correlation into account are shown.

By facility, the results were less striking than those for beneficiary characteristics; for most facility types, performance was mixed. High-Hispanic dialysis facilities were the exception, performing better on 3/5 measures (Table 11.5):

Table 11.5: PY 2015 ESRD QIP Quality Measures and Facility Level of Social Risk Factors

Facility Type	Inappropriate Anemia Management (lower is better)	Adult Hemodialysis Adequacy (higher is better)	Adult Peritoneal Dialysis Adequacy (higher is better)	Fistula Use (higher is better)	Long-term Catheter Use (lower is better)
High-Dual	1.00	0.96	0.93	**0.93**	**0.93**
High-Disabled	1.09	**0.91**	1.08	**0.89**	1.02
High-Black	0.90	1.07	0.99	**0.72**	**0.87**
High-Hispanic	0.96	**1.18**	1.05	**1.17**	**0.84**
Low Income	0.96	1.09	1.00	**0.90**	**0.86**
Rural Provider	**1.15**	**0.92**	**1.36**	**1.05**	0.98
Bolded comparisons are significant at p<0.05.					

Multivariate models did not qualitatively alter these patterns of performance.

Additional analyses were conducted in which both patient-level and facility-level factors were included in a single model to determine the degree to which they were independent of each other; these results were similar and can be found in the technical appendix.

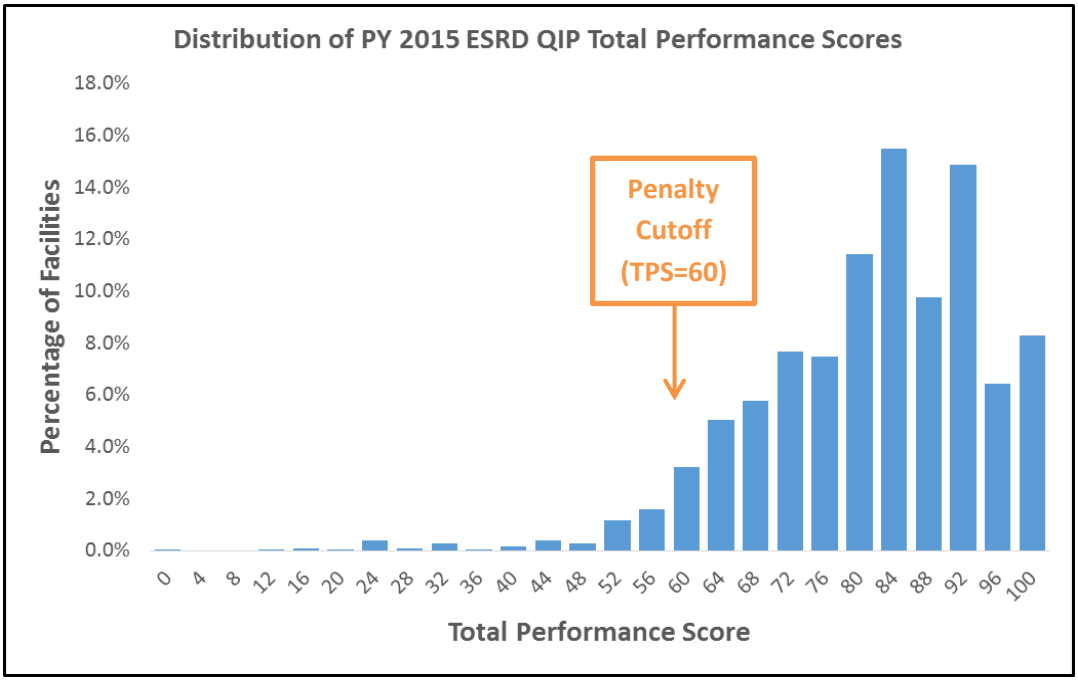
Therefore, these analyses suggest that there are significant differences in ESRD measure performance based on beneficiary social risk, with dually-enrolled beneficiaries, beneficiaries with disabilities, and rural beneficiaries less likely to meet the quality measures that were examined. Findings at the facility level were more mixed, with no facility type performing more poorly than average on more than 2 of the 5 clinical measures.

V. Performance on the ESRD QIP for Facilities with High Levels of Social Risk Factors

The measures in the ESRD QIP are assessed using both achievement and improvement scores, such that facilities can earn points either for meeting achievement thresholds or for improving their performance relative to the previous calendar year. Therefore, the performance patterns above may not translate directly to the program scores, since high scores may reflect either high performance or high improvement.

In PY2015, overall performance under the ESRD QIP was good relative to the penalty cutoff, with an average total performance score of 81.0 and a long left tail (Figure 11.3):

Figure 11.3: Distribution of PY 2015 ESRD QIP Total Performance Scores



Facilities with high proportions of socially-at risk beneficiaries had relatively similar scores on most measures overall, and on total performance score. The individual measures described above are combined into composites for the purposes of scoring, and these are shown below; reporting-only measures together comprise 25% of the total performance score, but performance is uniformly high (on average, 9.5-9.9 points out of ten) and thus these measures are only displayed in the Appendix. Overall, differences in performance between facility types on the quality measures were small, with the exception of fistula use (Table 11.6a):

Table 11.6a: Measure Scores for PY2015

Facility Type	Inappropriate Anemia Management	Adult Hemodialysis Adequacy	Adult Peritoneal Dialysis Adequacy	Fistula Use	Long-term Catheter Use
National Average	9.5	6.8	7.2	6.1	6.4
High-Dual	**9.4**	7.0	6.6	**5.6**	6.5
High-Disabled	9.5	6.8	7.1	**5.6**	6.5
High-Black	9.5	6.8	6.9	**4.4**	**6.8**
High-Hispanic	9.5	7.0	7.1	**6.6**	**6.8**
Low Income	9.5	**7.1**	7.3	**5.5**	**6.9**
Rural Provider	**9.6**	**6.9**	7.9	**6.4**	**6.7**
Bolded comparisons are significant at p<0.05.					

Differences in overall performance were also small, with high-Black facilities demonstrating statistically significantly lower total performance scores on average, and low-income-serving and rural facilities demonstrating statistically significantly higher total performance scores (Table 11.6b):

Table 11.6b: Total Scores for PY2015

Facility Type	Overall Clinical	Overall Reporting	Total Performance
National Average	7.5	9.8	80.8
High-Dually-enrolled	7.4	**9.7**	80.2
High-Disabled	7.4	**9.7**	79.9
High-Black	**7.3**	9.8	**79.5**
High-Hispanic	**7.7**	9.8	82.4
Low Income	**7.6**	9.8	**81.6**
Rural Provider	**7.7**	9.8	**82.0**
Bolded comparisons are significant at p<0.05.			

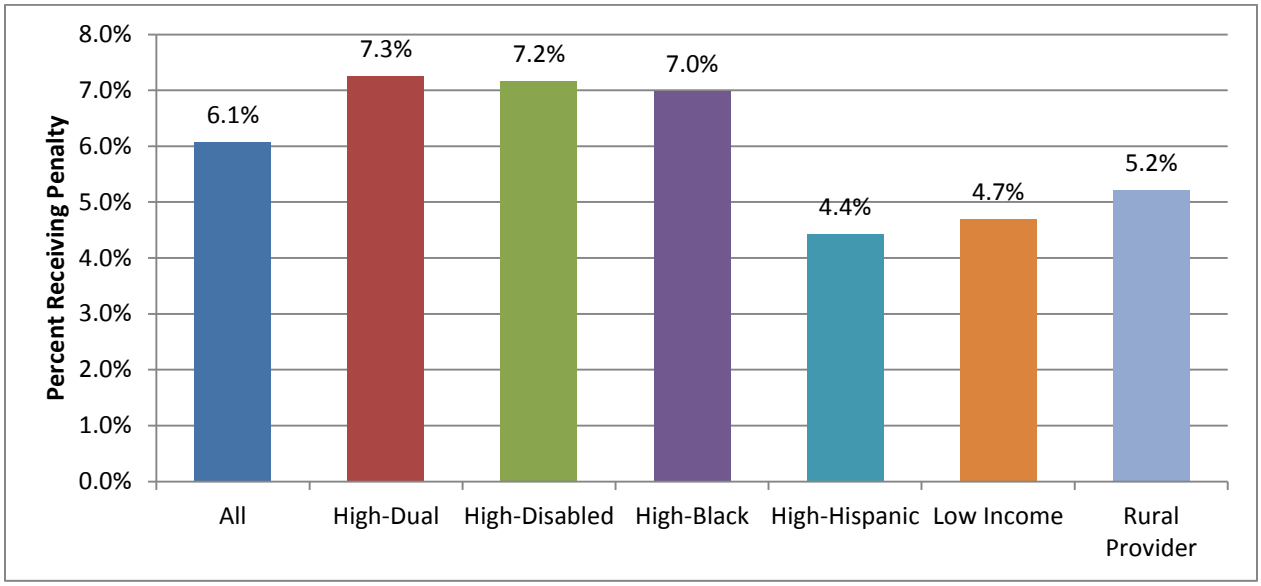
As described above, facilities scoring below 60 points were eligible to receive a penalty in PY 2015. In PY 2015, only 343 (6.1%) of facilities received a payment reduction in 2015 out of 5,651 facilities treating a sufficient number of beneficiaries to be eligible to receive a total performance score, with most of those receiving only a 0.5% reduction and very few the maximum reduction of 2.0%:

Table 11.7: PY 2015 ESRD QIP Payment Reductions

Payment Reduction	Number of Facilities	% of Facilities
No Reduction*	5308	93.9%
0.5% Payment Reduction	242	4.3%
1.0% Payment Reduction	41	0.7%
1.5% Payment Reduction	23	0.4%
2.0% Payment Reduction	37	0.7%
*=Does not include the 488 facilities too small or too new to the program to receive a total performance score		

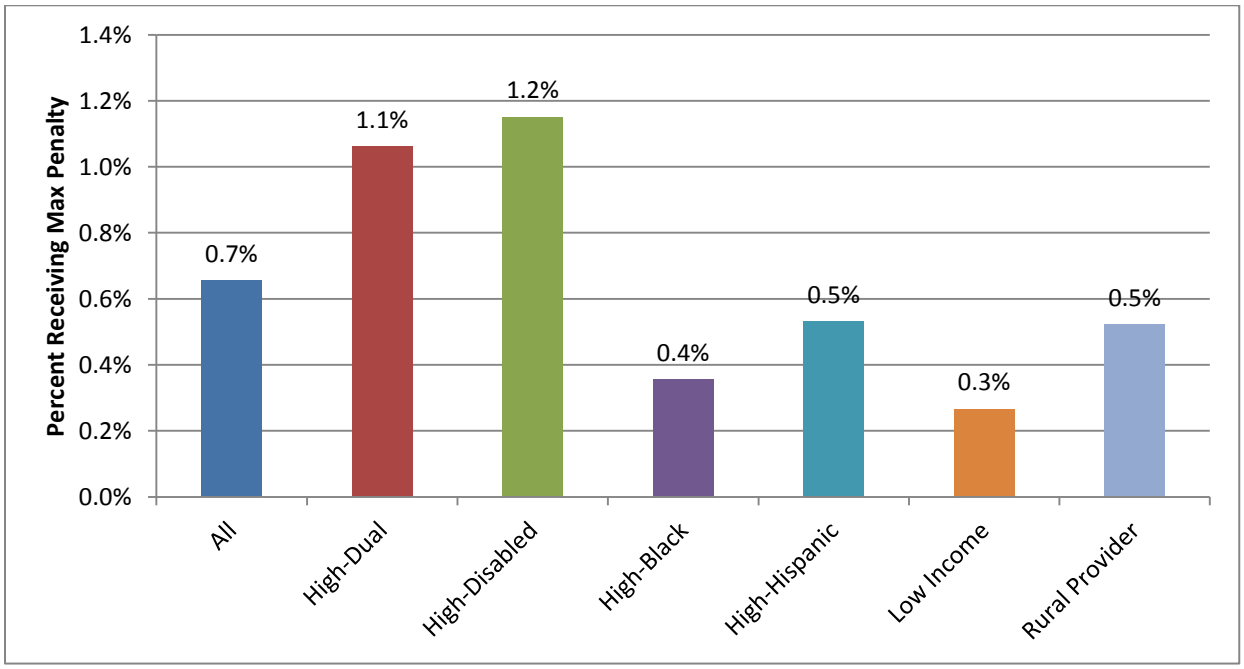
Overall, facilities that served a high proportion of dual, disabled, or Black beneficiaries were more likely to be penalized; high-Hispanic facilities, those with a high proportion of beneficiaries residing in low-income areas, and rural facilities were less likely to be penalized (Figure 11.4).

Figure 11.4: Likelihood of Penalties by Facility Type



Facilities with a high proportion of dual or disabled beneficiaries were also significantly more likely to receive the maximum penalty of 2%, and thus were over-represented in the maximum penalty group (comprising 32.4% of the max penalty group and 35.1% of this group, respectively. However, the absolute numbers are small: only 37 facilities in total received the 2% penalty, 12 of which were high-dual and 13 of which were high-disabled (Figure 11.5):

Figure 11.5: Likelihood of Maximum (2%) Penalties by Facility Type



Therefore, though differences in performance were small, these translated to meaningful differences in the likelihood of penalties and the likelihood of maximum penalties for facilities with a high proportion of socially-at risk beneficiaries, particularly those who are dually-enrolled and those with disabilities.

VI. Performance on Measures in Star Ratings by Facility Social Risk

Though not included in the current ESRD QIP, there are additional metrics currently included in the Dialysis Facility Compare online rating program. Specifically, the Standardized Readmission Ratio was added in PY 2017 and the Standardized Transfusion Ratio will be added in PY 2018. Therefore, facility performance on these metrics during the same time period as performance on the ESRD QIP measures (referred to by the calendar year of reporting (CY) rather than payment year (PY)) was also examined. Of note, the standardized mortality ratio measure, which is in the star ratings though not included in the ESRD QIP, is currently adjusted for race; the measure is adjusted for race because Black beneficiaries are significantly less likely to die once they are on dialysis, as outlined in the background section above. The adjustment of this measure for race has been the subject of some controversy.

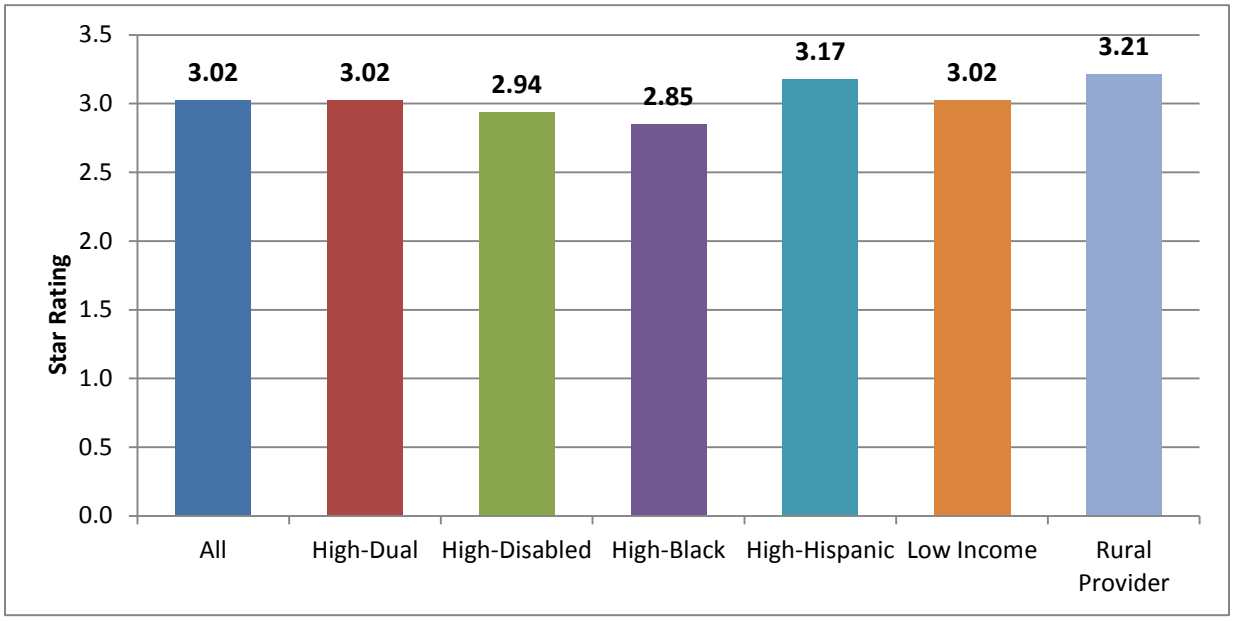
Table 11.8: Standardized Ratio Measures for CY 2015 Performance Measure Period

Facility Type	Standardized Hospitalization Ratio	Standardized Transfusion Ratio	Standardized Mortality Ratio	Standardized Readmission Ratio
National Average	1.00	0.99	1.03	1.00
High-Dual	1.01	**1.03**	**1.06**	**1.03**
High-Disabled	1.01	0.98	**1.08**	**0.98**
High-Black	0.99	**1.02**	**1.06**	**1.03**
High-Hispanic	1.00	1.00	**1.05**	1.00
Low Income	**0.95**	**0.97**	**1.08**	**0.94**
Rural Provider	**0.87**	**0.90**	1.03	**0.90**
Bolded comparisons are significant at p<0.05.				

On these metrics, like those which are currently included in the program, low-income ZCTA and rural providers tended to have slightly better performance overall. On the mortality measure in particular, all of the facilities serving beneficiaries with social risk factors with the exception of rural performed significantly worse than their counterparts.

Performance on these measures is combined with performance on many of the measures from the ESRD QIP above to create a total Star Rating. Analyses revealed fairly minimal differences in average Star Rating by facility type, though high-disabled and high-Black facilities performed more poorly than average, and high-Hispanic and rural facilities performed better than average (Figure 11.6):

Figure 11.6: Star Ratings by Facility Type



VII. Key Findings, Strategies, and Considerations

A. Key Findings

In sum, these analyses demonstrated that there are significant differences in performance on many of the quality measures included in the ESRD QIP, and that these differences appear to be associated with beneficiary social risk factors rather than facility factors. Because these measures are not clinically risk-adjusted, these differences may be driven by social risk, or by higher levels of medical risk in beneficiaries identified as having important social risk factors.

However, because of the way the ESRD QIP is currently constructed, only about 6% of facilities receive a financial penalty. Therefore, significant differences in performance between facilities with high versus low levels of social risk translate into very small absolute differences in the risk of being penalized.

B. Policy Analysis, Strategies, and Considerations

Policy options are simulated, and weighed against the policy criteria outlined in Chapter 1 to ultimately inform strategies and considerations for accounting for social risk.. Those policy criteria are reiterated in Table 11.9:

Table 11.9: Policy Criteria

Policy Criteria
1. Encourages reduction in disparities in quality and outcomes
2. Protects beneficiaries' access to care by reducing disincentives to caring for high-risk populations
3. Protects providers from unfair financial stress
4. Adjusts only for the difference in performance related directly to the social risk factor, and only for what is beyond provider control
5. Promotes transparency to facilitate consumer choice
6. Supports delivery system reform and Alternative Payment Models

How these criteria are weighed by policymakers could differ. For example, some may feel that protecting providers from unfair financial stress is the most important criterion, and may be willing to adjust for factors under providers' control or negatively impact transparency to achieve that goal. On the other hand, some may feel that transparency is the most important criterion, and argue that avoiding financial stress for providers or promoting delivery system reform are less important policy considerations.

Strategies and considerations are outlined below. They are, as in all program chapters in this report, organized into three broad strategies that best meet the policy criteria outlined in Chapter 1. 1) Measure and report quality for beneficiaries with social risk factors; 2) Set high, fair standards for all beneficiaries; and 3) Reward and Support Better Outcomes for Beneficiaries with Social Risk Factors.

STRATEGY 1: Measure and Report Quality for Beneficiaries with Social Risk Factors
Measurement and reporting are foundational for quality improvement in health care.

CONSIDERATION 1: Consider enhancing data collection and developing statistical techniques to allow measurement and reporting of performance for beneficiaries with social risk factors on key quality and resource use measures.

Measurement is a key component of both quality improvement in general and the provision of high-quality care in beneficiaries with social risk factors in particular.[21] The ability to measure and track quality, outcomes, and costs for beneficiaries with social risk factors over time is crucial as providers seek to reduce disparities and improve care for these groups to the greatest degree possible.

However, currently, there are areas in which data limitations make calculating and reporting performance for at-risk subgroups difficult. For measures currently collected on only a sample of patients, such as those related to patient experience, a strategy should be developed to capture data that would allow calculation and reporting of performance by important subgroups. This strategy would allow the Department and facilities, as well as consumers, to better-understand who performs well for dually-enrolled beneficiaries and where there are particular areas for targeted improvement. This is consistent with the policy goal of encouraging reductions in disparities in quality and outcomes, and also promotes transparency to facilitate consumer choice.

Alternate sampling methods may be necessary for stratified reporting for measures in which sample size is currently too small. Such methods could include stratified samples rolled over multiple measurement periods, for example.

When adequate data are available, key quality and resource use measures stratified by social risk should be developed and considered for dialysis facility feedback and/or public reporting, so that facilities, policymakers, and consumers can see and address important disparities in care. Reductions in disparities might be more easily achieved if measures were stratified so as to allow CMS and clinicians to track and address differences in performance on dialysis quality measures for socially-at risk beneficiaries. Particularly as the program moves increasingly to measures that, in other settings, have been shown to be particularly challenging for providers serving beneficiaries with social risk factors (patient experience and infection rates, for example), tracking group-specific performance may be a critical component of identifying disparities early and targeting them appropriately. Better monitoring of disparities could also promote consumer choice through greater transparency.

CONSIDERATION 2: When feasible, consider developing and introducing a new measure or domain on Achieving Health Equity to the ESRD QIP to assess and reward facility efforts to reduce health disparities.

The report on best practices for socially at risk beneficiaries from the National Academies of Sciences, Engineering, and Medicine recognized the prioritization of equity as a key strategy for health care organizations to deliver high-quality care to beneficiaries with social risk factors.[21] One way to prioritize equity is to provide targeted payment adjustments linked to equity. This may be achieved by adding a health equity measure or domain to existing programs.

A measure or domain for health equity could be added to the ESRD quality metrics to provide an explicit incentive and expectation of reducing health disparities for participants in the ESRD QIP. As there are no currently in-use health equity measures in the Medicare programs, this will require development and testing, and is not feasible in the short term. A measure of health equity may play an important role in ensuring that pay-for-performance programs help to incent, rather than disincent, improving care for beneficiaries with social risk factors. This approach would align with the policy criterion of encouraging reduction of disparities.

Specific approaches or measure(s) related to health equity have not been evaluated; however, a health equity domain could include performance on measures of disparity reduction, performance on outcomes for beneficiaries with social risk factors, or structural measures including systems practices that address the needs of beneficiaries with social risk factors. However, measures that would comprise such a domain have not been developed, and would need to be carefully constructed, tested, and validated prior to use.

CONSIDERATION 3: Prospectively monitor the financial impact of the ESRD QIP on providers disproportionately serving beneficiaries with social risk factors.

Prospectively monitoring the performance and financial impact of the ESRD QIP on providers serving a large proportion of beneficiaries with social risk factors is critical, including any unintended consequences of the program. This is particularly important as the program expands to include patient experience measures, infection measures, and additional outcome measures, on which dually-enrolled beneficiaries may have worse outcomes than their non-dually-enrolled peers.

STRATEGY 2: Set High, Fair Standards for All Beneficiaries

Given the overarching goal of improving care for all beneficiaries, providers should be held to high, fair standards regardless of the beneficiaries they serve.

CONSIDERATION 1: The measures used in the ESRD QIP should continue to be examined to determine if adjustment for social risk factors is appropriate.

There are a broad range of measures in the ESRD QIP, with even more to be added in future years. There is no over-arching recommendation in terms of adjusting or not adjusting these measures; instead, each should be considered in terms of the empirical relationship between social risk and outcomes and the pros and cons of such adjustment.

There are arguments both for and against adjustment of quality measures (and resource use measures, though none are currently included in the ESRD QIP). Adjusting for social risk factors in the measures themselves risks masking modifiable disparities in care or depending on how such adjustment were implemented, excusing providers delivering low-quality care to at-risk populations. Adjustment could also negatively impact transparency for consumers. Further, making changes to the current program or program measures to address issues of equity around social risk could potentially be a large burden to facilities and to CMS but would have little impact on penalties. On the other hand, failing to adjust where a relationship exists between the social risk factor and the outcome that is beyond the provider's control risks inappropriately penalizing providers, and potentially creating incentives for providers to limit access to care for beneficiaries perceived to be at high risk of adverse outcomes.

Currently, the only ESRD measure that is adjusted for social risk is the standardized mortality ratio. This measure is not included in the ESRD QIP at this time. The mortality measure is adjusted for race because Black beneficiaries have a lower risk of death during dialysis than non-Black beneficiaries. However, there are many other measures across Medicare's payment programs on which Black beneficiaries have significantly higher risk of poor outcomes, and those have not typically been adjusted for race. This measure should be re-examined in the context of current discussions around social risk. In terms of the policy criteria, this consideration could serve both to reduce disparities and promote transparency to facilitate consumer choice.

CONSIDERATION 2: Program measures should be studied to determine whether differences in health status might underlie the observed relationships between social risk and performance, and whether better adjustment for health status might improve the ability to differentiate true differences in performance between facilities.

Measures used in the ESRD QIP should be re-examined to determine if additional medical or social risk factors – in particular, functional status and measures of disease severity – could be added to the models to improve accuracy and fairness when applied to dialysis facilities. Dually-enrolled beneficiaries have health and social needs that may be more substantial and require more resources to address than non-dually-enrolled beneficiaries, such as lack of family or caregiver support, functional or cognitive limitations, and greater medical complexity. Thus, enhancing risk adjustment as feasible can help ensure that providers do not face undue financial stress, and reduce disincentives to caring for high-risk populations.

Particularly given that current data indicate that many of the facilities that serve high-risk populations may have worse performance when more outcome measures are added to the program, these measures should be explored further as outlined above.

STRATEGY 3: Reward and Support Better Outcomes for Beneficiaries with Social Risk Factors

One of the important findings in this chapter was the wide distribution of performance among providers disproportionately serving beneficiaries with social risk factors. This suggests that achieving better outcomes for these groups is feasible. However, in many cases it may require more effort on the part of providers, or more resources and more support, than achieving the same outcomes in a lower-risk population.

CONSIDERATION 1: Consider providing additional financial incentives to reward facilities that achieve high quality or significant improvement for beneficiaries with social risk factors.

Achievement and/or improvement in high-risk populations should be rewarded, and this could be done by adding targeted payment adjustments to existing value-based purchasing programs.

An additional payment adjustment could be created for facilities achieving high quality and serving a particularly socially at-risk population, as modeled above. Alternatively, specific payment adjustments could reward high performance and/or significant improvement in socially at-risk beneficiaries, regardless of the demographic makeup of the facility at which they receive care. This consideration has precedent in the Physician Value-based payment modifier Program and may provide additional protection against any incentives that the shared savings model may create to avoid caring for high-risk beneficiaries. This consideration is also consistent with the policy goals of protecting providers from unfair financial stress and encouraging reductions in disparities in quality and outcomes.

CONSIDERATION 2: Consider using existing or new quality improvement programs to provide targeted technical assistance to facilities that disproportionately serve beneficiaries with social risk factors to improve quality and ensure they can successfully participate in the reporting required for the ESRD QIP.

The majority of the dialysis facilities that received the full negative payment adjustment were likely those which failed to report on many measures, since the scores were too low to be explained by poor measure performance alone. As these facilities disproportionately cared for beneficiaries with social risk factors, targeting efforts at those facilities to improve their ability to report quality and outcomes – particularly given that it can be very difficult to improve what one can't measure – may be a critical component of improving the quality of care delivered to at-risk populations and at reducing the financial stress they may experience due to failure to report.

CONSIDERATION 3: Consider developing demonstrations or models focusing on care innovations that may help achieve better outcomes for beneficiaries with social risk factors.

It is also feasible that demonstration programs, such as the recently-launched Comprehensive ESRD Care Model from CMMI, could help Medicare learn more about what types of care might achieve the best outcomes for ESRD beneficiaries. For example, demonstration programs could include consideration of targeted interventions for dually-enrolled individuals, modeled on the successes found in Medicare Advantage plans that have focused on integrating benefits and supports across Medicare and Medicaid to support beneficiaries with social risk factors.[22,23] Dialysis facilities provide very frequent care to their beneficiaries, and therefore may actually represent a particularly viable "medical home" from which additional support services could be effectively delivered. Given that there is a growing body of evidence supporting care coordination, social work, visiting nurse, and patient engagement/self-management programs to help reduce admissions and readmissions for high-risk beneficiaries,[24] these services could be explored for through demonstration programs for appropriate groups.

CONSIDERATION 4: Consider further research to examine the costs of caring for beneficiaries with social risk factors and to determine whether current payments adequately account for these differences in care needs.

Finally, payment policies should be examined in light of experience in other settings with beneficiaries with social risk factors. The ESRD setting pays in a bundled fashion based in part on medical risk, but does not provide additional payments for providers based on the social risk profile of its beneficiaries, though this is done in some other care settings – most notably the DSH payments awarded to hospitals based on the social risk profile of hospitalized individuals. It is currently unknown whether or not payments based on medical risk adequately account for any differences in the costs of providing ESRD care to socially-at risk individuals. Additional analyses should examine this issue.

VII. References

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CHAPTER 12: Skilled Nursing Facilities

In This Chapter:

- ***Is there a relationship between beneficiary social risk and performance on quality measures in the Skilled Nursing Facility (SNF) setting?***
- ***Is there a relationship between SNF social risk profile and performance on these metrics?***

This chapter presents findings on the relationship between beneficiary or facility social risk and performance under readmission measures relevant to the skilled nursing facility (SNF) setting.

Key Findings:

- Analyses showed that beneficiaries at high social risk were much more likely to be re-hospitalized during the first 30 days of a SNF stay. However, after applying the risk adjustment variables to the model, these effects were significantly smaller, and the effect of dual enrollment disappeared.
- Similarly, by raw readmission rates, being at a SNF with a high proportion of dually-enrolled, low-income, Black, or Hispanic beneficiaries, or beneficiaries with disabilities, was associated with an increased likelihood of re-hospitalization during the first 30 days of a SNF stay, regardless of a beneficiary's social risk. This result decreased with CMS risk adjustment, but remained significant.
- The exception to these findings was for rural beneficiaries and rural SNFs, where readmission rates were lower than in urban settings, but results were not statistically significant.
- When beneficiary and provider social risk factors were included in a single model, the provider level effect was in general larger than the beneficiary level effect.

Strategies and Considerations for the SNF setting

SUMMARY OF STRATEGIES AND CONSIDERATIONS
STRATEGY 1: Measure and Report Quality for Beneficiaries with Social Risk Factors
CONSIDERATION 1: Consider developing SNF readmission measures and/or statistical approaches suitable for reporting of performance for beneficiaries with social risk factors, where feasible.
CONSIDERATION 2: When feasible, consider developing and introducing a new measure or domain on Achieving Health Equity to the SNF VBP program to assess and reward facility efforts to reduce health disparities.

CONSIDERATION 3: Consider increasing the number of metrics included in SNF VBP to be more reflective of a broader agenda for improving quality in this setting.
CONSIDERATION 4: As SNF VBP is implemented, consider prospectively monitoring for potential unintended consequences. Specifically, the potential for reducing access to care for beneficiaries perceived to be at high risk of readmission, such as dually-enrolled beneficiaries, beneficiaries with disabilities or individuals with multiple comorbidities, should be tracked.
STRATEGY 2: Set High, Fair Standards for All Beneficiaries
CONSIDERATION 1: The SNF readmission measure should continue to be examined to determine if adjustment for social risk factors is appropriate.
CONSIDERATION 2: Program measures should be studied to determine whether differences in health status might underlie the observed relationships between social risk and performance, and whether better adjustment for health status might improve the ability to differentiate true differences in performance between providers.
STRATEGY 3: Reward and Support Better Outcomes for Beneficiaries with Social Risk Factors
CONSIDERATION 1: Consider providing additional financial incentives to reward skilled nursing facilities that achieve high quality or significant improvement for beneficiaries with social risk factors.
CONSIDERATION 2: Consider using existing or new quality improvement programs to provide targeted technical assistance to skilled nursing facilities that disproportionately serve beneficiaries with social risk factors to help improve quality.
CONSIDERATION 3: Consider developing demonstrations or models focusing on care innovations that may help achieve better outcomes for beneficiaries with social risk factors.
CONSIDERATION 4: Consider further research to examine the costs of caring for beneficiaries with social risk factors and to determine whether current payments adequately account for these differences in care needs.

I. Introduction

A. Background

Medicare post-acute care (PAC) services are primarily provided to beneficiaries for rehabilitation or recuperation in the course of treating an illness or injury, with a large proportion of these services initiated after an acute hospital stay.[1,2] Medicare PAC services are commonly provided by a skilled nursing facility (SNF), home health agency (HHA), inpatient rehabilitation facility (IRF), or long-term care hospital (LTCH). This chapter focuses on PAC services provided in SNFs.

In order for Medicare to cover services in an SNF, among other requirements, eligible beneficiaries must require daily skilled nursing or rehabilitation services and have a qualifying three-day prior inpatient hospital stay. For beneficiaries who meet all Medicare coverage criteria, Medicare Part A covers care in a SNF for up to 100 days in a benefit period, with Medicare paying for all covered services for days 1-20 and beneficiaries paying daily coinsurance for days 21-100.

SNFs, like hospitals, are paid under a prospective payment system (PPS). SNF PPS was implemented in 1998 using a per diem payment approach. SNFs are paid an urban or rural Federal per diem rate based on the location of the SNF in a core-based statistical area (CBSA) (i.e., urban) or non-CBSA area (i.e., rural), adjusted for the patient's clinical characteristics and care needs. The labor portion of the per-diem rate is adjusted for geographic differences in wages.

In recent years, there has been a significant shift in the SNF setting toward measurement, reporting, and payment based on quality. As part of the CMS Nursing Home Quality Initiative,[3] CMS reports SNF quality metrics on its Nursing Home Compare website[4] to help consumers choose high quality providers. This website includes measures such as the percentage of residents with new or worsened pressure ulcers and the percentage of residents experiencing one or more falls with major injury. Based on these and other measures as well as other factors, CMS assigns a star rating to each SNF on the website.

The IMPACT ACT (PL 133-185) requires CMS to implement a pay-for-reporting program for SNFs, and beginning with fiscal year 2018, CMS will reduce a SNF's market basket index percentage for a fiscal year by 2 percentage points if the SNF does not submit the data specified under the program.[xi] SNFs will also be required to participate in a value-based purchasing (VBP) program implemented under Section 215 of the Protecting Access to Medicare Act of 2014 (PL 113-93.[xii] Under the SNF VBP, CMS will initially make value-based incentive payments to SNFs based on their performance on an SNF all-cause, all-condition hospital readmission measure specified by the Secretary.

[xi] Under Section 1888(e)(6)(A)(i) of the Act, beginning with fiscal year 2018 and each subsequent fiscal year, the Secretary shall reduce the market basket update by 2 percentage points for any SNF that does not comply with data submission requirements with respect to that fiscal year.

[xii] Part of section 215 of the Protecting Access to Medicare Act of 2014 (Pub. L. 113-93, enacted April 1, 2014). The new law added subsections (g) and (h) to section 1888 of the Act.

CMS does not have the authority to adopt additional measures in the SNF VBP beyond those specified in sections 1888 (g)(1) and (2) of the Act. After a public solicitation of comments on aspects of the SNF VBP in the fiscal year 2016 proposed[xiii] and final[xiv] SNF PPS rules, the SNF 30-day All-Cause Readmission Measure (NQF #2510) was finalized as the measure that will be adopted in the initial SNF VBP program.[xv] For that reason, this chapter examines the relationships between social risk factors and performance on this measure in particular. However, additional measures are currently under development and may warrant exploration in future work.

B. Existing Research on Differences in SNF Readmissions based on Social Risk Factors

As the SNF VBP program is not yet in existence, there is no direct evidence of the impact of such a program on SNFs that serve beneficiaries of high social risk. There has been relatively little research on the relationship between social risk factors and readmissions or other outcomes in the post-acute setting more generally. However, a small number of prior studies suggest that racial and ethnic minorities may be more likely to go to low-quality skilled nursing facilities and have higher readmission rates at these facilities.[5-7] This research suggests that Medicaid-eligible beneficiaries tend to be admitted to lower-quality skilled nursing facilities than non-dually-enrolled beneficiaries,[8] and have lower access to home and community-based services for post-acute care.[9] It also suggests that rural beneficiaries may be more likely to be admitted to low-quality nursing homes,[10] although readmission rates from home health settings are lower in rural areas.[11]

C. Limitations

For this chapter in particular, there is no Medicare VBP program to model, but rather a program based on an existing measure for which scoring and payment adjustments have not started. The final specifications of how performance on the measure will be translated into payment adjustments are not yet determined; thus, the Chapter focuses on performance on the 30-day unplanned readmission measure.

D. Framework for the Chapter: Analytic Findings, Policy Simulations, Strategies, and Considerations

The remainder of this chapter is structured as follows. First, it describes underlying relationships between social risk and performance on the SNF readmission measure. Next, it examines the performance of facilities serving beneficiaries with social risk factors on this measure, and provides an analysis of the relative contributions of beneficiary versus provider factors in readmissions. Finally, strategies and considerations are presented, using the strategic framework outlined in Chapter 1: 1) measure and report quality for beneficiaries with social risk factors; 2) set high, fair standards for all beneficiaries; and 3) reward and support better outcomes for beneficiaries with social risk factors. These three strategies build on each other to address social risk in Medicare payment programs.

[xiii] 80 Fed. Reg. 22058
[xiv] 80 Fed. Reg. 46409
[xv] Additional details on the parameters of the SNF VBP will be implemented through future rulemaking.

II. Beneficiary and Provider Characteristics

A. Beneficiary Characteristics

The parameters outlined in Chapter 2 were used to define social risk factors, examining dually-enrolled, low-income ZCTA, Black, Hispanic, and rural beneficiaries, and beneficiaries with disabilities. One distinction between this chapter and previous ones is that in the post-acute setting, rural is defined using CBSA rather than metropolitan statistical area (MSA). As discussed above, SNFs are paid a standardized urban or rural Federal per diem rate based on the location of the SNF in a CBSA or non-CBSA area, and the labor portion of the per diem rate is adjusted for geographic differences in wages.

The patient population included in the SNF readmission measure tends to be older and sicker than Medicare beneficiaries as a whole. As shown in Table 12.1 below, moreover, the SNF beneficiaries at high social risk tend to have even higher burdens of comorbidities than their lower-risk counterparts.

Table 12.1: SNF Beneficiary Population, Fiscal Year 2014

		Overall Population	Dually-Enrolled	Low-income ZCTA	Black	Hispanic	Rural (Non-CBSA)	Originally entitled to Medicare on the basis of disability
N		1,725,721	564,671	356,969	176,969	73,660	169,289	383,551
% of population		100.0%	32.7%	20.7%	10.3%	4.3%	9.8%	22.2%
Median age		80	76	78	75	77	80	67
Female		62.7%	64.3%	62%	59.3%	57.9%	63.5%	54.7%
Mean risk score		1.72	2.20	1.84	2.21	2.09	1.53	2.35
% of stays by number of HCC comor-bidities	0	2.3%	1.2%	1.8%	1.5%	2.1%	2.6%	1.7%
	1	4.7%	2.9%	4.1%	3.4%	4.3%	5.4%	3.6%
	2	6.4%	4.6%	6.0%	4.8%	5.8%	7.4%	5.2%
	3 - 5	23.0%	19.6%	21.8%	18.3%	20.3%	25.0%	19.3%
	6 - 9	28.0%	28.1%	27.9%	26.3%	26.1%	28.1%	26.2%
	10 +	35.6%	43.6%	38.5%	45.7%	41.4%	31.5%	44.0%

CBSA=core-based statistical area; HCC=hierarchical condition category; ZCTA=ZIP code tabulation area

B. SNF Characteristics

As described in Chapter 2, SNFs serving populations at high social risk were defined by designating the top quintile of SNFs in terms of their proportion of dual, poor, low income ZCTA, Black, or Hispanic beneficiaries, or beneficiaries with disabilities. SNFs located in a non-CBSA were designated as rural. The sample of these high social risk facilities included 16,651 SNFs. Their characteristics are shown in Table 12.2. On average, SNFs that served a high proportion of high-social-risk beneficiaries were more likely to be for-profit and urban. While 20% of SNFs overall received a 5-star rating, only about 10-14% of SNFs

serving high-social-risk populations received a five-star rating, with the exception of SNFs serving a high proportion of Hispanic beneficiaries, of which 19% received five stars.

Table 12.2: SNF Characteristics, Fiscal Year 2014

Provider Characteristics		Overall	High Dually-enrolled	Low-income ZCTA	High Black	High Hispanic	Rural (Non-CBSA)	High Disabled
# of providers		16,661	3,328	3,338	3,337	3,336	3,721	3,329
# of stays		1,725,721	198,197	241,440	344,077	347,309	166,376	214,342
Beds (median)		99	102	96	120	114	55	104
For-profit		65%	84%	68%	81%	81%	40%	85%
Urban (CBSA)		78%	85%	61%	88%	91%	0%	85%
High PAC*		22%	37%	19%	37%	41%	0%	30%
Star ratings	*1*	14%	24%	17%	22%	16%	8%	27%
	2	17%	24%	17%	23%	21%	10%	24%
	3	17%	18%	17%	19%	18%	12%	17%
	4	21%	17%	18%	18%	20%	13%	16%
	5 (best)	20%	14%	14%	13%	19%	13%	10%
	NA†	11%	3%	17%	5%	5%	44%	6%

CBSA=core-based statistical area; ZCTA=ZIP code tabulation area
*: A High PAC area is defined as the availability of four Medicare PAC provider settings (i.e., Medicare SNF, HHA, LTCH and IRF) in a given CBSA or non-CBSA area. †: A missing SNF star-rating can be due to: 1) the facility not being open long enough, 2) the facility being too small to receive a rating, 3) the facility being a swing-bed facility

III. Beneficiary Social Risk Factors and Performance on the 30-Day Readmission Measure

The SNF 30-day hospital readmission measure focuses on all-cause, all-condition, unplanned inpatient hospital readmissions of Medicare SNF beneficiaries within 30 days of discharge from an admission to an IPPS hospital, critical access hospital, or psychiatric hospital. The 30-day risk window for re-hospitalization starts on the discharge date of the prior proximal hospitalization. The SNF 30-day hospital readmission measure only includes unplanned hospital readmissions, and is risk-adjusted using, among other factors, patient demographics, length of stay, and intensive care unit (ICU) time during the prior proximal hospitalization, disability and ESRD status at the time of Medicare enrollment, and a variety of co-morbidities. Please see the Appendix to this chapter for full measure methodology.

A. Individual Social Risk Factors and Risk of Readmission

Table 12.3 shows the results of beneficiary-level analyses examining individual social risk factors and readmission rates, using fiscal year 2014 data. Dually-enrolled beneficiaries (the first row in the "in-group" column) had a raw readmission rate of 18.5% during the first 30 days of SNF care, compared to 16.3% for non-dually-enrolled beneficiaries (the "not in group" column). Overall, dually-enrolled

beneficiaries had 17% higher odds of readmission than non-dually-enrolled beneficiaries. Findings were similar for the other social risk factors, with the exception of rural, for which the odds of readmission was lower.

Table 12.3: Beneficiary Level Social Risk Factors and Readmission Rates, Fiscal Year 2014

SES Factor	In-Group Rates	Not-in-Group Rates	Odds Ratio*
Dually-Enrolled	18.5%	16.3%	**1.17**
Low-Income ZCTA	18.4%	16.6%	**1.13**
Black	20.8%	16.6%	**1.32**
Hispanic	19.0%	16.9%	**1.16**
Rural	16.2%	17.1%	**0.94**
Disability	19.3%	16.3%	**1.22**

*Odds greater than one indicated greater risk of readmission. Bolded odds are significant at p<0.05. Odds ratio was calculated from a generalized estimating equations model with independent correlation matrix, which gives the total (both within-SNF and between-SNF) effect of the social risk factor in each row. The tables are color-coded to communicate the directionality of the relationships with red indicating poorer performance and green indicating better performance.

When these relationships were modeled using a random effects model, which isolated the within-facility effect of the social risk factor, the odds of readmission dropped from 1.17 to 1.10 for dually-enrolled beneficiaries (Table 12.4). This suggests that within the same SNF, a dually-enrolled beneficiary had 10% higher odds of readmission than a non-dual at that same facility. When risk adjustment variables were added to the model, including age, gender, and comorbidities, the findings actually reversed for dually-enrolled beneficiaries: after risk adjustment, dually-enrolled beneficiaries were 3% less likely to be re-hospitalized than non-dually-enrolled beneficiaries. For the other social risk factors, the effects similarly became smaller after adding risk adjustment variables, though they generally remained significant. When all six factors were included in a single model, there was very little change in the odds associated with each factor, suggesting that the contribution of each of the social risk factors was largely independent (Table 12.4):

Table 12.4: Within-Facility Relationships between Social Risk Factors and Readmission, 2014

SES Factor	Odds Ratio from Random Effects Model	Odds Ratio from Random Effects Model with Risk Adjustment	Odds Ratio from Random Effects Model with Risk Adjustment and all SES Factors Included
Dually-enrolled	**1.10**	**0.97**	**0.96**
Low-Income ZCTA	**1.10**	**1.05**	**1.05**
Black	**1.24**	**1.07**	**1.07**
Hispanic	**1.10**	**1.03**	**1.06**
Rural	**0.96**	1.01	1.01
Disability	**1.18**	**1.02**	**1.03**

Odds greater than one indicated greater risk of readmission. Bolded odds are significant at p<0.05. Random effects models include a term for social risk makeup of the SNF, in order to isolate the within-facility effect of the social risk factor in question.

In summary, these analyses associated dual enrollment with slightly lower odds of readmission and Black, Hispanic, low-income, and disability status with higher odds of readmission in the first 30 days of a SNF stay following an index hospitalization, although the within-SNF effects after risk adjustment were small.

IV. SNF Social Risk Levels and Readmission Rates

A. SNF Social Risk Levels and Readmission Rates

The next question was whether SNFs serving a high proportion of beneficiaries with social risk factors had higher unplanned 30-day readmission rates for their beneficiaries overall. Table 12.5 shows the results of the patient level analyses, using fiscal year 2014 data. Patients at high-dual SNFs (first row in the in-group column) had a raw readmission rate of 19.8% during the first 30 days of SNF care, compared to 16.6% for beneficiaries at non-high-dual SNFs (the "not-in-group" column). This was equivalent to 23% higher odds of readmission than beneficiaries not at high-dual SNFs. Findings were similar for SNFs with a high proportion of beneficiaries with the other social risk factors, with the exception of rural SNFs serving a high proportion of high social risk beneficiaries, for which the odds of readmission was lower.

When risk adjustment variables were added to the model, including age, gender, and comorbidities, the size of the effects were reduced, but largely remained significant, with the exception of rural SNF location, which was not associated with readmission rates after risk adjustment.

Table 12.5: SNFs Serving a High Proportion of High Social Risk Beneficiaries, Fiscal Year 2014

SNF Type	In-Group Rates	Not-in-Group Rates	Odds Ratio*	Odds Ratio with Risk Adjustment
High-Dual	19.8%	16.6%	**1.23**	**1.10**
Low-Income ZCTA	18.3%	16.8%	**1.11**	**1.08**
High-Black	19.7%	16.3%	**1.27**	**1.12**
High-Hispanic	18.3%	16.7%	**1.13**	**1.04**
Rural	15.7%	17.1%	**0.88**	1.01
High-Disabled	19.5%	16.6%	**1.22**	**1.05**

Odds greater than one indicated greater risk of readmission. Bolded odds are significant at $p<0.05$. *Odds ratios are calculated from random effects models; in this case since the characteristic in question is a SNF, the odds from a random effects model gives the average effect for a patient being at that type of SNF (i.e., high-dual) versus another type of SNF (non-high-dual).

In summary, these analyses show that beneficiaries cared for at SNFs with a high proportion of beneficiaries at high social risk are more likely to be readmitted in the first 30 days of a SNF stay following an index hospitalization, and that these effects persist, though to a lesser degree, after risk adjustment.

B. Comparison of Individual Beneficiary versus SNF Social Risk Factors and Readmission Rates

Finally, to determine whether beneficiary or SNF characteristics were the dominant factor in determining readmission rates, regression models were run that included beneficiary and provider level

characteristics in the same model. In Table 12.6, the middle column shows the odds of re-hospitalization when each factor was examined independently. These values are the same as those found in tables 12.4 and 12.5. In the rightmost column, each beneficiary level social risk factor and SNF indicator was added in the same model to examine the relative contribution of beneficiary and provider factors.

In general, these results suggest that the provider-level factors are more powerful predictors of readmissions than the beneficiary-level factors. For example, in the first two rows, dual enrollment was associated with a 4% lower odds of readmission, while being at a high-dual SNF was associated with a 12% higher odds of readmission; because these estimates did not change very much when going from the models in which these factors are considered separately (middle column) to the models in which they are considered together (right column), the two factors were largely independent of each other. These findings were relatively similar across social risk factors, with the exception of rural patient and provider location, which had no relationship to SNF readmissions.

Table 12.6: Beneficiary versus Provider Factors in Readmissions

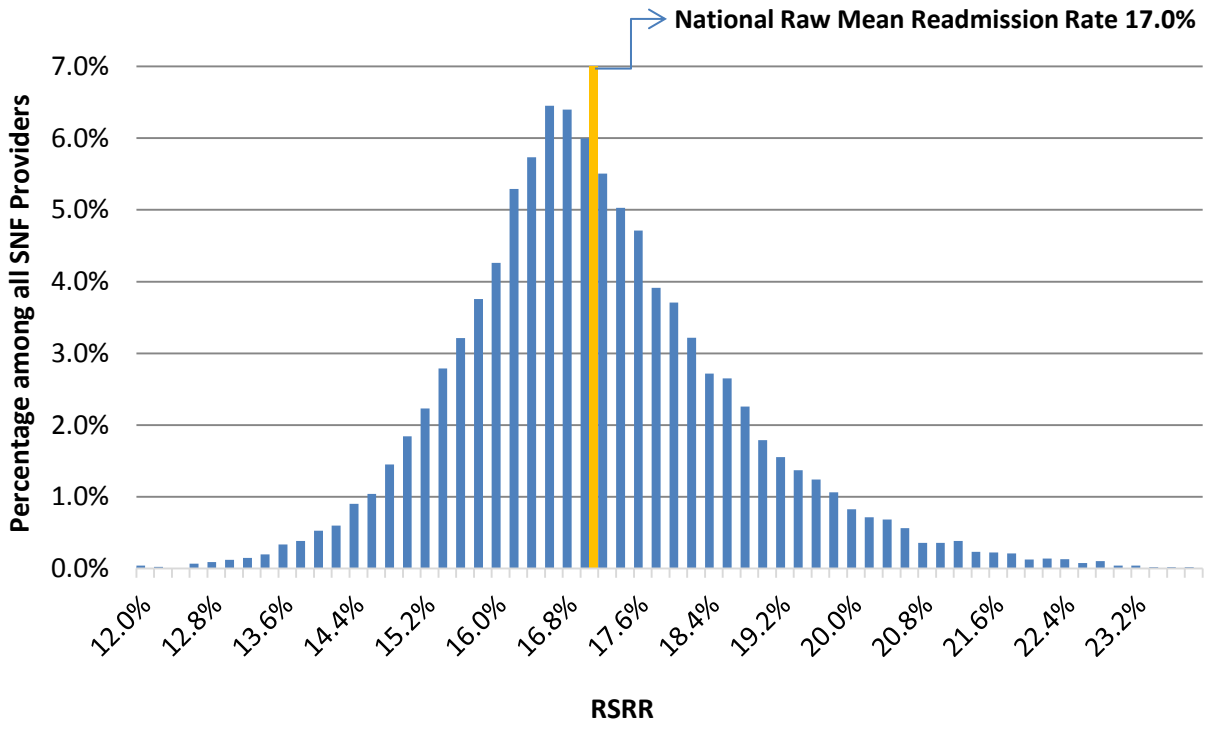
Beneficiary or Provider Level Factor	Models Run Separately for Beneficiary and Provider Factors	Models Run with Beneficiary and Provider Factors in same model
Dually-Enrolled – Beneficiary	**0.97**	**0.96**
High-Dual – Provider	**1.10**	**1.12**
Low-Income ZCTA – Beneficiary	**1.05**	**1.04**
Low-Income ZCTA - Provider	**1.08**	**1.05**
Black – Beneficiary	**1.07**	**1.03**
High-Black - Provider	**1.12**	**1.11**
Hispanic- Beneficiary	**1.03**	**1.02**
High-Hispanic - Provider	**1.04**	**1.04**
Rural – Beneficiary	1.01	1.01
Rural – Provider	1.01	1.00
Disability – Beneficiary	**1.02**	**1.02**
High-Disabled - Provider	**1.05**	**1.05**
Odds greater than one indicated greater risk of readmission. Bolded odds are significant at $p<0.05$. All models are random effects models with full risk-adjustment variables included.		

V. SNF-Level Performance Analyses

The results shown thus far are beneficiary-level analyses examining the relationship between social risk factors and odds of readmission. However, for use in a SNF VBP program, the measure would be aggregated to the SNF level. Facility performance was therefore examined by expressing SNF

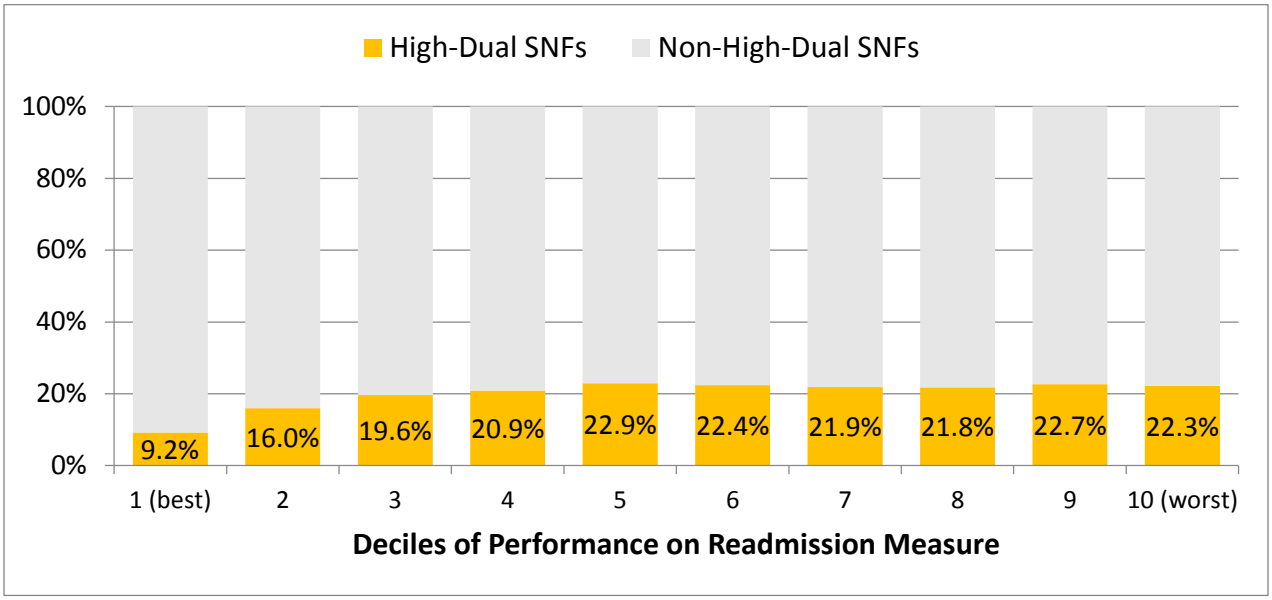
performance on the readmission measure as a risk standardized readmission rate (RSRR). The RSRR is the predicted number of readmissions divided by the expected number of readmissions multiplied by the national raw mean hospital readmission rate.[12] The fiscal year 2014 national raw readmission rate was 17.0%; the distribution of RSRR measure performance for all SNFs in fiscal year 2014 is shown in Figure 12.1.

Figure 12.1: Distribution of Risk-Standardized Readmission Rate (RSRR) Measure Performance



One way to model potential impact of a program is to examine the distribution of facilities into performance groups. In the figure below, SNFs were broken into deciles by RSRR, and the proportion of each group comprised of high-dual SNFs is shown (Figure 12.2); high-dual SNFs were under-represented in the best-performing group, and over-represented in the worst-performing groups:

Figure 12.2: Distribution of High-Dually-enrolled SNFs in Deciles of Performance on Readmissions



However, there were high-dual SNFs represented in every decile of performance, including the best performing group.

VI. Policy Options

The focus of this chapter is on the relationships between social risk factors and performance on the 30-day SNF readmission measure, as discussed above. This chapter does not simulate specific policy options, but instead focuses on considerations for the ongoing development of a national SNF VBP.

VII. Key Findings, Strategies, and Considerations

A. Key Findings

Underlying relationships:

- Analyses showed that beneficiaries at high social risk were much more likely to be re-hospitalized during the first 30 days of a SNF stay. However, after applying the risk adjustment variables to the model, these effects were significantly smaller, and the effect of dual enrollment disappeared.
- Similarly, by raw readmission rates, being at a SNF with a high proportion of dual, low-income, Black, Hispanic, or disabled beneficiaries was associated with an increased likelihood of re-hospitalization during the first 30 days of a SNF stay, regardless of a patient's social risk. This result decreased with CMS risk adjustment, but remained significant.

- The exception to these findings was for rural beneficiaries and rural SNFs, where readmission rates were lower than in urban settings, but the results were not statistically significant.
- When patient and provider social risk factors were included in a single model, the provider level effect was in general larger than the patient level effect.

B. Policy Analysis, Strategies, and Considerations

As discussed above, the SNF chapter does not include specific policy options or simulations, but rather focuses on considerations relevant to the development of a future national SNF VBP program. The considerations are made in light of the policy criteria outlined in Chapter 1, and reiterated in Table 12.7:

Table 12.7: Policy Criteria

Policy Criteria
1. Encourages reduction in disparities in quality and outcomes
2. Protects beneficiaries' access to care by reducing disincentives to caring for high-risk populations
3. Protects providers from unfair financial stress
4. Adjusts only for the difference in performance related directly to the social risk factor, and only for what is beyond provider control
5. Promotes transparency to facilitate consumer choice
6. Supports delivery system reform and Alternative Payment Models

STRATEGY 1: Measure and Report Quality for Beneficiaries with Social Risk Factors
Measurement and reporting are foundational for quality improvement in health care.

CONSIDERATION 1: Consider developing SNF readmission measures and/or statistical approaches suitable for reporting of performance for beneficiaries with social risk factors, where feasible.
Measures stratified into subgroups could allow CMS and clinicians to track and address disparities in readmission rates for beneficiaries at high social risk. Doing so may increase the ability to target quality improvement efforts at groups that may benefit most from such intervention.

CONSIDERATION 2: When feasible, consider developing and introducing a new measure or domain on Achieving Health Equity to the SNF VBP program to assess and reward facility efforts to reduce health disparities.
The report on best practices for socially at risk beneficiaries from the National Academies of Sciences, Engineering, and Medicine recognized the prioritization of equity as a key strategy for health care organizations to deliver high-quality care to beneficiaries with social risk factors.[13] To further highlight the importance of health equity and to focus agencies' attention on reducing disparities, creating a health equity measure or domain could also be considered if the SNF quality metric list were to be broadened. This would enhance incentives to deliver high-value care to all

beneficiaries, including beneficiaries with social risk factors. This approach would be particularly consistent with the policy criterion of encouraging reduction of disparities. A health equity domain could include performance on measures of disparity reduction, performance on outcomes for beneficiaries with social risk factors, or structural measures including systems practices that address the needs of beneficiaries with social risk factors. However, measures that would comprise such a domain have not been developed, and would need to be carefully constructed, tested, and validated prior to use.

CONSIDERATION 3: Consider increasing the number of metrics included in SNF VBP to be more reflective of a broader agenda for improving quality in this setting.

As mentioned above, the current statutory parameters governing the national SNF VBP specify that the program only includes one measure; in order to provide a more thorough assessment of SNF quality for consumers, and to incent broader improvements in quality, additional measures may be of use. Exploration of additional domains and measures should be considered such as those measures included in SNF quality reporting program and reported on nursing home compare. The FY 2017 President's Budget includes a legislative proposal to implement value-based purchasing for additional providers, which could potentially be used to add measures to the future SNF VBP.

CONSIDERATION 4: As SNF VBP is implemented, consider prospectively monitoring for potential unintended consequences. Specifically, the potential for reducing access to care for beneficiaries perceived to be at high risk of readmission, such as dually-enrolled beneficiaries, beneficiaries with disabilities or individuals with multiple comorbidities, should be tracked.

Because in many cases SNFs have the opportunity to screen and either accept or deny beneficiaries based on clinical, financial, or other characteristics, value-based purchasing programs could potentially reduce access to SNF care for populations perceived to be at high risk of readmission or other poor outcomes. The potential for this unintended consequence should be carefully monitored.

STRATEGY 2: Set High, Fair Standards for All Beneficiaries

Given the overarching goal of improving care for all beneficiaries, providers should be held to high, fair standards regardless of the beneficiaries they serve.

CONSIDERATION 1: The SNF readmission measure should continue to be examined to determine if adjustment for social risk factors is appropriate.

Similar to findings in other settings (hospitals, ACOs, physician groups), raw readmission rates in the SNF setting were much higher for populations with social risk factors. However, in contrast to other settings, these effects were almost entirely accounted for by the risk adjustment models.

The two potential explanations for this discrepancy cannot be differentiated using current data. First, it is possible that the SNF readmission measure does a better job measuring comorbidities than the hospital, ACO, or physician value-based modifier readmission measures; as dually-enrolled beneficiaries are typically sicker and more medically complex, better measurement of comorbidities may reduce the residual effect of dual enrollment. This is a plausible explanation given that the SNF readmission measure includes a host of variables not included in other settings, such as whether an individual is disabled, whether prior hospitalizations included an ICU stay, and whether other hospital utilizations occurred earlier in the year, in addition to a comorbidity burden variable. From this perspective, the higher underlying medical risk of the SNF population may explain, or underlie, much of the effect of high social risk in this population. This may have implications for the design or update of readmission measures in other settings.

It is also possible that something about the SNF setting itself differs from other settings. When beneficiaries are discharged to SNFs, their environments are controlled – all beneficiaries at a SNF have access to shelter, food, their medications, and a degree of medical and other services and supports that may not always be available or available consistently in the home. It is therefore possible that the reason the results do not yield major differences in readmission rates between dually-enrolled beneficiaries and non-dually-enrolled beneficiaries is because this common environment may meet needs that may go unmet in other environments.

The finding that there is a significant facility effect – i.e., beneficiaries at SNFs with a high proportion of high risk beneficiaries do more poorly, regardless of the patient's individual social risk – supports this latter hypothesis. In an environment in which the facility is controlling medications and medical evaluation, differences in quality may be more readily translated into differences in readmission rates, as opposed to the hospital setting, where readmissions by definition occur after beneficiaries have left the building. The fact that low-quality facilities tended to have higher readmission rates irrespective of an individual patient's socioeconomic circumstances supports this possibility as well.

CONSIDERATION 2: Program measures should be studied to determine whether differences in health status might underlie the observed relationships between social risk and performance, and whether better adjustment for health status might improve the ability to differentiate true differences in performance between providers.

As the SNF VBP program is developed, the measure will change from the current SNF readmission measure to a potentially preventable readmission measure. Particularly given the findings outlined in Consideration 1, the new measure should be studied to understand the relationships between complexity, frailty, disability, and functional status and potentially preventable readmissions.

STRATEGY 3: Reward and Support Better Outcomes for Beneficiaries with Social Risk Factors

One of the important findings in this chapter was the wide distribution of performance among providers disproportionately serving beneficiaries with social risk factors. This suggests that achieving better outcomes for these groups is feasible. However, in many cases it may require more effort on the part of providers, or more resources and more support, than achieving the same outcomes in a lower-risk population.

CONSIDERATION 1: Consider providing additional financial incentives to reward skilled nursing facilities that achieve high quality or significant improvement for beneficiaries with social risk factors.

One way to prioritize improving outcomes in beneficiaries with social risk factors is to provide targeted payment adjustments. Providing such incentives for SNFs that achieve good outcomes in high-risk populations, be they medically or socially high-risk, could both reduce the disincentive to caring for high-risk groups and recognize that it might be more challenging to achieve low rates of readmission in high-risk populations. This consideration would provide additional reward and/or recognition to SNFs that are able to achieve a quality standard for socially or medically at-risk populations.

Parameters of such an award would need to be determined; one possible model is the bonus in the current Physician Value-based payment modifier program, which awards high-performing practices an additional bonus if they have a particularly medically complex patient population; such an approach could be extended to those facilities with a particularly socially complex population. Alternatively, a payment adjustment could be developed that provided incentives specifically for high performance or improvement in beneficiaries with social risk factors, regardless of the overall population of the facility. Such bonuses could be scaled such that they reflected the proportion of beneficiaries with social risk factors at each facility.

The advantage of this approach is that it provides SNFs an additional incentive to focus on achieving good outcomes in at-risk beneficiaries, which may help reduce disparities in care and outcomes more broadly. One disadvantage is that such a bonus may only reward those high performing SNFs and not "lift all boats" or help lower performing SNFs who are serving a higher proportion of high-risk beneficiaries. Policymakers would need to decide whether the option would be implemented in a budget neutral fashion. A bonus payment could be provided as an additional payment in a non-budget neutral manner or funded via withholds from lower performing providers within the program under a budget-neutral approach.

CONSIDERATION 2: Consider using existing or new quality improvement programs to provide targeted technical assistance to facilities that disproportionately serve beneficiaries with social risk factors to help improve quality.

The findings presented here suggest that particular attention will need to be paid to facilities that serve a high proportion of dually-enrolled beneficiaries or beneficiaries with disabilities, or racial or ethnic minorities, as these facilities may face financial penalties under a SNF VBP program. Quality

improvement efforts focused on reducing readmission rates should be targeted at these facilities, and best practices shared and disseminated from the facilities serving high proportions of high-social-risk beneficiaries that do achieve good outcomes, where feasible. Such efforts may have the potential to reduce disparities as well.

CONSIDERATION 3: Consider developing demonstrations or models focusing on care innovations that may help achieve better outcomes for beneficiaries with social risk factors.

Demonstration programs could help Medicare learn more about what types of care might achieve the best outcomes for beneficiaries requiring post-acute SNF care. For example, demonstration programs could include consideration of targeted interventions for dually-enrolled individuals, modeled on the successes found in Medicare Advantage plans that have focused on integrating benefits and supports across Medicare and Medicaid, particularly those who might be at risk for long-term institutionalization.

CONSIDERATION 4: Consider further research to examine the costs of caring for beneficiaries with social risk factors and to determine whether current payments adequately account for these differences in care needs.

Finally, payment policies should be examined. The SNF setting pays in a bundled fashion based in part on medical risk, but does not provide additional payments for providers based on the social risk profile of its beneficiaries, though this is done in some other care settings – most notably the DSH payments awarded to hospitals based on the social risk profile of hospitalized individuals. It is currently unknown whether or not payments based on medical risk adequately account for any differences in the costs of providing post-acute care to beneficiaries with social risk factors. Additional analyses should examine this issue.

VIII. References

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CHAPTER 13: Home Health Agencies

In This Chapter:

- ***Is there a relationship between beneficiary social risk and performance on quality measures in the Home Health Agency (HHA) setting?***
- ***Is there a relationship between HHA social risk profile and performance on these metrics?***

This chapter presents findings on the relationship between beneficiary or agency social risk and performance under readmission measures relevant to the home health agency (HHA) setting.

Key Findings:

- By raw rates, beneficiaries with social risk factors were much more likely to be re-hospitalized or use ED services during the first 30 days of home health care.
- CMS risk adjustment decreased the effect to some degree, but many social risk factors remained predictive of re-hospitalization and ED use at the beneficiary level. Results were more mixed at the provider level.
- In looking at the relative contribution of beneficiary-level versus provider-level effects, beneficiary dual enrollment and disability status were the dominant factors.

Strategies and Considerations for the Home Health Setting

SUMMARY OF STRATEGIES AND CONSIDERATIONS
STRATEGY 1: Measure and Report Quality for Beneficiaries with Social Risk Factors
CONSIDERATION 1: Consider enhancing data collection and developing statistical techniques to allow measurement and reporting of performance for beneficiaries with social risk factors on key HHA quality and resource use measures.
CONSIDERATION 2: When feasible, consider developing and introducing a new measure or domain on Achieving Health Equity to the HHVBP program to assess and reward facility efforts to reduce health disparities.
CONSIDERATION 3: As HHVBP is implemented, consider prospectively monitoring for potential unintended consequences. Specifically, the potential for reducing access to care for beneficiaries perceived to be at high risk of readmission, such as dually-enrolled beneficiaries, beneficiaries with disabilities or individuals with multiple comorbidities, should be tracked.

STRATEGY 2: Set High, Fair Standards for All Beneficiaries
CONSIDERATION 1: The HHA readmission and ED use measures should continue to be examined to determine if adjustment for social risk factors is appropriate.
CONSIDERATION 2: Program measures should be studied to determine whether differences in health status might underlie the observed relationships between social risk and performance, and whether better adjustment for health status might improve the ability to differentiate true differences in performance between agencies.
STRATEGY 3: Reward and Support Better Outcomes for Beneficiaries with Social Risk Factors
CONSIDERATION 1: Consider providing additional financial incentives to reward agencies that achieve high quality or significant improvement for beneficiaries with social risk factors.
CONSIDERATION 2: Consider using existing or new quality improvement programs to provide targeted technical assistance to providers that disproportionately serve beneficiaries with social risk factors to help improve quality.
CONSIDERATION 3: Consider exploring the potential under the HHA demonstration program to test care innovations particularly focused on beneficiaries with social risk factors.
CONSIDERATION 4: Consider further research to examine the costs of caring for beneficiaries with social risk factors and to determine whether current payments adequately account for these differences in care needs.

I. Introduction

A. Background

As described in chapter 12, Medicare post-acute care (PAC) services are primarily provided to beneficiaries for rehabilitation or recuperation in the course of treating an illness or injury. Unlike other institutional PAC services (i.e., skilled nursing facilities, inpatient rehabilitation facilities, and long-term care hospitals), Medicare home health services are provided in a beneficiary's home on a visiting basis by a participating home health agency (HHA). Medicare coverage includes part-time or intermittent skilled nursing services, home health aide services, physical therapy, occupational therapy, speech-language pathology services, medical supplies, and durable medical equipment. Eligible beneficiaries must require intermittent skilled nursing care or therapy, meet Medicare's definition of homebound, receive services from a Medicare participating home health agency (HHA), and be under a physician's plan of care.

While many Medicare beneficiaries receive PAC services following a hospital stay, the majority receiving Medicare home health coverage actually do so without a prior hospital stay. According to the Medicare Payment Advisory Commission (MedPAC), between 2001 and 2012 the proportion of episodes of home health not preceded by a hospital stay increased from 53% to 66%.[1]

Like hospitals and other Medicare PAC providers, HHAs are paid under a prospective payment system (PPS) using a 60-day episode of care, as implemented in 2000. The HHA 60-day PPS payment is case-mix adjusted for the beneficiary's clinical characteristics and care needs using items from the Outcome & Assessment Information Set (OASIS). Beneficiaries are grouped into home health resource groups (HHRGs), similar to Diagnosis-Related Groups (DRGs) in the hospital setting. The HHRGs vary based on the timing of the care episode, the beneficiary's clinical and functional status, and therapy utilization. The labor portion of the payment is further adjusted for geographic differences in wages based on whether the beneficiary resides in a core-based statistical area (CBSA) (i.e., urban area) or non-CBSA (i.e., rural area).

In recent years, there has been a significant shift in the HHA setting towards measurement, reporting, and payment based on quality. As part of the CMS HHA Quality Initiative, CMS reports HHA quality metrics on its Home Health Compare website to help consumers choose high quality providers. The Home Health Compare Website includes measures such as improvement in ambulation. Based on a subset of these measures, CMS assigns a Star Rating to each HHA for HHA Compare.

Since 2007, HHAs have been subject to a potential annual payment update adjustment based on successfully reporting quality data to CMS.[xvi] This HHA quality reporting program includes both process and outcome measures. Those HHAs which successfully report quality data to CMS do not receive an adjustment to their annual market basket payment update, whereas HHAs that are deemed

[xvi] Section 1895(b)(3)(B)(v)(I) of the Act.

unsuccessful reporters receive a two percentage point reduction. This approach is similar to the initial hospital quality reporting program.

Currently, there is no mandatory national value-based purchasing (VBP) program for HHAs. In the final calendar year 2016 HHA PPS rule,[xvii] CMS finalized a mandatory HHVBP model in nine states, which includes several domains of measures (Patient and Caregiver-Centered Experience and Outcomes, Clinical Quality of Care, Care Coordination, Population Health, Efficiency and Cost Reduction, and Safety). The first performance year is calendar year 2016, with performance to be assessed annually through calendar year 2020. The first payment adjustment will begin in calendar year 2018 based on calendar year 2016 performance data. The program contains a gradual payment adjustment, initially set at 3% for calendar year 2018 (upward or downward) and increasing to 8% for calendar year 2022.

Given the timing of this project and the lack of a national HHVBP program or experience under the HHVBP mandatory model launched in nine states, this analysis will focus on the relationships between social risk factors and performance on two HHA measures: 1) NQF 2380 Re-Hospitalization During the First 30 Days of Home Health and 2) NQF 2505 Emergency Department (ED) Use without Hospital Readmission During the First 30 Days of Home Health. These measures are largely used together to evaluate quality.

B. Existing Research on Differences in HHA Re-hospitalizations and Emergency Department Use Without Readmission

Since a national HHVBP program is not yet in existence, there is no direct evidence of the impact of such a program on HHAs that serve beneficiaries of high social risk, nor is much research available on the relationship between social risk factors and readmissions or other outcomes in the home health setting. Most available evidence regarding social risk factors in the home health setting concerns issues of access rather than quality, and finds that, in general, Medicare beneficiaries with social risk factors are not more likely to lack access to home health services than those without social risk factors.[2,3] Some research suggests that dually-enrolled beneficiaries are more likely than non-dually-enrolled beneficiaries to receive home health services, and account for a disproportionate share of home health use and spending,[4] but little is known about how their home health care outcomes compare to those of other beneficiaries. Other evidence suggests that rural beneficiaries in home health care are less likely to be readmitted than urban beneficiaries.[5]

C. Limitations

Because the analyses for this Report were taking place concurrently with the development of the HHVBP model, there is no program data to evaluate. Instead, the analyses described in this chapter are focused on existing measures in the home health space; in particular this chapter examines readmissions and ED use without rehospitalization because of the importance of this outcome across care settings.

[xvii] 80 Fed. Reg. 68624.

One other limitation is inherent to the measures chosen; due to the exclusion criteria for the measures, only about 25% of HHA stays in the observation period qualify for the measure denominator. Out of the denominator, 9% of stays have the outcome ED use without re-hospitalization and 13% have the outcome re-hospitalization. These figures highlight the small proportion of stays subject to the performance measure.

D. Framework for the Chapter: Analytic Findings, Policy Simulations, Strategies, and Considerations

The remainder of this chapter is structured as follows. First, it describes underlying relationships between social risk and performance on measures of HHA quality. Next, it examines the performance of agencies serving beneficiaries with social risk factors on these measures. Finally, strategies and considerations are presented, using the strategic framework outlined in Chapter 1: 1) measure and report quality for beneficiaries with social risk factors; 2) set high, fair standards for all beneficiaries; and 3) reward and support better outcomes for beneficiaries with social risk factors. These three strategies build on each other to address social risk in Medicare payment programs.

II. Beneficiary and Provider Characteristics

A. Beneficiary Characteristics

To define social risk factors, the parameters outlined in Chapter 2 were followed, and these analyses examine dually-enrolled, low-income ZCTA, disabled, Black, Hispanic, and rural beneficiaries. One notable difference between this chapter and others, except Chapter 12 on SNF, is that in the post-acute setting, rural status is defined using CBSA or non-CBSA rather than MSA or non-MSA. Additionally, rurality at the facility level is driven based on the address of the beneficiaries to which services are provided rather than the address of the provider, since the beneficiary's residence is by definition the place of service delivery. Results are presented using three fiscal years of data to capture the three-year reporting period used in the HHA 30-day claims-based measures.

As Table 13.1 shows, beneficiaries with social risk factors tend to have more comorbidities as defined by hierarchical condition category (HCC) counts, with the exception of rural HHA beneficiaries.

Table 13.1: HHA Beneficiary Population, Fiscal Year 2012- 2014

		Overall Population	Dually-Enrolled	Low-Income ZCTA	Black	Hispanic	Rural (Non-CBSA)	Beneficiaries with Disabilities
N		2,464,387	570,964	518,090	258,086	135,364	203,890	592,651
% of HHA population		100%	23.2%	21.0%	10.5%	5.5%	8.3%	24.0%
Median age		76	70	74	71	74	75	64
% Female		58.6%	66.4%	59.9%	63.4%	59.0%	57.1%	55.1%
Mean risk score		1.33	1.72	1.42	1.68	1.55	1.17	1.73
% of stays* by HCC Counts	**0**	1.2%	0.6%	1.0%	0.7%	1.2%	1.4%	0.7%
	1	3.0%	1.8%	2.5%	2.1%	3.0%	3.4%	1.9%
	2	5.0%	3.4%	4.5%	3.9%	5.0%	5.5%	3.4%
	3-5	23.3%	19.7%	22.1%	20.6%	23.3%	24.5%	19.2%
	6-9	32.5%	32.4%	32.5%	32.1%	31.4%	31.5%	31.2%
	10+	35.1%	42.0%	37.4%	40.6%	36.0%	33.6%	43.6%

*A stay for purposes of the measure is a sequence of home health 60-day episodes separated by at least 60 days that meet the measure exclusion criteria. HCC=hierarchical condition category. Note: categories are not mutually exclusive.

B. HHA Characteristics

As described in Chapter 2, HHAs that serve populations at high social risk were defined by sorting all HHAs by the share of the social risk variable (i.e., dual, low-income, disabled, etc.) and identifying HHAs that account for the top 20% of the initial population for the 30-day HHA re-hospitalization and ED use without readmission measures. This definition differs from that used in other analyses; when the top 20% of providers (rather than population) was used to identify the group of interest, due to a high number of very low-volume providers in the HHA setting, this identified less than 5% of beneficiaries. Beneficiaries (rather than HHAs) located in non-CBSAs are designated rural; thus the "high-rural" HHAs are those with the highest proportion of rural beneficiaries.

Table 13.2 shows characteristics of the 11,774 HHAs in the sample. On average, HHAs that served a high proportion of high-social-risk beneficiaries tend to be for-profit and urban. Rural HHAs were particularly unlikely to be in high-PAC areas (defined as the availability of four Medicare PAC provider settings (i.e., Medicare SNF, HHA, LTCH and IRF) in a given CBSA or non-CBSA), and high-Hispanic HHAs had the highest proportion of 4+ star ratings at 21.0%, while high-disabled and high-Black agencies had the lowest at 15%.

Table 13.2: HHA Characteristics, FYs 2012-2014

Provider Characteristics		All Providers	High Dually-enrolled	Low-income ZCTA	High Black	High Hispanic	High Rural (Non-CBSA)	High Disabled
# of providers		11,774	5,113	4,085	3,637	3,956	2,264	4,248
# of stays*		2,464,387	311,183	402,294	445,784	382,010	534,332	420,634
# of beneficiaries		2,209,696	282,914	370,633	407,917	345,572	490,691	387,573
For-profit		74.1%	86.6%	80.0%	86.3%	87.1%	54.2%	82.3%
CBSA (urban)		87.6%	90.7%	84.9%	92.4%	93.3%	56.7%	88.2%
High PAC**		47.6%	67.2%	53.6%	63.2%	72.7%	10.8%	54.2%
Star ratings	*1-1.5*	1.6%	2.6%	2.4%	2.2%	2.2%	1.7%	2.6%
	2-2.5	20.1%	22.7%	23.4%	23.3%	21.1%	23.3%	24.6%
	3-3.5	35.9%	25.2%	27.3%	28.0%	27.8%	43.7%	27.5%
	4-5	20.6%	18.1%	16.8%	15.1%	20.9%	17.5%	15.0%
	NA†	21.9%	31.6%	30.0%	31.5%	27.9%	13.8%	30.2%

*A stay for purposes of the measure is a sequence of home health 60-day episodes separated by at least 60 days and meets the exclusion criteria.
**A High PAC area is defined as the availability of four Medicare PAC provider settings (i.e., Medicare SNF, HHA, LTCH and IRF) in a county. †A missing HHA star-rating can be due to: 1) the agency not being open long enough, 2) the agency being too small to receive a rating. Note: Provider categories are not mutually exclusive

III. Beneficiary Social Risk Factors, Re-Hospitalization, and ED Use Rates

Similar to the SNF measure described in Chapter 12, the HHA 30-day re-hospitalization and 30-day ED use without readmission measures are triggered by the start, not the end, of care. As such, the 30-day risk window for measures of re-hospitalization or ED use without readmission starts on the first day of home health care. Both measures apply to beneficiaries who had an acute inpatient hospitalization in the five days prior to the start of their home health care. The home health 30-day re-hospitalization measure excludes planned hospitalizations (i.e. for scheduled chemotherapy), and is risk-adjusted using demographics, disability and ESRD status at the time of Medicare enrollment, activities of daily living scores calculated by combining Outcome and Assessment Information Set (OASIS) items, prior care setting and a variety of co-morbidities. The ED use without unplanned re-hospitalizations measure includes the same risk adjustment items. Please see the Appendix to this chapter for full methodology.

A. Individual Social Risk Factors and Risk of Re-Hospitalization and ED Use

Table 13.3 shows the results of beneficiary-level analyses examining individual social risk factors and hospital readmission rates, using fiscal year 2012-2014 data. Dually-enrolled beneficiaries (the first row in the "in-group" column) had a raw hospital readmission rate of 16% during the first 30 days of home health care, compared to 12.3% for non-dually-enrolled beneficiaries (the "not-in-group" column). Overall, dually-enrolled beneficiaries had 44% higher odds of hospital readmission than non-dually-

enrolled beneficiaries. Findings were similar for the other social risk factors, with the exception of the rural group, which demonstrated no significant relationship with readmission.

Table 13.3: Beneficiary-Level Social Risk Factors and Re-Hospitalization Rates, FYs 2012-2014

Social Risk Factor	In-Group Rates	Not-in-Group Rates	Odds Ratio*
Dually-Enrolled	16.0%	12.3%	**1.44**
Low Income ZCTA	14.3%	12.8%	**1.16**
Black	15.6%	12.8%	**1.31**
Hispanic	14.2%	13.0%	**1.12**
Rural	12.9%	13.1%	1.00
Disability	15.5%	12.4%	**1.37**
Bolded odds are significant at p<0.05. Odds ratios were calculated from a generalized estimating equations model with independent correlation matrix, which gives the total (both within-HHA and between-HHA) effect of the social risk factor in each row.			

When these relationships were examined using a random effects model, including a term for HHA social risk makeup, which isolates the within-agency effect of the social risk factor, the odds of hospital readmission dropped from 1.44 to 1.41 for dually-enrolled beneficiaries (Table 13.4). This suggests that within the same HHA, a dually-enrolled beneficiary has 41% higher odds of re-hospitalization than a non-dual. When risk adjustment variables were added to the model, including age, gender, comorbidities, and functional status as outlined above, the effect was significantly attenuated: dually-enrolled beneficiaries were just 9% more likely to be re-hospitalized than non-dually-enrolled beneficiaries. For the other social risk factors, the effects similarly became smaller after adding risk adjustment variables, though they remained significant for the most part. When all six factors were included in a single model, relationships remained minimal for low-income ZCTA, Black, Hispanic, and rural beneficiaries; the odds ratios for dual enrollment and the presence of a disability were unchanged at 1.09 and 1.11, respectively.

Table 13.4: Social Risk Factors and Re-Hospitalization, FYs 2012-2014

Social Risk Factor	Odds Ratio from Random Effects Model	Odds Ratio from Random Effects Model with Risk Adjustment	Odds Ratio from Random Effects Model with Risk Adjustment and all SES Factors Included
Dually-Enrolled	**1.41**	**1.09**	**1.09**
Low Income ZCTA	**1.14**	**1.03**	**1.02**
Black	**1.28**	**1.02**	1.00
Hispanic	**1.13**	1.00	**0.97**
Rural	0.98	1.01	1.00
Disability*	**1.34**	**1.11 (M)** **1.13 (F)**	**1.11**
*Because the CMS risk model includes disability as an interaction term with gender, each gender is presented separately here. Bolded odds ratios are significant at p<0.05. Random effects models include a term for HHA social risk makeup to isolate the within-facility effect of the SES factor in question.			

Table 13.5 shows the results of beneficiary-level analyses examining individual social risk factors and ED use rates without hospital readmission, using fiscal year 2012-2014 data. Dually-enrolled beneficiaries (the first row in the "in-group" column) had a raw ED use rate of 11.7% during the first 30 days of home health care, compared to 8.1% for non-dually-enrolled beneficiaries (the "not-in-group" column). Patients with high social risk factors were more likely to use ED in the first 30 days of a home health stay. Dually-enrolled beneficiaries had 59% higher odds of ED use than non-dually-enrolled beneficiaries, and findings were similar for the other social risk factors:

Table 13.5: Patient Level Social Risk Factors and ED Use Rates, FYs 2012-2014

Social Risk Factor	In-Group Rates	Not in-Group Rates	Odds Ratio*
Dually-enrolled	11.7%	8.1%	**1.59**
Low Income ZCTA	10.1%	8.7%	**1.20**
Black	11.1%	8.7%	**1.36**
Hispanic	9.7%	8.9%	**1.11**
Rural	10.3%	8.9%	**1.19**
Disability	11.6%	8.1%	**1.56**

Bolded odds are significant at $p<0.05$. Odds ratio is calculated from a generalized estimating equations model with independent correlation matrix, which gives the total (both within-HHA and between-HHA) effect of the social risk factor in each row.

Table 13.6 shows the results from modeling these relationships using a random effects model, which isolates the within-facility effect of the social risk factor. Overall, these numbers were relatively unchanged from the prior table, and suggest that within the same HHA, beneficiaries with social risk factors are more likely to use the ED than other beneficiaries. When risk adjustment variables were added to the model, including age, gender, comorbidities, and functional status as outlined above, the effect was reduced: dually-enrolled beneficiaries had 20% higher odds of ED use in the first 30 days of a home health stay than non-dually-enrolled beneficiaries. For the other social risk factors, the effects similarly became smaller after adding risk adjustment variables with the exception of rural. When all six factors were included in a single model, the odds for each were reduced slightly, but remained significant; dual enrollment remained the dominant factor.

Table 13.6: Social Risk Factors and ED Use, FYs 2012-2014

Social Risk Factor	Odds Ratio from Random Effects Model	Odds Ratio from Random Effects Model with Risk Adjustment	Odds Ratio from Random Effects Model with Risk Adjustment and all SES Factors Included
Dually-enrolled	**1.59**	**1.20**	**1.18**
Low Income ZCTA	**1.17**	**1.07**	**1.02**
Black	**1.39**	**1.15**	**1.12**
Hispanic	**1.17**	**1.06**	**1.03**
Rural	**1.09**	**1.09**	**1.09**
Disability	**1.52**	**1.14(M)** **1.18(F)**	**1.13**

*Because the CMS risk model includes disability as an interaction term with gender, each gender is presented separately here. Bolded odds ratios are significant at p<0.05. Random effects models include a term for HHA to isolate the within-facility effect of the SES factor in question.

In summary, these analyses show that social risk factors were associated with significantly higher odds of re-hospitalization and ED use in the first 30 days of a home health stay following an index hospitalization, and that risk adjustment decreased but did not fully explain the effect of social risk factors for both outcomes.

IV. HHA Social Risk Levels, Re-Hospitalization, and ED Use Rates

A. HHA Social Risk Levels, Re-Hospitalization, and ED Use

The next question was whether HHAs that serve a high proportion of beneficiaries with social risk factors have higher unplanned 30-day re-hospitalization rates. Table 13.7 shows the results of the provider level analyses, using data from FYs 2012-2014. Medicare beneficiaries at high-dual HHAs (the first row in the "in-group" column) had a raw re-hospitalization rate of 14.4% during the first 30 days of a home health stay, compared to 12.9% for beneficiaries at non-high-dual HHAs (the "not-in-group" column). This was equivalent to 14% higher odds of readmission for beneficiaries at high-dual HHAs. Findings were mixed for HHAs with a high proportion of beneficiaries with the other social risk factors. When risk adjustment variables were added to the model, including age, gender, comorbidities, and functional status as outlined above, the size of the effect was reduced, with the exception of high-rural. After risk adjustment, beneficiaries served by high-Hispanic HHAs had lower odds of readmission.

Table 13.7: HHAs Serving a High Proportion of Socially At-Risk Beneficiaries, Re-Hospitalizations FYs 2012-2014

HHA Type	In-Group Rates	Not-in-Group Rates	Odds Ratio*	Odds Ratio with Risk Adjustment
High-Dual	14.4%	12.9%	**1.14**	1.00
Low Income ZCTA	13.7%	13.0%	**1.10**	**1.02**
High-Black	14.0%	12.9%	**1.15**	**1.02**
High-Hispanic	13.2%	13.1%	1.00	**0.95**
High-Rural	13.0%	13.2%	0.99	1.01
High-Disabled	14.4%	12.9%	**1.19**	**1.05**
Bolded odds are significant at p<0.05. Odds ratios are calculated from random effects models; in this case since the characteristic in question is an HHA, the odds from a random effects model give the average effect for a beneficiary being at that type of HHA (e.g., high-dual) versus another type of HHA (e.g., non-high-dual).				

In summary, by raw rates, being cared for by an HHA with a high proportion of beneficiaries with social risk factors was associated somewhat higher odds of being readmitted in the first 30 days of HHA care following an index hospitalization, but these effects became smaller after risk adjustment.

Table 13.8 shows the results of the provider level analysis for ED use. Overall, by raw rates, being cared for by an HHA with a high proportion of beneficiaries with social risk factors was associated with higher odds of ED use in the first 30 days of home health care. One exception was beneficiaries served by high-Hispanic HHAs, who were 10% less likely to use ED services than beneficiaries at other HHAs. After risk-adjustment, beneficiaries at high-dual and high-Hispanic agencies were less likely to use ED services, while beneficiaries served by agencies in low-income areas, rural areas, or with high proportions of individuals with disabilities had higher odds of ED use.

Table 13.8: HHAs Serving a High Proportion of Socially At-Risk Beneficiaries, ED Use FYs 2012-2014

HHA Type	In-Group Rates	Not in-Group Rates	Odds Ratio*	Odds Ratio with Risk Adjustment
High-Dual	8.9%	9.0%	**1.03**	**0.95**
Low Income ZCTA	9.9%	8.8%	**1.11**	**1.05**
High-Black	9.3%	8.9%	**1.06**	0.98
High-Hispanic	8.2%	9.1%	**0.90**	**0.90**
High-Rural	10.1%	8.7%	**1.17**	**1.14**
High-Disabled	10.2%	8.7%	**1.19**	**1.06**
Bolded odds are significant at p<0.05. Odds ratios are calculated from random effects models; in this case since the characteristic in question is an HHA, the odds from a random effects model give the average effect for a beneficiary being at that type of HHA (e.g., high-dual) versus another type of HHA (e.g., non-high-dual).				

B. Comparison of Individual Beneficiary Versus HHA Social Risk Factors

To determine whether beneficiary or HHA characteristics were the dominant factor in determining readmission rates, both beneficiary and provider level characteristics were included in the same regression model. The middle column in Table 13.9a shows the odds of re-hospitalization when each factor was examined independently. These values are the same as those found in tables 13.4 and 13.7. The rightmost column of Table 13.9a shows the relative contribution of the beneficiary and provider level factors, determined by adding each social risk indicator to the same random effects model. In general, the effects seemed to be independent in that the estimates did not change much when both beneficiary and provider variables are included in the same model; the most powerful predictors of readmission were beneficiary dual enrollment or the presence of a disability (Table 13.9a).

Table 13.9a: Beneficiary versus Provider Factors in Readmissions

Beneficiary or Provider Level Factor	Models Run Separately for Beneficiary and Provider Factors	Models Run with Beneficiary and Provider Factors in same model
Dually-enrolled – Beneficiary	**1.09**	**1.09**
High-Dual - Provider	1.00	**0.98**
Low-income zip – Beneficiary	**1.03**	**1.03**
Low-income zip - Provider	**1.02**	1.00
Black - Beneficiary	**1.02**	**1.02**
High-Black - Provider	**1.02**	1.01
Hispanic- Beneficiary	1.00	1.02
High-Hispanic - Provider	**0.95**	**0.94**
Rural - Beneficiary	1.01	1.00
Rural - Provider	1.01	1.01
Disabled – Beneficiary (M)	**1.11**	**1.11**
Disabled – Beneficiary (F)	**1.13**	**1.12**
High-Disabled - Provider	**1.05**	**1.05**
Bolded comparisons are significant at $p<0.05$. All models are random effects models with full risk-adjustment variables included.		

Table 13.9b shows findings for ED use, which are similar; again, the effects seemed to be independent in that the estimates did not change much when both beneficiary and provider variables are included in the same model. The most powerful predictors of ED use without readmission were beneficiary dual enrollment, Black race, or the presence of a disability.

Table 13.9b: Beneficiary versus Provider Factors in ED Use

Beneficiary or Provider Level Factor	Models Run Separately for Beneficiary and Provider Factors	Models Run with Beneficiary and Provider Factors in same model
Dually-enrolled – Beneficiary	**1.20**	**1.21**
High-Dual - Provider	**0.95**	**0.91**
Low-income zip – Beneficiary	**1.07**	**1.06**
Low-income zip - Provider	**1.11**	**1.08**
Black - Beneficiary	**1.15**	**1.16**
High-Black - Provider	0.98	**0.95**
Hispanic- Beneficiary	**1.06**	**1.10**
High-Hispanic - Provider	**0.90**	**0.88**
Rural - Beneficiary	**1.09**	**1.04**
Rural - Provider	**1.14**	**1.12**
Disabled – Beneficiary (M)	**1.14**	**1.14**
Disabled – Beneficiary (F)	**1.18**	**1.17**
High-Disabled - Provider	**1.06**	**1.06**
Bolded comparisons are significant at p<0.05. All models are random effects models with full risk-adjustment variables included.		

V. HHA-Level Performance Analyses

The results shown thus far are beneficiary-level analyses examining the relationship between social risk factors and the odds of readmission or ED use without readmission during the first 30 days of home health care. However, the measure is ultimately applied at the HHA level, and though there is no VBP program yet underway for this measure, facility performance can be examined on the two measures to predict what could potentially happen under the program.

Figure 13.1 shows the distribution of HHAs' 30-day risk-adjusted readmission measure performance.[xviii] The fiscal year 2012-2014 national raw average readmission rate was 13.1%.

[xviii] Note that due to measure design, negative readmission rates are mathematically possible though obviously clinically meaningless; these should be interpreted as very good performance.

Figure 13.1: HHA 30-Day Re-Hospitalization Measure Performance, FYs 2012-2014

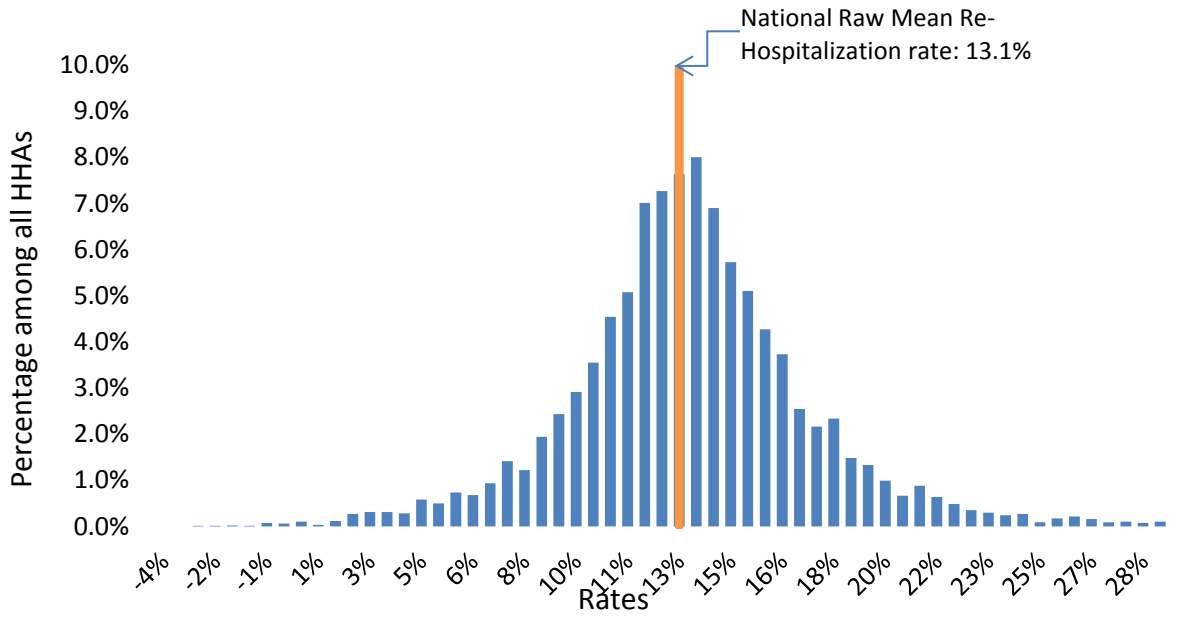
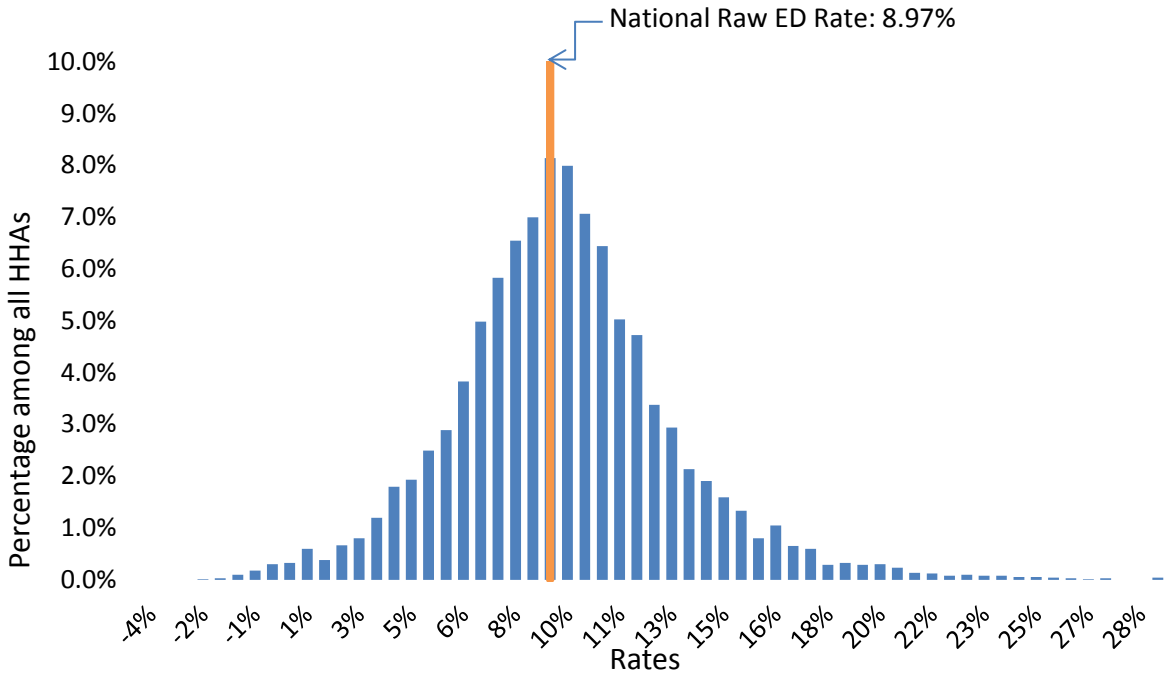


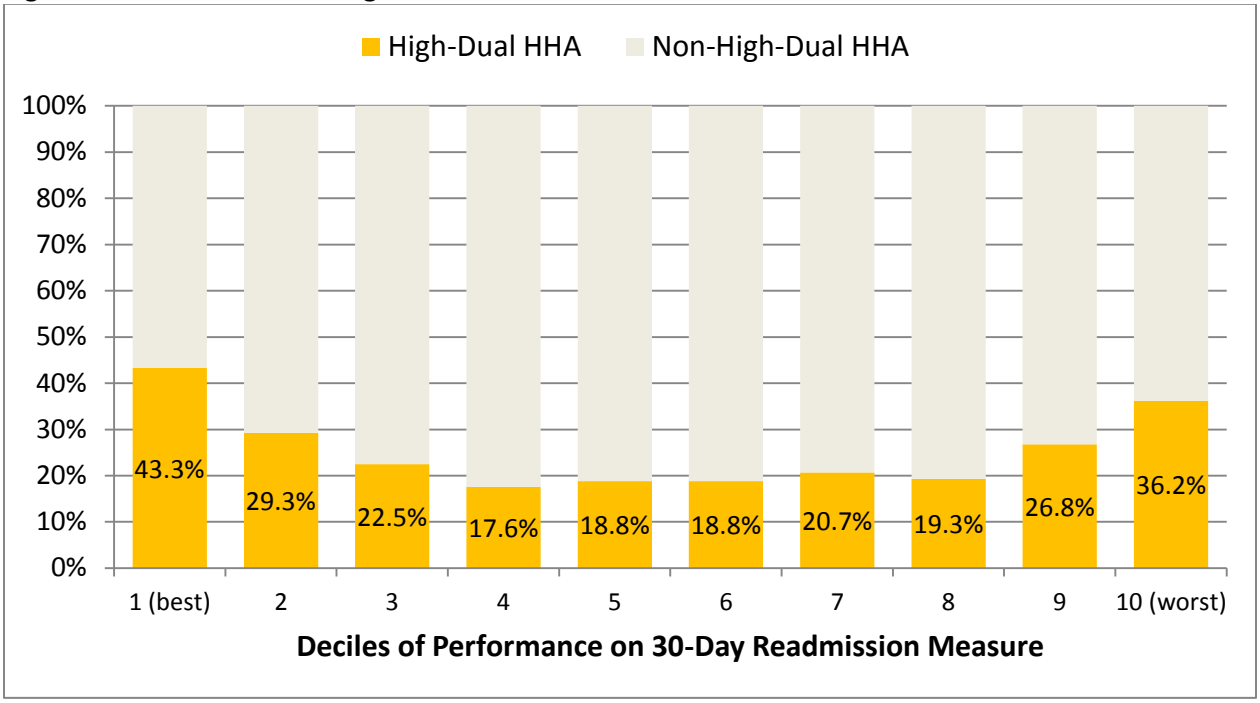
Figure 13.2 shows the distribution of all HHAs' performance on the 30-day risk-adjusted ED use without readmission measure. The FY 2012-2014 national raw ED use without readmission rate was 9.0%.

Figure 13.2: HHA 30-Day ED Use without Re-Hospitalization Measure Performance, FYs 2012-2014



Understanding how particular groups of interest, such as high-dual agencies, perform on these measures may provide insight into how the VBP programs might impact these providers. Performance was therefore divided into deciles for each measure, from low rates of readmission or ED use (best performance) to high rates of readmission or ED use (worst performance), and the proportion of high-dual facilities in each decile was calculated. These analyses (Figure 13.3) show that high-dual HHAs were over-represented in both the best-performing and worst-performing tails of the distribution for rehospitalization:

Figure 13.3: Distribution of High-Dual HHAs Across Deciles of Performance on Readmission Measure



Findings were similar for the ED use measure. These analyses suggest that, though dually-enrolled beneficiaries are much more likely to be rehospitalized and use ED services after a hospitalization, HHAs serving a high proportion of these beneficiaries are often able to achieve good risk-adjusted outcomes despite these levels of elevated risk.

VI. Policy Options

The HHVBP model is new, and therefore there is no program data to examine. Instead, the focus of this chapter is on the relationships between social risk factors and performance on the 30-day HHA readmission and ED use without readmission measure, as discussed above. This chapter does not propose specific policy options, but instead focuses on considerations based on the analyses of the two measures to draw comparisons with the SNF chapter and to help inform discussions around HHVBP.

VII. Key Findings, Strategies, and Considerations

A. Key Findings

Underlying relationships:

- By raw rates, beneficiaries with social risk factors were much more likely to be re-hospitalized or use ED services during the first 30 days of home health care.
- CMS risk adjustment decreased the effect to some degree, but many social risk factors remained predictive of re-hospitalization and ED use at the beneficiary level. Results were more mixed at the provider level.
- In looking at the relative contribution of beneficiary-level versus provider-level effects, beneficiary dual enrollment and the presence of a disability were the dominant factors.

B. Policy Analysis, Strategies, and Considerations

This chapter does not include specific policy options or simulations, but rather focuses on considerations relevant to HHVBP. The considerations are made in light of the policy criteria outlined in Chapter 1, and reiterated in Table 13.10.

Table 13.10: Policy Criteria

Policy Criteria
1. Encourages reduction in disparities in quality and outcomes
2. Protects beneficiaries' access to care by reducing disincentives to caring for high-risk populations
3. Protects providers from unfair financial stress
4. Adjusts only for the difference in performance related directly to the social risk factor, and only for what is beyond provider control
5. Promotes transparency to facilitate consumer choice
6. Supports delivery system reform and Alternative Payment Models

Strategies and considerations are outlined below. They are, as in all program chapters in this report, organized into three broad strategies that best meet the policy criteria outlined in Chapter 1. 1) Measure and report quality for beneficiaries with social risk factors; 2) Set high, fair standards for all beneficiaries; and 3) Reward and support better outcomes for beneficiaries with social risk factors.

STRATEGY 1: Measure and Report Quality for Beneficiaries with Social Risk Factors
Measurement and reporting are foundational for quality improvement in health care.

CONSIDERATION 1: Consider enhancing data collection and developing statistical techniques to allow measurement and reporting of performance for beneficiaries with social risk factors on key HHA quality and resource use measures.
For some HHA measures (though not those examined in this chapter), additional data collection may be

needed to allow measurement and reporting of performance for beneficiaries with social risk factors on key HHA quality and resource use measures. For claims-based measures with large samples, the data are already likely adequate to do so.

Measures stratified into subgroups could allow CMS and clinicians to track and address disparities in readmission rates for beneficiaries at high social risk. Doing so may increase the ability to target quality improvement efforts at groups that may benefit most from such intervention.

CONSIDERATION 2: When feasible, consider developing and introducing a new measure or domain on Achieving Health Equity to the HHVBP program to assess and reward facility efforts to reduce health disparities.

The report on best practices for socially at risk beneficiaries from the National Academies of Sciences, Engineering, and Medicine recognized the prioritization of equity as a key strategy for health care organizations to deliver high-quality care to beneficiaries with social risk factors.[6]

To further highlight the importance of health equity and to focus agencies' attention on reducing disparities, creating a health equity measure or domain could be considered. This would enhance incentives to deliver high-value care to all beneficiaries, including beneficiaries with social risk factors. This approach would be particularly consistent with the policy criterion of encouraging reduction of disparities. A health equity domain could include performance on measures of disparity reduction, performance on outcomes for beneficiaries with social risk factors, or structural measures that address the needs of beneficiaries with social risk factors. However, measures that would comprise such a domain have not been developed, and would need to be constructed, tested, and validated prior to use.

CONSIDERATION 3: As HHVBP is implemented, consider prospectively monitoring for potential unintended consequences. Specifically, the potential for reducing access to care for beneficiaries perceived to be at high risk of readmission, such as dually-enrolled beneficiaries, beneficiaries with disabilities or individuals with multiple comorbidities, should be tracked.

Because in many cases HHAs have the opportunity to screen and either accept or deny beneficiaries based on clinical or financial characteristics, value-based purchasing programs could feasibly reduce access to HHA care for populations perceived to be at high risk of readmission, ED use, or other poor outcomes, particularly when significant financial risk is assumed by agencies. The potential for this unintended consequence should be carefully monitored.

STRATEGY 2: Set High, Fair Standards for All Beneficiaries

Given the overarching goal of improving care for all beneficiaries, providers should be held to high, fair standards regardless of the beneficiaries they serve.

CONSIDERATION 1: The HHA readmission and ED use measures should continue to be examined to determine if adjustment for social risk factors is appropriate.

Similar to the analyses of other settings in this report, beneficiary social risk factors were significant predictors of readmission and ED use in the post-acute setting. Interestingly, the HHA measures, like the SNF readmission measure, include many variables not included in other settings, including whether or not an individual had a disability, was able to perform activities of daily living, and his or her prior care setting, in addition to a comorbidity burden variable. However, in contrast to the SNF setting, the HHA analyses demonstrated persistent differences in readmission by social risk.

These findings, and their contrast to the SNF findings, may point out the important differences between post-acute settings in determining outcomes. The home health setting does differ from SNF in that the beneficiary is discharged from hospital to home for care, and the home health care delivery environment is more decentralized than in a facility. Factors encountered by beneficiaries in their daily lives, such as complex medication regimens, diet, physical activity, and community-based care needs (personal care, transportation, environmental modifications) may be more salient in the home health than the SNF setting, potentially associating social factors more powerfully with health outcomes.

Given this important difference in the home health setting compared to SNF, and the desire to harmonize measures across settings, further study should be undertaken to understand how social factors influence outcomes, focusing on support at home and other topics germane to the home health experience.

CONSIDERATION 2: Program measures should be studied to determine whether differences in health status might underlie the observed relationships between social risk and performance, and whether better adjustment for health status might improve the ability to differentiate true differences in performance between providers.

As the HHVBP program is developed, program measures should be studied to determine whether risk adjustment can be enhanced where feasible. Particularly given the findings outlined in Consideration 1, new measures should be studied to understand the relationships between complexity, frailty, disability, and functional status and readmissions or ED use.

STRATEGY 3: Reward and Support Better Outcomes for Beneficiaries with Social Risk Factors

One of the important findings in this chapter was the wide distribution of performance among providers disproportionately serving beneficiaries with social risk factors. This suggests that achieving better

outcomes for these groups is feasible. However, in many cases it may require more effort on the part of providers, or more resources and more support, than achieving the same outcomes in a lower-risk population.

CONSIDERATION 1: Consider providing additional financial incentives to reward agencies that achieve high quality or significant improvement for beneficiaries with social risk factors.

One way to prioritize improving outcomes in beneficiaries with social risk factors is to provide targeted payment adjustments. Providing such incentives for achieving good outcomes in high-risk populations, be they medically or socially high-risk, could both reduce the disincentive to caring for high-risk groups and recognize that it might be more challenging to achieve low rates of readmission in high-risk populations. This consideration would provide additional reward and/or recognition to HHAs that are able to achieve a quality standard for socially or medically at-risk populations.

Parameters of such an award would need to be determined; one possible model is the bonus in the current Physician Value-based payment modifier program, which awards high-performing practices an additional bonus if they have a particularly medically complex patient population; this could be extended to a socially complex population. Alternatively, a payment adjustment could be given to agencies that achieve particularly good outcomes or improve quality specifically for socially at-risk beneficiaries, regardless of the overall patient population served.

The advantage of this approach is that it provides HHAs an additional incentive to focus on achieving good outcomes in at-risk beneficiaries, which may help reduce disparities in care and outcomes more broadly. One disadvantage is that such a bonus may only reward those high performing HHAs and not "lift all boats" or help lower performing HHAs who are serving a higher proportion of high-risk beneficiaries. Policymakers would need to decide whether the option would be implemented in a budget neutral fashion. A bonus payment could be provided as an additional payment in a non-budget neutral manner or funded via withholds from lower performing providers within the program under a budget-neutral approach.

CONSIDERATION 2: Consider using existing or new quality improvement programs to provide targeted technical assistance to facilities that disproportionately serve beneficiaries with social risk factors to help improve quality.

The findings presented here suggest that particular attention may need to be paid to dually-enrolled beneficiaries or beneficiaries with disabilities, who have higher raw and risk-adjusted rates of readmission and ED use. Quality improvement efforts focused on reducing readmission rates should be targeted at these individuals, and best practices shared and disseminated, where feasible. Experience from MA contracts' experience of providing services to dually-enrolled beneficiaries, or demonstration programs from CMMI focused on understanding broader care innovations, could also help Medicare learn more about what types of care might achieve the best outcomes for beneficiaries with social risk factors receiving home health services.

CONSIDERATION 3: Consider exploring the potential under the HHA demonstration program to test care innovations particularly focused on beneficiaries with social risk factors.
The HHA demonstration may provide a particularly rich opportunity to determine which types of care innovations in the home health setting may particularly help beneficiaries with social risk factors achieve good outcomes.

CONSIDERATION 4: Consider further research to examine the costs of caring for beneficiaries with social risk factors and to determine whether current payments adequately account for these differences in care needs.
Payment policies should be examined. The HHA setting pays in a bundled fashion based in part on medical risk, but does not provide additional payments for providers based on the social risk profile of its beneficiaries, though this is done in some other care settings – most notably the DSH payments awarded to hospitals based on the social risk profile of hospitalized individuals. It is currently unknown whether or not payments based on medical risk adequately account for any differences in the costs of providing post-acute care to socially-at risk individuals. Additional analyses should examine this issue.

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CHAPTER 14: Summary of Findings, Strategies, and Considerations; Conclusions; and Next Steps

I. Summary of Findings

This report started by describing the debate around accounting for social risk in Medicare value-based purchasing programs. If beneficiaries with social risk factors have worse health outcomes because of factors beyond providers' control, value-based purchasing could inappropriately penalize providers that care for them. It could also result in providers becoming reluctant to care for beneficiaries with social risk factors, out of fear of incurring penalties. On the other hand, if beneficiaries with social risk factors have worse health outcomes because the providers they see provide low-quality care, value-based purchasing could be a powerful tool to drive improvements in care and reduce health disparities.

How to square the debate in the reality of the current Medicare program, where beneficiaries vary widely in their medical and social complexity, and where providers face many new programs across multiple care settings as they shift to new payment paradigms, was less simple. However, as each program was explored, it became evident that the data had revealed powerful common findings across measures and settings, which is what ultimately led to considerations that were more similar than different across programs, despite each program's singularities. These findings follow.

A. FINDING 1: Beneficiaries with social risk factors had worse outcomes on many quality measures, regardless of the providers they saw, and dual enrollment status was the most powerful predictor of poor outcomes.

Beneficiaries with social risk factors had poorer outcomes on many quality measures, including process measures (e.g., cancer screening), clinical outcome measures (e.g., diabetes control, readmissions), safety (e.g., infection rates), and patient experience measures (e.g., communication from doctors and nurses), as well as higher resource use (e.g., higher spending per hospital admission episode). This was true even when comparing beneficiaries at the same hospital, health plan, ACO, physician group, or facility. Dual enrollment (enrollment in both Medicare and Medicaid) was typically the most powerful predictor of poor performance among those social risk factors examined. For the most part, these findings persisted after risk adjustment, across care settings, measure types, and programs, and were moderate in size. Three exceptions were noted: risk-adjusted mortality rates (from HVBP), risk-adjusted admissions for heart failure (from Medicare Shared Savings Program), and risk-adjusted inpatient readmissions of Medicare SNF beneficiaries to IPPS hospitals and critical access hospitals (from SNF VBP). These findings are summarized in Table 14.1:

Table 14.1: Relationship Between Dual Enrollment Status and Performance Across Programs

Program	Finding for Dually-enrolled beneficiaries vs. Non-Dually-enrolled beneficiaries
Hospital Readmissions Reduction Program	• 10-31% higher risk-adjusted odds of readmission
Hospital-Acquired Conditions Reduction Program	• Higher safety event rates for 4/8 individual events; **lower for 2/8**
Hospital Value-Based Purchasing Program	• 5-14% lower risk-adjusted odds of mortality • 4% higher risk-adjusted spending per episode
Medicare Advantage	• Performance worse on 17/19 beneficiary-level quality measures examined
Medicare Shared Savings Program	• 18% higher risk-adjusted odds of readmission • 16% higher age/gender-adjusted odds of COPD admission • 14% lower age/gender-adjusted odds of HF admission
Physician Value-Based Payment Modifier	• 11-20% higher risk-adjusted odds of readmission • 80-230% higher risk-adjusted odds of preventable admission • $725-$2,979 higher risk-adjusted costs
ESRD Quality Incentive Program	• Performance worse on 5/5 quality measures
Skilled Nursing Facility Readmissions	• 4% lower risk-adjusted odds of readmission
Home Health Readmissions and ED Use	• 9% higher risk-adjusted readmission rates • 18% higher risk-adjusted ED use rates
Bold font indicates where dually-enrolled beneficiaries have better outcomes.	

B. FINDING 2: Providers that disproportionately served beneficiaries with social risk factors tended to have worse performance on quality measures, even after accounting for their beneficiary mix, and this was associated with penalties under all five current value-based purchasing programs in which penalties are currently assessed.

In every care setting, providers that disproportionately cared for beneficiaries with social risk factors tended to perform worse than their peers on quality measures. Some of these differences were driven by beneficiary mix, but some of the difference persisted even after adjusting for beneficiary characteristics. As a result, safety-net providers were more likely to face financial penalties across all but one of the Medicare value-based purchasing programs, including programs in the hospital, health plan, physician group, and facility settings. The single exception was that ACOs with a high proportion of dually-enrolled beneficiaries were more likely to share in savings under the Medicare Shared Savings Program.

However, in every setting, be it hospital, health plan, ACO, physician group, or facility, there were some providers that served a high proportion of beneficiaries with social risk factors who achieved high levels of performance.

These findings are summarized below. First, performance for providers that disproportionately served dually-enrolled beneficiaries is shown with and without accounting for the social risk profile of providers' beneficiary mix in Table 14.2. Providers disproportionately serving dually-enrolled beneficiaries generally had worse outcomes than other providers, but the magnitude of this association dropped significantly after accounting for providers' beneficiary mix, particularly for readmissions and ambulatory care-sensitive admissions:

Table 14.2: Relationship Between Disproportionately Serving Dually-Enrolled Beneficiaries and Provider Performance Across Programs

Program	Performance for providers serving dually-enrolled beneficiaries,* under current program specifications	Performance for providers serving dually-enrolled beneficiaries, after accounting for beneficiary mix
Hospital Readmissions Reduction Program	• 9-14% higher odds of readmission	• 5-9% higher odds of readmission
Hospital-Acquired Conditions Reduction Program	• 9-36% higher clinically risk-adjusted odds of an event across 6 of 8 patient safety event measures	• 18-35% higher risk across 4 events, 2 no longer significant
Hospital Value-Based Purchasing Program	• 1% more expensive on Medicare Spending per Beneficiary measure	• Same level of Medicare Spending per Beneficiary
Medicare Advantage	• Worse performance on 7/19 beneficiary-level measures examined, better on 1	• Worse performance on 2/19 patient-level measures, better on 3
Medicare Shared Savings Program	• Similar odds of readmission • 19% higher odds of COPD admission • Similar odds of HF admission	• Similar odds of readmission • 14% higher odds of COPD admission • Similar odds of HF admission
Physician Value-Based Payment Modifier	• 24-29% higher odds of readmission • 14-45% higher odds of acute ambulatory care sensitive admissions • Similar to $1,700 higher per-capita costs	• 18-24% higher odds of readmission • Similar odds of acute ambulatory-care-sensitive admissions • Similar to $1,390 higher per-capita costs
End-Stage Renal Disease Quality Incentive Program	• Worse performance on 1/5 measures and better performance on 1/5 measures	• Worse performance on 1/5 measures and better performance on 1/5 measures
Skilled Nursing Facility Readmissions	• 10% higher odds of readmission	• 12% higher odds of readmission
Home Health Readmissions/ED Use	• Similar odds of readmission • 5% lower odds of ED use	• 2% lower odds of readmission and ED use

Bold font indicates where providers serving dually-enrolled beneficiaries have better outcomes.
*For hospitals, this group is defined as the top 20% of Disproportionate Share Hospital Index. For all other providers, this group is defined as the top 20% of the share of dually-enrolled beneficiaries.

Financial performance under Medicare's value-based purchasing programs for providers that disproportionately served dually-enrolled beneficiaries on is shown in Table 14.3. These providers were more likely to face financial penalties on all but one of the Medicare value-based purchasing programs. In some cases, the same hospitals were receiving large penalties under all three hospital quality programs. One exception was noted: high-dual ACOs were more likely to share in savings under the Medicare Shared Savings Program:

Table 14.3: Relationship Between Providers and Plans Disproportionately Serving Dually-Enrolled Beneficiaries and Penalties Across Programs

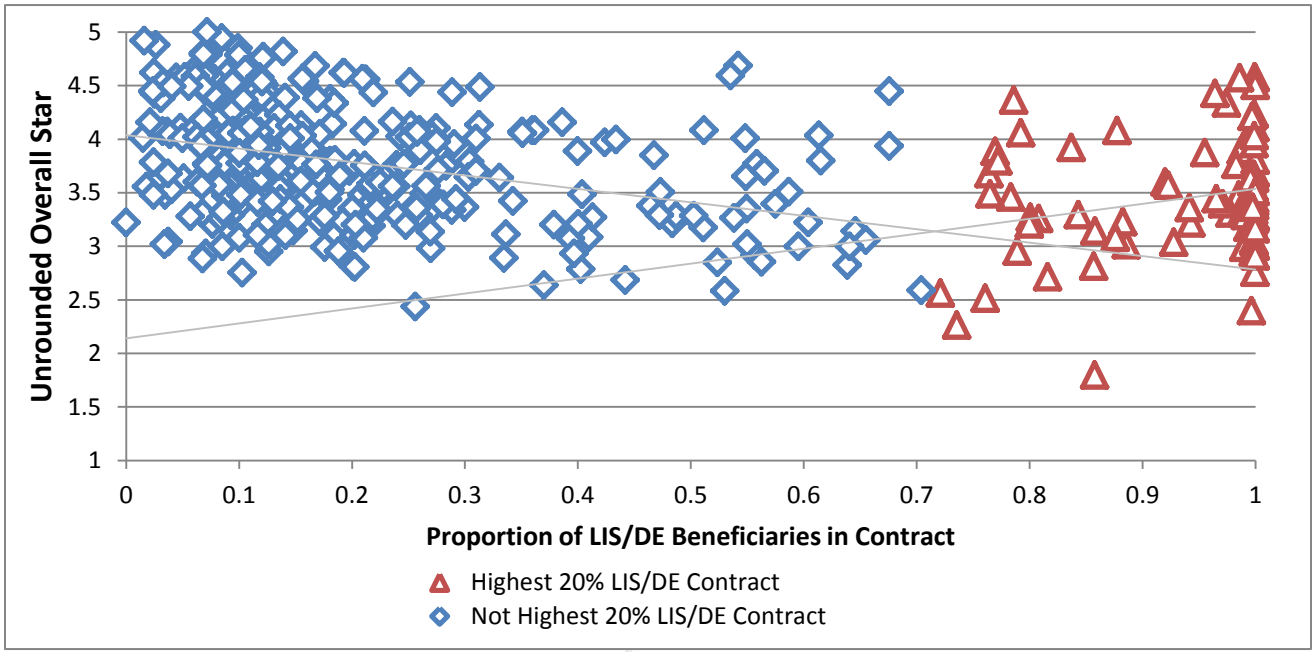
Program	Performance for providers serving dually-enrolled beneficiaries* vs. other providers, under current program specifications
Hospital Readmissions Reduction Program	7 points more likely to be penalized (87% vs. 80%), 0.02% higher penalties (as % of base DRG payments)
Hospital-Acquired Conditions Reduction Program	10 points more likely to be penalized (30% vs. 21%)
Hospital Value-Based Purchasing Program	17 points more likely to be penalized (58% vs. 41%), 0.2% higher penalties on average (as % of base DRG payments)
Medicare Advantage	Half as likely to achieve bonuses for 4-Star Rating (26% vs. 53% of other contracts)
Medicare Shared Savings Program	5 points more likely to share in savings (30% vs. 25%)
Physician Value-Based Payment Modifier	17% more likely to receive downward adjustment (25% vs. 8%), less likely to successfully participate
End-Stage Renal Disease Quality Incentive Program	Slightly more likely to be penalized (7% vs. 6%)
Skilled Nursing Facility Readmissions	No payment program yet operational; high-dual SNFs more likely to be in worst decile of performance
Home Health Readmissions and ED Use	No payment program yet operational; high-dual HHAs more likely to be in worst decile of performance (but also in best decile of performance)

Bold font indicates where providers serving dually-enrolled beneficiaries have better outcomes.
*For hospitals, this group is defined as the top 20% of Disproportionate Share Hospital Index. For all other providers, this group is defined as the top 20% of the share of dually-enrolled beneficiaries.

Despite these patterns, in every setting, there were examples of physician groups, hospitals, contracts, or facilities that served a high proportion of beneficiaries with social risk factors who achieved high levels of performance. Two examples follow. First, in Medicare Advantage, performance on the quality Star Rating was lower at higher levels of dual enrollment until roughly 60-70% dual enrollment; beyond this point, the relationship between dual and performance was actually positive. These findings suggest

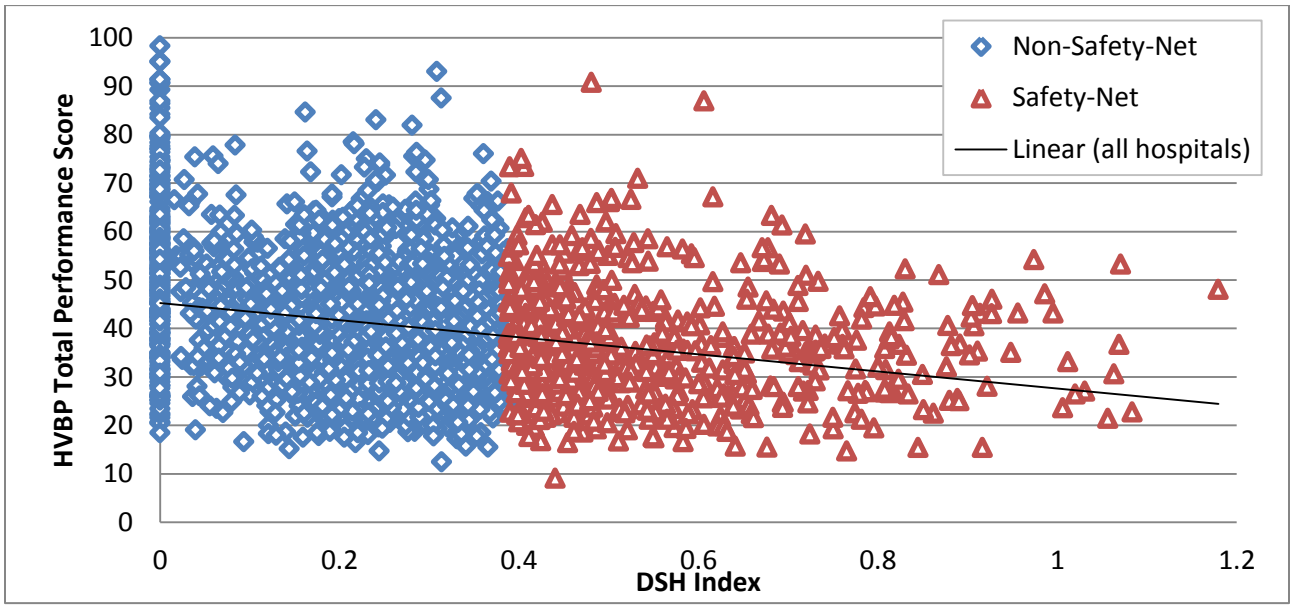
that some contracts with very high proportions of dually-enrolled beneficiaries have successfully implemented strategies and supports to achieve good outcomes in this population (Figure 14.1):

Figure 14.1: Relationship between Proportion Dually-Enrolled/Low-Income-Subsidy Status and Medicare Advantage Quality Star Rating



On the other hand, under the Hospital Value-Based Purchasing Program, essentially no hospitals with a DSH Index greater than 0.7 achieved a performance score greater than 60; there was no uptick in performance at higher levels of DSH Index (Figure 14.2):

Figure 14.2: Relationship Between DSH Index and HVBP Total Performance Score



C. Interpretation of Findings

The first question motivating this research was "Do beneficiaries with social risk factors have worse outcomes due to their social risk profile, or because of the providers they see?" The answer is *both* – dual enrollment status is independently associated with worse outcomes, and dually enrolled beneficiaries are more likely to see lower-quality providers. The second question was "Do providers that serve beneficiaries with social risk factors perform worse due to the high proportion of beneficiaries with social risk factors, or do they provide worse care overall?" The answer, again, is *both*. Providers serving high proportions of beneficiaries with social risk factors tended to perform worse in part due to the patient population, and in part due to poor performance overall. Therefore, proposed solutions that address solely the social risk factors or solely provider performance are unlikely to mitigate the full implications of the relationship between social risk factors and performance.

Further complicating the issue, these analyses cannot determine why such patterns exist. Beneficiaries with social risk factors may have poorer outcomes due to a host of factors, including higher levels of medical risk, worse living environments, greater challenges in adherence and lifestyle, and/or bias or discrimination. Providers serving these beneficiaries may have poorer performance due to a similarly long list of factors, including fewer resources, more challenging clinical workloads, lower levels of community support, or worse quality. Many of these factors, for both beneficiaries and providers, are not easily measured with current data. Yet, understanding the "whys" is essential to finding lasting and meaningful solutions. There is clearly more work to be done.

II. Strategies and Considerations

The Department's goal is to develop value-based payment programs under which *all* Medicare beneficiaries receive the highest quality healthcare services. In the context of the findings above, however, it is clear that doing so will require a multipronged approach, as proposed solutions that address only the measures without considering the broader delivery system and policy context are unlikely to mitigate the full implications of the relationship between social risk factors and outcomes. Ideally, value-based purchasing programs can be leveraged to enhance, rather than threaten, access to and provision of high-quality care for beneficiaries with social risk factors.

Therefore, the Department proposes for consideration a three-part strategy (Figure 1):

Figure 1. Strategy for Accounting for Social Risk in Medicare's Value-Based Purchasing Programs

First, performance on quality and outcomes should be **measured and reported specifically for beneficiaries with social risk factors**. Doing so would allow policymakers and clinical leaders to identify, track, and address disparities in care.

Second, **high, fair quality standards** should be set for all beneficiaries. Whether the most "fair" standard is one that does or does not adjust for social risk will depend on the type of measure and how the considerations outlined earlier apply to that particular measure. Additionally, all measures should be studied to determine whether accounting for frailty, medical complexity, functional status, or other factors might improve their ability to fairly and accurately assess provider performance.

Meeting quality standards, particularly for outcome measures, may be harder for beneficiaries with social risk factors, who face specific challenges to achieving good health outcomes. Therefore, value-based purchasing programs should:

a) provide **specific payment adjustments to reward achievement and/or improvement for beneficiaries with social risk factors,** and

b) where feasible, **provide targeted support** for providers who disproportionately serve them.

First, leveraging the power of value-based purchasing to provide specific payment adjustments to reward providers for successfully achieving high quality and/or good health outcomes in beneficiaries with social risk factors may provide important incentives to focus on these individuals, and help offset any real or perceived disincentives to caring for them.

Second, providing targeted support, for example through quality improvement programs designed specifically for beneficiaries with social risk factors, is also critical to ensuring that all beneficiaries can have the best health outcomes possible. Another key component of support is ensuring that current base payments are adequate to support high-quality care for beneficiaries with social risk factors.

Considerations for how these strategies might be applied to Medicare payment programs are provided below. Note that these are general considerations, and not all apply to each program reviewed.

A. STRATEGY 1: Measure and Report Quality for Beneficiaries with Social Risk Factors

Consideration 1: Consider enhancing data collection and developing statistical techniques to allow measurement and reporting of performance for beneficiaries with social risk factors on key quality and resource use measures.
The ability to measure and track quality, outcomes, and costs for beneficiaries with social risk factors over time is crucial as policymakers and providers seek to reduce disparities and improve care for these groups. However, there are two things that would need to be addressed for this to be feasible: first, data would need to be collected on enough beneficiaries for performance assessment by subgroup; and second, statistical techniques to allow calculation for subgroups would need to be developed.

Consideration 2: Consider developing and introducing health equity measures or domains into existing payment programs to measure disparities and incent a focus on reducing them.
Quality measures help providers prioritize areas for particular focus, and specific measures targeting equity within existing value-based purchasing programs can therefore incent a focus on reducing disparities. This could be achieved by adding a health equity measure or domain to existing programs.

Consideration 3: Prospectively monitor the financial impact of Medicare payment programs on providers disproportionately serving beneficiaries with social risk factors.
Many of the programs examined in this report are new or in evolution. Prospectively monitoring the financial impact of Medicare payment programs on providers disproportionately serving beneficiaries with social risk factors is critical as the programs continue to change. One example of such prospective study is the section in this report examining the hospital-wide readmission measure, which has been proposed for implementation in the HRRP. Analyses here demonstrate that moving to such a measure, in the absence of other chances to the program, could disproportionately impact the safety net. Similarly, analyses in this report examining future changes to the HACRP demonstrate that these may negatively impact safety-net hospitals. These types of analyses are important for policymakers to consider as Medicare's value-based purchasing programs continue to evolve.

B. **STRATEGY 2: Set High, Fair Quality Standards for All Beneficiaries**

Consideration 1: Measures should be examined to determine if adjustment for social risk factors is appropriate; this determination will depend on the measure and its empirical relationship to social risk factors.
There is not an all-encompassing approach to whether or not measures should be adjusted for social risk. These decisions should consider the benefits and concerns of adjustment discussed above. Additionally, empirical evidence on the relationship between the social risk factor and the outcome, including whether there is evidence that need or complexity is driving differences in performance, or if the differences in performance are related to true differences in the quality of care delivered to beneficiaries with social risk factors, should be considered. Such decisions should be continuously evaluated as new data on social risk and better data on medical risk become available and as new measures are introduced into the programs.

Consideration 2: The measure development community should continue to study program measures to determine whether differences in health status might underlie the observed relationships between social risk and performance, and whether better adjustment for health status might improve the ability to differentiate true differences in performance between providers.
Some of the observed relationship between social risk factors and performance on quality measures may be the result of underlying differences in medical complexity, frailty, disability, and/or functional status. For example, dually-enrolled beneficiaries are more likely to have poor functional status, and therefore may be more likely to be readmitted after a hospitalization. However, data on these factors are not broadly available and will require further development. In order for value-based purchasing programs to be as accurate as possible, and to avoid unfairly penalizing providers that serve socially or medically complex beneficiaries, both quality and resource use measures should be continuously improved to account for differences in these and other components of medical risk.

C. STRATEGY 3: Reward and Support Better Outcomes for Beneficiaries with Social Risk Factors

Consideration 1: Consider creating targeted financial incentives within value-based purchasing programs to reward achievement of high quality and good outcomes, or significant improvement, among beneficiaries with social risk factors.
Achievement and/or improvement for beneficiaries with social risk factors should be rewarded, and this could be done via payment adjustments within existing value-based purchasing programs to reward providers that do so. Leveraging the power of value-based purchasing to provide specific payment adjustments to reward providers for successfully achieving high quality and/or good health outcomes in beneficiaries with social risk factors may provide important incentives for doing so, and help offset any real or perceived disincentives under value-based purchasing programs to caring for these beneficiaries. Such opportunities would also highlight the need to focus on these groups to improve outcomes.

Consideration 2: Consider using existing or new quality improvement programs to provide targeted support and technical assistance to providers that serve beneficiaries with social risk factors.
Improving care delivery by providers serving at-risk populations would serve both to reduce disproportionate penalty burdens on these providers, and more importantly, to improve care for the most socially at-risk Medicare beneficiaries.

Consideration 3: Consider developing demonstrations or models focusing on care innovations that may help achieve better outcomes for beneficiaries with social risk factors.
One promising strategy for identifying and testing innovative strategies that may meet the unique needs of beneficiaries with social risk factors is via demonstrations or models. Examples include the demonstration programs in Medicare Advantage that focus on coordinating benefits between Medicare and Medicaid, and CMMI's Accountable Health Communities model.

Consideration 4: Consider further research to examine the costs of achieving good outcomes for beneficiaries with social risk factors and to determine whether current payments adequately account for any differences in care needs.
It might require more resources to achieve good outcomes for beneficiaries with social risk factors, but how much and what type of resources is poorly understood. Future research should determine whether current payments, typically based only on differences in medical risk, adequately account for these differences in care needs. Note that this is a different consideration than additional value-based purchasing adjustments as outlined in Consideration 1 above – this consideration instead refers specifically to whether providers should be paid more to care for beneficiaries with social risk factors via higher base payments, regardless of performance. Disproportionate Share Hospital payments in the hospital setting are one current example of such add-on payments for social risk, and payments to MA contracts to provide care for beneficiaries are also higher for beneficiaries with social risk factors. However, currently, no such provision exists for physicians in the outpatient setting, skilled nursing facilities, dialysis facilities, and other care types. This should be studied.

Table 14.4 demonstrates how these considerations were applied to programs analyzed in this report:

Table 14.4: Application of Considerations to Programs in this report

Strategies	Considerations	HRRP	HACRP	HVBP	MA Quality Star Program	Medicare Shared Savings Program	Physician VM	ESRD QIP	SNF VBP	HHVBP
Strategy 1: Measure and Report Quality for Beneficiaries with Social Risk Factors	• **Pursue reporting for beneficiaries with social risk factors**	√	√	√	√	√	√	√	√	√
	• **Develop health equity measures**	n/a[1]	n/a[1]	√	√	√	√	√	√	√
	• **Prospectively monitor program impact on providers disproportionately serving beneficiaries with social risk factors**	√	√	√	√	√	√	√	√	√
Strategy 2: Set High, Fair Quality Standards for All Beneficiaries	• **Consider measures for adjustment on a case-by-case basis**	√	√	√	√	√	√	√	√	√
	• **Improve risk adjustment for health status in program measures**	√	√	√	√	√	√	√	√	√
Strategy 3: Reward and Support Better Outcomes for Beneficiaries with Social Risk Factors	• **Provide payment adjustments to reward achievement and/or improvement in beneficiaries with social risk factors**	√	√	√	√	√	√	√	√	√
	• **Use existing or new QI to support providers that serve beneficiaries with social risk factors**	√	√	√	√	√	√	√	√	√
	• **Encourage demos / models focusing on beneficiaries with social risk factors[2]**	√	√	√	√	√	√	√	√	√
	• **Conduct research on the costs of caring for beneficiaries with social risk factors**	√	√	√	√	√	√	√	√	√

n/a=not applicable.
1= Program has a statutorily set list or type of measures; thus this consideration is not applicable
2=Many of these programs do not have demonstration/model authority; the concept would be to design demonstrations or models that addressed key issues salient to beneficiaries with social risk factors, which might influence outcomes under these programs.
HRRP=Hospital Readmissions Reduction Program; HVBP=Hospital Value-Based Purchasing Program; HACRP=Hospital-Acquired Conditions Reduction Program; MA=Medicare Advantage; Medicare Shared Savings Program=Medicare Shared Savings Program; VM=Value-based payment modifier; ESRD QIP=End-Stage Renal Disease Quality Incentive Program; SNF VBP=Skilled Nursing Facility Value-Based Purchasing; HHVBP=Home Health Value-Based Purchasing

III. Conclusions

Social factors are powerful determinants of health. In Medicare, beneficiaries with social risk factors have worse outcomes on many quality measures, including measures of processes of care, intermediate outcomes, outcomes, safety, and patient/consumer experience, as well as higher costs and resource use. Beneficiaries with social risk factors may have poorer outcomes due to higher levels of medical risk, worse living environments, greater challenges in adherence and lifestyle, and/or bias or discrimination. Providers serving these beneficiaries may have poorer performance due to fewer resources, more challenging clinical workloads, lower levels of community support, or worse quality.

The scope, reach, and financial risk associated with value-based and alternative payment models continue to widen. There are three key strategies that should be considered as Medicare aims to administer fair, balanced programs that promote quality and value, provide incentives to reduce disparities, and avoid inappropriately penalizing providers that serve beneficiaries with social risk factors. **Measuring and reporting quality for beneficiaries with social risk factors**, setting **high, fair quality standards for all beneficiaries,** and the **provision of targeted rewards and supports for better outcomes in beneficiaries with social risk factors**, may help ensure that all Medicare beneficiaries can achieve the best health outcomes possible.

IV. Next Steps

The findings outlined in this report represent only the beginning of a body of necessary work around fair and accurate quality measurement in the context of Medicare's increasing use of value-based purchasing programs. The IMPACT Act lays out specific additional requirements for Study B, including the examination of specific social risk factors not currently available in Medicare data such as health literacy, limited English proficiency, and Medicare beneficiary activation (the degree to which beneficiaries have the knowledge, skill, and confidence to manage their health and health care). Based on the findings in this report, future work may also include examining the impact of measuring and accounting for functional status or frailty on the relationship between social risk factors and performance, and identifying care innovations associated with the achievement of good health outcomes for beneficiaries with social risk factors.