



# Hospitalization Cost Savings Associated with COVID-19 Vaccinations Among Medicare Beneficiaries in Early 2021

An analysis of Medicare fee-for-service (FFS) claims data indicates that COVID-19 vaccinations led to \$2.6 billion in total savings from reduced hospitalizations among Medicare beneficiaries from January to May 2021.

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## KEY POINTS

- Vaccination for COVID-19 has been linked to reduced infections, hospitalizations, and deaths among Medicare beneficiaries. In addition to the direct health benefits of vaccination, COVID-19 vaccination has also reduced Medicare spending on COVID-19 related hospitalizations and other health care services.
- Using Medicare FFS claims data and county-level vaccination rates, we estimate that total hospitalization savings from COVID-19 vaccinations among Medicare beneficiaries (FFS and Medicare Advantage “MA”) were approximately \$2.6 billion from January to May 2021. Part of these savings are realized directly by the Medicare FFS program, while MA plans realized some of the savings from reduced hospitalizations of beneficiaries enrolled in MA.
- These savings are conservative as they do not include physician services, post-acute care, and other follow-up services. These cost savings reflect 107,000 fewer Medicare COVID-19 hospitalizations during this period, compared to projections if no COVID-19 vaccines were available during that period.
- Medicare beneficiary cost-sharing was reduced by an estimated \$207 million from reduced COVID-19 hospitalizations during this period. Some of these savings were realized by MA plans, Medigap, or other supplemental insurance.
- The total hospitalization cost savings from this early vaccination period were nearly large enough to offset the cost for approximately 67.7 million single doses of J&J or 31.2 million two-dose series of Pfizer-BioNTech or Moderna vaccines. For comparison, approximately 44 million adults 65 and older were fully vaccinated (with either a one or two-shot series) through May 2021.
- Future analyses will examine hospitalizations prevented by vaccination during the Delta and Omicron waves, along with estimated hospitalization cost savings.

## BACKGROUND

Since the start of the COVID-19 pandemic until the end of November 2021, COVID-19 had led to 6 million infections and 1.6 million hospitalizations.<sup>1</sup> In addition to the devastating human toll, COVID-19 hospitalizations increased Medicare program spending. According to the Centers for Medicare and Medicaid Services (CMS), the average cost of a Medicare COVID-19 hospitalization stay without beneficiary out-of-pocket spending for inpatient deductible was approximately \$24,300, nearly double the average cost of a Medicare hospitalization before the pandemic, \$12,900.<sup>2,3</sup> According to CMS, the average length of stay for a Medicare COVID-19 hospitalization was 9 days,<sup>4</sup> whereas prior to the pandemic, the average Medicare hospital length of stay was about 5 days.<sup>5</sup> While 53% of Medicare COVID-19 hospitalizations lasted between 1 and 7 days, 47% of stays were longer than 8 days.<sup>1</sup>

Studies of COVID-19 vaccinations indicate strong protection against severe outcomes including hospitalizations and death.<sup>6</sup> The initial roll-out of COVID-19 vaccinations to Medicare beneficiaries started in December 2020. CDC data shows nearly 80% of seniors 65 and older were fully vaccinated by early May 2021.<sup>7</sup> In an earlier analysis, ASPE estimated that initial vaccinations from January-May 2021 were associated with estimated reductions of 265,000 COVID-19 cases, 107,000 hospitalizations, and 39,000 deaths among all Medicare beneficiaries, based on an analysis of Medicare fee-for-service (FFS) claims data *extrapolated* to the full Medicare population (FFS and Medicare Advantage “MA”).<sup>8</sup>

The purpose of this report is to provide an estimate of total hospitalization savings among Medicare beneficiaries (FFS and MA) from reduced hospitalizations in association with early COVID-19 vaccinations in 2021. To account for the costs of vaccines and administering vaccines to Medicare beneficiaries, this analysis also estimates the hypothetical net reduction in Medicare spending, *if* the Medicare program had financed the cost of vaccinations. We report this as the number of COVID-19 vaccine doses that would be covered by the cost savings from the reduction in Medicare hospitalizations associated with vaccinations. We note that the federal government purchased vaccines for the entire population, so the Medicare program did *not* incur the cost of the vaccine itself, though the program paid vaccine administration fees to providers. In addition, MA plans may realize savings from reduced hospitalizations of vaccinated beneficiaries enrolled in MA plans, and Medigap plans may also realize savings from paying for hospital deductibles and other out-of-pocket costs for beneficiaries with Medigap coverage who avoided a vaccine-prevented hospitalization. This information can be useful for policymakers in understanding the public health value of vaccinations, especially among beneficiaries who are at higher risk of severe COVID-19 outcomes, as well as the financial savings to the Medicare program and beneficiaries of reducing vaccine-preventable COVID-19 hospitalizations.

## METHODS

This analysis used ASPE’s previous estimates of reductions in COVID-19 hospitalizations associated with COVID-19 vaccinations in early 2021<sup>8</sup> and the average cost of a Medicare FFS COVID-19 hospitalization<sup>1</sup> to estimate total hospitalization cost savings among all Medicare beneficiaries. The number of COVID-19 related hospitalizations, with and without vaccines, and reduced hospitalizations due to vaccinations among all Medicare beneficiaries from January 1, 2021, through May 29, 2021, came from ASPE’s previously published report.<sup>8</sup> The average Medicare FFS cost per COVID-19 hospitalization reported by CMS<sup>1</sup> was multiplied by the reduction in COVID-19 hospitalizations due to vaccines (i.e. number of hospitalizations without vaccines minus the number of hospitalizations with vaccines) to estimate overall savings from the reduced Medicare hospitalization stays. To estimate out-of-pocket spending reductions, we used MedPAC estimates that average cost sharing for Part A services across all Medicare beneficiaries was \$406 and average Part A spending per beneficiary was \$5,051 in 2019. This means that Medicare beneficiary cost-sharing averaged 7.4% of total Part A spending. Savings in beneficiary out-of-pocket spending were then estimated by multiplying the beneficiary

Part A spending proportion of 7.4% by the total estimated hospitalization cost savings; some of these savings in hospital out-of-pocket spending in practice are realized by supplemental or alternative coverage including Medicare Advantage, Medigap coverage, supplemental private insurance, or Medicaid.<sup>9</sup> In addition to being hospitalized, Medicare beneficiaries with COVID-19 may also use other services after hospital discharge including home health, skilled nursing facility, physician and other ambulatory services. The savings from these other services were not included in the estimates in this paper, which means our results likely underestimated the total cost savings and out-of-pocket savings among all Medicare beneficiaries due to vaccinations. Finally, we estimated the number of COVID-19 vaccine doses and series (i.e. two doses for the Pfizer and Moderna COVID-19 vaccines) that could have offset the estimated hospitalization cost savings among Medicare beneficiaries.

## FINDINGS

Table 1 shows that the estimated reduction in hospitalizations due to vaccines in early 2021 was approximately 107,000 among all Medicare beneficiaries. Using the average Medicare FFS cost per COVID-19 hospitalization, excluding beneficiary out-of-pocket spending,<sup>2</sup> the estimated total hospitalization savings associated with COVID-19 vaccinations among Medicare beneficiaries were approximately \$2.6 billion.

**\$2.6 billion**

*Savings in Medicare hospitalization costs associated with initial COVID-19 vaccinations in early 2021*

Based on the share of average out-of-pocket costs to average Part A spending paid by Medicare beneficiaries of 7.4%, Medicare beneficiary cost-sharing savings are estimated to

be about \$207 million in out-of-pocket spending for Part A services.<sup>\*9</sup> Again, some of these reductions in Medicare hospitalization costs and beneficiary out of pocket expenses are realized by supplemental or alternative coverage including Medicare Advantage, Medigap coverage, supplemental private insurance, or Medicaid.

**Table 1. Estimated Reduction in COVID-19 Hospitalizations and Cost Savings Among All Medicare Beneficiaries, January 2021-May 2021**

Outcome	Estimate
(A) Hospitalizations without vaccination	504,000
(B) Hospitalizations with vaccinations	397,000
(C) Reduced hospitalizations due to vaccinations (A-B)	107,000
(D) CMS average Medicare FFS cost per hospitalization	\$24,304
(E) Total Medicare Hospitalization Savings, Federal Spending (C*D)	\$2.6 Billion
(F) Savings in Out-of-Pocket Spending for Part A <sup>#</sup>	\$207 Million

**Notes:** Hospitalization estimates were reported in ASPE's previous research report and were predicted based on probabilities for the outcome from primary regression models with cumulative county-level weekly vaccination rates for ages 18-64 and 65+, controlling for beneficiary demographic characteristics, comorbidities, local county characteristics, and state and month fixed effects.

<sup>#</sup> Some of these costs in practice are born by supplemental or alternative coverage including Medicare Advantage, Medigap coverage, supplemental private insurance, or Medicaid.

\* Based on Medicare hospitalization cost savings of \$2.6B, the 7.4% out-of-pocket spending implies total hospitalization spending of \$2.6B \* 1.074 = \$2.8B, where the 7.4% out-of-pocket share of hospitalization savings represents \$207M.

Table 2 shows that the average cost for a vaccine was approximately \$40 per dose (vaccine price and administrative cost), which ranged from \$38.40 per Johnson and Johnson (J&J) single dose to \$93.30 per Pfizer-BioNTech two-dose series.<sup>10-12</sup> We do not have information about the total number of vaccine doses or the share of the three vaccines that were used by the Medicare population, so we are estimating about \$40 per dose.<sup>†</sup> Using \$40 as the approximate average cost of a vaccine dose, we calculate that approximately 67.7 million single doses of J&J or 31.2 million two-dose series of Pfizer-BioNTech or Moderna vaccines could have been paid for using the total COVID-19 hospitalization cost savings among Medicare beneficiaries from early 2021. For context, we estimate that approximately 44 million adults 65 and older were fully vaccinated during the study period (ending in May 2021).<sup>7,13</sup>

**Table 2. Estimates of COVID-19 Vaccine Doses to Offset Medicare Spending on COVID-19 Hospitalizations**

	(A) Price per dose	(B) Price per series or single dose <sup>10</sup> (2xA for Moderna and Pfizer-BioNtech)	(C) Administrative cost per series or dose <sup>11,12</sup> (\$16.94+\$28.39)	(D) Cost for a series or dose (B+C)	(E) Total Medicare hospitalization savings	(F) Number of series or single dose (E/D)	(G) Average number of series or single dose
Moderna	\$15	\$30	\$45.33	\$75.3	\$2.6B	34.5M	31.2M
Pfizer-BioNTech	\$24	\$48	\$45.33	\$93.3	\$2.6B	27.9M	31.2M
J&J	\$10	\$10	\$28.39	\$38.4	\$2.6B	67.7M	67.7M

**Notes:** Estimates using data on vaccines' prices and administrative cost. Column (F) presents number of vaccine doses that would offset the total Medicare hospitalization savings including the cost of the vaccine and the cost to administer the vaccine. The first two rows of Column (G) represent the average number of Moderna and Pfizer-BioNTech two-dose series, while the third row is the average number of J&J single dose vaccine to offset hospitalization cost savings among Medicare beneficiaries.

## CONCLUSION

This analysis estimates that hospitalization savings associated with COVID-19 vaccinations among Medicare beneficiaries totaled approximately \$2.6 billion from January 2021 through May 2021. Medicare beneficiary cost-sharing was also reduced by an estimated \$207 million from reduced COVID-19 hospitalizations. These savings estimates are conservative, as they do not reflect the costs of health care services and follow-up visits after a COVID-19 hospitalization. These estimates from early 2021 suggest that if Medicare had paid for the cost of the vaccines themselves in addition to the administration of the vaccines, the total federal hospitalization cost savings among all Medicare beneficiaries would have paid for vaccinations for 67.7M single-dose J&J vaccines, or 31.2 million two-dose series of Pfizer-BioNTech or Moderna vaccines, assuming an average cost of about \$40 per dose. This would have covered single-dose vaccinations among all 64 million Medicare beneficiaries.

Our estimates include hospitalization cost savings for Medicare FFS and MA. Distinct from FFS, MA plans realized some of the savings from reduced hospitalizations of vaccinated beneficiaries enrolled in MA plans. In addition, MA and Medigap plans also realized savings from reduced hospital deductibles and other out-of-pocket costs for beneficiaries who had a vaccine-prevented hospitalization. While some of the savings from

<sup>†</sup> The \$40 per dose average is the sum of cost of all doses or series of the three types of vaccines (Column D in Table 2) divided by the 5 doses of all types (2 doses for Moderna, 2 doses for Pfizer-BioNTech, and 1 dose for J&J). The average was \$41.4 per dose, which we rounded to \$40 per dose.

the first year of vaccinations may go to MA and Medigap plans, future savings likely would get incorporated into MA bids and benchmarks in later years and therefore contribute to savings to Medicare.

Our findings suggest that continued efforts to vaccinate all Medicare beneficiaries can prevent future COVID-19 hospitalizations and its associated costs. The costs of Medicare COVID-19 hospitalizations in 2020, prior to the availability of vaccines, has been estimated by one study to total \$5.6 billion, of which \$2.7 billion in costs were associated with the need for ventilators or a hospitalization that resulted in death.<sup>4</sup> Our savings estimates only reflect reduced hospitalizations among Medicare beneficiaries associated with vaccinations in early 2021 and do not include the effect of vaccinations on COVID-19 infections and hospitalizations during the waves from the Delta and Omicron variants in the later periods of 2021. Future analyses by ASPE will update estimates of the reduction in COVID-19 infections, hospitalizations, and deaths associated with vaccinations through the end of 2021 and estimate hospitalization costs prevented from COVID-19 vaccinations and boosters that were available to seniors in the second half of 2021. The updated estimates will likely show additional savings to Medicare and to beneficiaries from the ongoing COVID-19 vaccination efforts.

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