ASPE
ASSISTANT SECRETARY FOR PLANNING AND EVALUATION

OFFICE OF BEHAVIORAL HEALTH, DISABILITY, AND AGING POLICY

Rebalancing of Medicaid-Funded Long-Term Services and Supports, 2016-2019: Descriptive Analyses of National and State Rebalancing by Enrollee Age, Health Condition, and Demographic Factors

Prepared for
the Office of the Assistant Secretary for Planning and Evaluation (ASPE)
at the U.S. Department of Health & Human Services

by
RTI International

January 2025

Office of the Assistant Secretary for Planning and Evaluation

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This research was funded by the U.S. Department of Health and Human Services Office of the Assistant Secretary for Planning and Evaluation under Contract Number #HHSP233201500039I *and carried out by Research Triangle Institute. Please visit https://aspe.hhs.gov/topics/long-term-services-supports-long-term-care for more information about ASPE research on long-term services and supports (LTSS), or https://aspe.hhs.gov/topics/aging-disability for more information about ASPE research on aging and disability.*

REBALANCING OF MEDICAID-FUNDED LONG-TERM SERVICES AND SUPPORTS, 2016-2019: DESCRIPTIVE ANALYSES OF NATIONAL AND STATE REBALANCING BY ENROLLEE AGE, HEALTH CONDITION, AND DEMOGRAPHIC FACTORS

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January 15, 2025

Prepared for

Office of Behavioral Health, Disability, and Aging Policy
Office of the Assistant Secretary for Planning and Evaluation
U.S. Department of Health and Human Services
Contract #HHSP233201500039I

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List of Acronyms

ADL	Activities of Daily Living
ADRC	Aging and Disability Resource Centers
ASPE	Assistant Secretary for Planning and Evaluation
BIP	Balancing Incentive Program
CCW	Chronic Conditions Warehouse
CFC	Community First Choice
CMS	Centers for Medicare & Medicaid Services
COVID-19	Coronavirus Disease 2019
DD	Developmental Disability
DE	Demographic and Eligibility Research Identifiable File
FAI	Financial Alignment Initiatives
HCBS	Home and Community-Based Services
IAP	Innovation Accelerator Program
ICF	Intermediate Care Facility
ID	Intellectual Disability
ID/DD	Intellectual Disability/Developmental Disability
IID	Individuals with Intellectual Disabilities
IP	Inpatient Claims Research Identifiable File
LT	Long-Term Claims Research Identifiable File
LTSS	Long-Term Services and Supports
MFP	Money Follows the Person
NF	Nursing Facility
OT	Other Service Claims Research Identifiable File
PCS	Personal Care Services
RTI	Research Triangle Institute International
RX	Prescription Drug Claims Research Identifiable File
SSI	Social Security Income
TEP	Technical Expert Panel
T-MSIS	Transformed Medicaid Statistical Information System

1. Executive Summary

1.1 Background

Long-term services and supports (LTSS) help individuals with functional limitations, including older adults and individuals with disabilities, carry out activities of daily living (ADLs) (e.g., dressing, walking, eating) and instrumental activities of daily living (IADLs) (e.g., cleaning, shopping). LTSS are a variety of health, health-related, and social services that can be delivered in a range of institutional and home- and community-based settings.[1] Services delivered in institutional settings, such as nursing facilities, intermediate care facilities for individuals with intellectual disabilities (ICFs/IID), and mental health facilities, are collectively referred to as institutional LTSS. LTSS delivered in home and community settings, such as adult day, habilitation, home health aide, non-emergency medical transportation, and personal care, are referred to as home- and community-based services (HCBS).

Medicaid, the federal–state health insurance program for low-income and disabled populations, is the dominant insurance payor for LTSS in the United States.[2] Historically, Medicaid coverage for LTSS has been biased toward institutional settings because states were only mandated to cover medically necessary nursing facility care and skilled home health services for eligible enrollees. These initial coverage and reimbursement policies resulted in large groups of Americans with disabilities receiving services in institutional settings, regardless of the acuity of their care needs. The high cost of institutional LTSS, combined with enrollee preferences to remain in their homes and communities, catalyzed states and the federal government to introduce new HCBS programs.

Today, all state Medicaid programs voluntarily elect to provide at least some HCBS to eligible enrollees with disabilities. However, states vary significantly in their HCBS offerings by having unique enrollee eligibility criteria, service offerings, and combinations of policy mechanisms used to delivery HCBS (such as state plan amendments, 1915(c) waivers, or 1115 demonstrations). Over the last several decades, policy changes, including those made through legislative amendments, federal regulations, and court decisions, and federally funded grant programs have greatly expanded HCBS coverage options and supported the delivery of LTSS in the home and community.

With the increase in access to, and reimbursement of, HCBS, significant efforts from the U.S. Department of Health and Human Services (HHS), including the Centers for Medicare & Medicaid Services (CMS), and states have been undertaken to support Medicaid enrollees with disabilities remaining in their communities and receiving HCBS. This movement away from large-scale institutionalization toward home- and community-based care has been referred to as “rebalancing.” However, the term “rebalancing” can be seen as misleading, as it suggests balance had been achieved previously or that there is an ideal rate at which people with disabilities receive LTSS in communities verses institutions. A more appropriate interpretation of the term “rebalancing” is that it is a coordinated effort to provide LTSS in the setting most appropriate to an enrollee’s acuity of needs and personal care preferences.

Historically, official estimates of LTSS rebalancing efforts have been measured as the share of statewide Medicaid LTSS spending that went toward HCBS instead of institutional care, irrespective of actual service utilization patterns. Prior to federal fiscal year (FY) 2013, the proportion of Medicaid LTSS expenditures spent on HCBS was lower than the proportion spent on institutional LTSS nationally.[3] However, since FY 2013, Medicaid spending on HCBS has been greater than spending on institutional LTSS. For example, in FY 2019, CMS estimated spending on HCBS represented 59% of Medicaid LTSS expenditures, and, in FY 2020, an estimated 62% of Medicaid LTSS expenditures went toward HCBS.[3] However, Medicaid LTSS rebalancing varies by state. In FY 2019, spending on HCBS as a proportion of total Medicaid LTSS expenditures ranged from 33% to 83% across states,[4] and, in FY 2020, spending on HCBS ranged from 32% to 84% across states.[3]

The steady increase in rebalancing as measured by changes in statewide Medicaid spending tells us very little about the degree to which enrollees are receiving appropriate levels care in the most appropriate setting. It also obscures our ability to assess which subpopulations of enrollees are rebalancing faster than others. Use of, and spending on, HCBS (as a proportion of Medicaid LTSS use and spending) has been much lower for older adults than for other subpopulations of LTSS users. For example, in FY 2018, CMS estimated only 33% of Medicaid LTSS expenditures for older adults and people with physical disabilities or other disabilities was for HCBS, while almost 79% of Medicaid LTSS expenditures for individuals with ID/DD was for HCBS.[5] An older study by the Office of the Assistant Secretary for Planning and Evaluation (ASPE) and Mathematica, which was able to disaggregate older adults from younger adults with physical disabilities, estimated that in 2009, fee-for-service (FFS) spending on HCBS accounted for only 30% of all Medicaid LTSS expenditures for older adults compared with 49% for individuals younger than 65 with disabilities other than ID/DD and 65% for individuals younger than 65 with ID/DD.[6] It also found, among subgroups of LTSS users, 55% of older adults, 78% of individuals younger than 65 with disabilities other than ID/DD, and 86% of individuals younger than 65 with ID/DD received HCBS.[6]

With advances in Medicaid claims data, particularly via nationwide adoption of the Transformed Medicaid Statistical Information System (T-MSIS) in 2016, researchers and policy makers are now able to assess LTSS utilization more consistently in all states by enrollee characteristics, such as age and disability status. With T-MSIS also came more extensive reporting requirements for documenting service utilization under managed care plans that do not reimburse under a traditional FFS arrangement.

ASPE contracted with RTI International to assess HCBS use as a share of total Medicaid LTSS use using T-MSIS data. Specifically, this study sought to answer the following questions:

- What share of Medicaid LTSS use did HCBS use account for, nationally and by state, between 2016 and 2019?
- How has HCBS use, as a share of total Medicaid LTSS use, varied by certain age and ID/DD-related subpopulations (younger adults without ID/DD, younger adults with ID/DD, older adults without ID/DD, and older adults with ID/DD) and demographic characteristics?

- What state-level Medicaid programs and policies, population characteristics, and health system factors correlate with greater use of HCBS, as a share of total Medicaid LTSS use?

1.2 Methods

This study used a mixed-methodology approach comprising analyses of Medicaid enrollment and claims data, programmatic and policy analysis, and technical expert panels (TEPs).

We used T-MSIS Analytic File (TAF) Research Identifiable Files (RIFs) for years 2016 through 2019 to assess enrollee eligibility, enrollment, and service utilization in all settings and paid for via both FFS and managed care payment arrangements. We used demographic information and diagnosis codes to identify subpopulations of interest, including LTSS users who are age 65 and older with and without ID/DD and LTSS users who are younger than 65 with and without ID/DD. We created standardized LTSS outcomes for 49 states (omitting Florida because of poor data quality) and Washington, DC to determine patterns of service use and, ultimately, rebalancing. To supplement Medicaid claims data, we used state-level Medicaid program and policy, population characteristic, and health system factor data from a variety of secondary sources to assess how they may influence states' LTSS rebalancing.

We also convened three TEPs consisting of individuals with expertise in LTSS policy and Medicaid claims data analysis to solicit feedback on study methodology and findings. Throughout the course of the project, the TEPs provided feedback related to topics such as data quality, measurement specification, and interpretation of findings.

1.3 Key Findings

1.3.1 LTSS Utilization

Between 2016 and 2019, we identified approximately eight million Medicaid enrollees with claims for LTSS. Among all LTSS users, 59% of their Medicaid-covered months included at least one claim for HCBS, while 21% included a claim for institutional LTSS. Fifty-six percent of Medicaid LTSS users were younger adults (age 18 through 64) without ID/DD, while 7% were younger adults with ID/DD. Older adults (ages 65 and older) without ID/DD made up 39% of all LTSS users, while 1% were older adults with ID/DD.

Between 2016 and 2019, nationally, among all months during which Medicaid enrollees used any LTSS, enrollees used HCBS exclusively (without any institutional LTSS use) during 72.4% of those months. Use of HCBS, as a share of total LTSS use, varied by state. States with the highest rebalancing ratios included Oregon (93.0%), Alaska (91.1%), and Wisconsin (90.6%). Rhode Island (38.1%), Missouri (44.0%), and Louisiana (49.3%) had the lowest rebalancing ratios.

1.3.2 Subpopulation-Specific Rebalancing Ratios

Nationally, HCBS use accounted for the majority of younger adults' Medicaid LTSS use. Younger adults with ID/DD used HCBS exclusively during 88.9% of all months during which

they received any LTSS. Similarly, younger adults without ID/DD used HCBS exclusively during 86.8% of months during which they received any LTSS. Nationwide, older adults without ID/DD had the lowest ratio of LTSS rebalancing, using HCBS exclusively during 55.2% of all months in which they received any LTSS. Older adults with ID/DD had a slightly higher rebalancing ratio, using HCBS exclusively during 61.4% of all months in which they received any LTSS.

Rebalancing also varied by other demographic characteristics, including sex, dual eligibility status, residence in a non-metropolitan area, and by race and ethnicity. The national rebalancing ratio for females was slightly lower than the general population of LTSS users at 71.3% and 72.4%, respectively. Rebalancing also was lower among LTSS users who were dually eligible for Medicare and Medicaid, with a difference of 8.2 percentage points. Among states with credible race and ethnicity data, Hispanic and Asian LTSS users had rebalancing ratios of 85%, followed by non-Hispanic Black LTSS users at 78.2%. Non-Hispanic White enrollees were the least rebalanced population in every state except California, Hawaii, and Mississippi. In California and Hawaii, Asian LTSS users were the least rebalanced, while Hispanic LTSS users were least rebalanced in Mississippi.

1.3.3 State Programmatic and Policy Factors Have Variable Influence on Rebalancing

We found that most state-level LTSS and Medicaid coverage policies were not associated with the rebalancing outcome after accounting for person-level characteristics. However, in regression-adjusted models, state adoption of a self-directed personal care state plan was positively associated with rebalancing, while state adoption of any 1915(k) Community First Choice state plan option and state use of the state plan option allowing legally responsible adults to serve as HCBS providers were negatively associated with rebalancing.

We examined whether state participation in several federal initiatives designed to address rebalancing, as measured by a binary participation indicator, were associated with changes in rebalancing ratios. We found that state participation in programs like the Balancing Incentive Program, the Financial Alignment Initiative, and the IAP for HCBS were not significantly associated with statewide rebalancing ratios.

1.4 Conclusions

We found that rebalancing is highly variable across states and within state subpopulations. Among Medicaid enrollees using LTSS, older adults were significantly less rebalanced than younger adults, while persons with ID/DD were more rebalanced across all ages. Although this study showed high degrees of rebalancing variation across certain subpopulations, additional research is needed to understand what factors contribute to these differences, including availability of service providers and how different groups of LTSS users make decisions on their care needs and care setting. In particular, additional research is needed to understand what factors account for differences in rebalancing by age, race, ethnicity, and sex. Additionally, more quantitative and qualitative research is needed to understand the individual, community, and health system factors that influence enrollee transitions between home- and community-based

care and institutional settings. Lastly, future rebalancing research could reconsider the role of statewide spending and instead place greater emphasis on enrollee access to care, service utilization, quality of care, and patient experience measures.

2. Background

LTSS help individuals with functional limitations, including older adults and individuals with disabilities, carry out ADLs (e.g., dressing, walking, eating) and IADLs (e.g., cleaning, shopping). LTSS are a variety of health, health-related, and social services that can be delivered in a range of institutional and home- and community-based settings.[1] Services delivered in institutional settings, such as nursing facilities, ICFs/IID, and mental health facilities, are referred to as institutional LTSS. Services, such as adult day, habilitation, homemaker, home health aide, and personal care, delivered in home and community settings are referred to as HCBS.

Medicaid, the federal–state health insurance program for low-income populations, is the dominant public insurance payor for LTSS in the United States.[2] Medicaid, since its inception, has had an institutional bias regarding coverage of LTSS. States are required by law to cover medically necessary nursing facility care and skilled home health services in their Medicaid programs, but HCBS are generally optional for states to cover.[7] In addition, states are allowed to pay for room and board for Medicaid enrollees residing in nursing facilities, but are generally not allowed to cover housing costs for Medicaid enrollees living in the community and receiving HCBS. States may also choose to cap the number of people who can get services when covering HCBS under certain authorities (e.g., 1915(c) waivers and 1115 demonstrations). Historically, these policies have contributed to greater use of institutional LTSS than HCBS.

However, over the last several decades, policy changes, including those made through legislative amendments, federal regulations, and court decisions, along with federally funded grant programs, have expanded HCBS coverage options and supported the delivery of LTSS in the home and community.[7] For example, states have responsibilities to facilitate integration in community settings to comply with Title II of the Americans with Disabilities Act, as affirmed by the Supreme Court's *Olmstead* decision.[8] In addition, legislative amendments have added authorities (e.g., 1915(c) waivers, 1915(i), 1915(j), and 1915(k) state plan options, and 1115 demonstrations) under which states may elect to cover HCBS, expanding the scope of services and populations covered.[7]

These changes contributed to a shift in LTSS systems from use of, and spending on, institutional LTSS to use of, and spending on, HCBS. This shift is referred to as "rebalancing." The term rebalancing, rather than suggesting balance had been achieved previously or that there is an ideal ratio at which people with disabilities receive LTSS in communities and institutions, can be interpreted as a coordinated effort to provide LTSS in the setting most appropriate to an enrollee's acuity of needs and personal care preferences.

To support person-centered delivery of LTSS, in alignment with many LTSS users' preferences to live in the community, HHS (including CMS) and states have prioritized rebalancing LTSS systems. For example, in 2020, CMS released the Long-Term Services and Supports Rebalancing Toolkit,[7] which identifies promising state models and practices for strengthening state infrastructure to increase transitions from institutional settings to community-based

settings, prevent or delay institutionalization, and improve community living for individuals eligible for Medicaid HCBS.

Historically, LTSS rebalancing has been measured as the share of Medicaid LTSS spending that went toward HCBS. In FY 2013, for the first time, the proportion of Medicaid LTSS expenditures spent on HCBS surpassed the proportion of Medicaid LTSS expenditures spent on institutional LTSS nationally.[3] In FY 2019, CMS estimated spending on HCBS represented 59% of Medicaid LTSS expenditures and, in FY 2020, an estimated 62% of Medicaid LTSS expenditures went toward HCBS.[3] However, Medicaid LTSS rebalancing varies by state. In FY 2019, state-level spending on HCBS ranged from 33% to 83% of total Medicaid LTSS expenditures,[4] and, in FY 2020, state-level spending on HCBS ranged from 32% to 84%.[3]

The steady progress in rebalancing of Medicaid LTSS nationally also obscures variation by subpopulation. Use of, and spending on, HCBS (as a proportion of Medicaid LTSS use and spending) has been much lower for older adults than for other subpopulations of LTSS users. For example, in FY 2018, CMS estimated only 33% of Medicaid LTSS expenditures for older adults and people with physical disabilities or other disabilities was for HCBS, while almost 79% of Medicaid LTSS expenditures for individuals with ID/DD was for HCBS.[5] Findings from an evaluation of the Balancing Incentive Program mirrored this difference, with the share of LTSS spending that went toward HCBS lower for older adults and younger people with physical disabilities (35% in 2015) than for individuals with ID/DD (75% in 2015) among participating states, although older adults and younger people with physical disabilities saw a proportionally larger increase in the share of LTSS spending on HCBS during the study period (2009–2015).[9]

One limitation of these studies is that they were unable to disaggregate Medicaid LTSS rebalancing estimates for older adults and younger adults with physical disabilities. Prior research from ASPE and Mathematica was able to produce rebalancing estimates for each of these unique subpopulations (although only among FFS enrollees) using historical Medicaid Analytic Extract (MAX) data. These studies estimated much lower proportions of Medicaid LTSS spending for, and use of, HCBS for older adults, when compared to younger adults with physical disabilities and individuals younger than 65 with ID/DD. In 2006, FFS spending on HCBS accounted for only 26% of all FFS Medicaid LTSS expenditures for older adults, compared to 46% for individuals younger than 65 with disabilities other than ID/DD and 61% for individuals younger than 65 with ID/DD.[a,10] In 2006, among subgroups of LTSS users, 51% of older adults, 77% of individuals younger than 65 with disabilities other than ID/DD, and 85% of individuals younger than 65 with ID/DD used HCBS. Similarly, in 2009, FFS spending on HCBS accounted for only 30% of all Medicaid LTSS expenditures for older adults, compared to 49% for individuals younger than 65 with disabilities other than ID/DD and 65% for individuals younger than 65 with ID/DD.[b,6] Only a small number of states (10 or fewer in a given study year) spent 50% or more of their total Medicaid LTSS expenditures for older adults on HCBS. During the

[a] The estimate for older adults is based on data from 39 states and Washington, DC, while the estimates for individuals younger the 65 with disabilities other than ID/DD and with ID/DD are based on data from 37 states.
[b] The estimate for older adults is based on data from 37 states and Washington, DC, while the estimates for individuals younger the 65 with disabilities other than ID/DD and with ID/DD are based on data from 35 states.

same year, among subgroups of LTSS users, 55% of older adults, 78% of individuals younger than 65 with disabilities other than ID/DD, and 86% of individuals younger than 65 with ID/DD received HCBS.[6]

Given state-level variation in HCBS spending as a share of total Medicaid LTSS spending, it is important to consider what state characteristics are associated with a greater share of spending for HCBS. Prior ASPE research identified a small number of characteristics of state Medicaid LTSS systems that were associated with greater spending on HCBS: higher rates of personal and home care aides per 1,000 persons with a disability, higher number of self-directed LTSS participants per 1,000 persons with a disability, assisted living and residential care units per 1,000 persons over the age of 65, and increased adult day service rates.[6]

However, these ASPE studies have a few limitations: only estimating rebalancing metrics for Medicaid enrollees in FFS payment arrangements, excluding certain states from analyses because of use of managed care in those states, and unavailable Medicaid enrollment and claims data for a number of states. These study limitations were due to the use of an older type of Medicaid claims data available at the time (MAX research files), which included claims paid through FFS arrangements, but not managed care encounter or payment data.[11] As such, information on LTSS spending and use for older adults, separate from other subpopulations of LTSS users, was not available for Medicaid enrollees receiving LTSS through managed care arrangements and states with substantial use of managed LTSS.

Since the 2009 ASPE study among FFS enrollees, use of managed care for LTSS has increased dramatically. In 2004, only eight states provided LTSS through managed care arrangements: Arizona, Florida, Massachusetts, Michigan, Minnesota, New York, Texas and Wisconsin.[12] In 2012, the number had grown to 16 states with the addition of California, Delaware, Hawaii, New Mexico, North Carolina, Pennsylvania, Tennessee, and Washington.[13] The number of states continued to grow to 24 states in 2021.[14] During this time, Medicaid programs have undergone significant restructuring to comprehensive managed care plans for enrollees, including many LTSS users. Although half of all states now provide LTSS via managed care, the number of specialty managed LTSS (MLTSS) programs has steadily declined as more enrollees participate in comprehensive managed care plans, which often include all LTSS, thus obfuscating the need for a specialty MLTSS authority. In 2017, CMS estimated that 871,052 Medicaid enrollees were receiving LTSS through a managed care arrangement, with most (72%) receiving MLTSS via a comprehensive managed care plan; only five states continued to report MLTSS-only managed care plans (Florida, Illinois, Michigan, New York, and Wisconsin).[15] This growing emphasis on integrating MLTSS into comprehensive managed care plans continues to grow, with 82% of all managed LTSS being delivered via a comprehensive care plan in 2021.[14]

Given the data limitations described previously, this expansion of the delivery of LTSS via managed care prevented more recent analyses of rebalancing metrics by specific age and health condition-related subpopulations until CMS introduced T-MSIS. T-MSIS represents an effort to modernize Medicaid claims data, standardize data across states, and accommodate increased reporting requirements for managed care services. T-MSIS went live for state

submissions in 2013, with four states (Alaska, Florida, Kansas, and North Carolina) all initiating early transformation. State adoption of T-MSIS was staggered, with all states being required to complete the transition by October 1, 2015. The first year with complete T-MSIS data for all states was 2016. The timing of this study's analytic period, 2016 through2019, was selected to begin after the transition to T-MSIS was complete and end prior to the start of the coronavirus disease 2019 (COVID-19) public health emergency in January 2020. Modern T-MSIS claims data offers numerous benefits for research over aggregated data sources, such as CMS-64 expenditure reports, including the ability to study LTSS use by specific populations.

2.1 Objectives of Study

ASPE contracted with RTI to assess HCBS use as a share of total Medicaid LTSS use using T-MSIS data. Specifically, this study sought to answer the following questions:

- What share of Medicaid LTSS use did HCBS use account for, nationally and by state, between 2016 and 2019?
- How has HCBS use, as a share of total Medicaid LTSS use, varied by certain age and ID/DD-related subpopulations (younger adults (18–64) with and without ID/DD and older adults (65+) with and without ID/DD) and demographic characteristics?
- What state-level Medicaid programs and policies, population characteristics, and health system factors correlate with greater use of HCBS, as a share of total Medicaid LTSS use?

3. Data and Methods

To answer the study questions, we used a mixed-methods approach comprising analysis of Medicaid enrollment and claims data, programmatic and policy analysis, and TEPs.

3.1 Data

3.1.1 Medicaid Enrollment and Claims Data

To estimate measures of rebalancing, as well as assess correlations between state characteristics and use of HCBS, we used data from several sources. Primarily, we used TAF RIF for years 2016 through 2019. T-MSIS is the system through which states, the District of Columbia, and territories report Medicaid enrollment, demographic, service use, and payment information. The TAF RIF contain research-optimized T-MSIS data, including all final action claims submitted to a Medicaid agency. Specifically, we used the following TAF RIF: the Demographic and Eligibility (DE) File, which contains information on enrollee characteristics and Medicaid coverage details; the Inpatient (IP) File, which contains information on inpatient hospital stays; the Other Services (OT) File, which contains information on use of various services, including HCBS; the Long-Term Care (LT) File, which contains information on nursing facility and other institutional LTSS use; and the Pharmacy (RX) File, which contains information on filled prescriptions. The claims files (IP, OT, LT, and RX) include FFS claims, managed care encounters, capitated payments, and supplemental payments. We accessed TAF RIF data using CMS Chronic Conditions Warehouse (CCW) Virtual Research Data Center between November 2022 and May 2024. For a table of data elements used in our analysis, please refer to **Table A-5** in ***Appendix A***.

3.1.2 Supplemental Data

We supplemented TAF data with data from several other sources. First, we used county-level data from the Census Bureau, in conjunction with county-level claims data, to establish whether a Medicaid enrollee lived in an urban or rural area. Second, we used a Claims-Based Frailty Index created by Kim et al.[16] to measure the level of frailty of each enrollee, which was then aggregated to determine average state-level frailty, which we used in meta-regression analyses. Third, we collected state-level data on Medicaid programs and policies, population characteristics, and health system factors from a variety of sources, including AARP Foundation, Bureau of Economic Analysis (BEA), Bureau of Labor Statistics (BLS), Census Bureau, CMS, KFF (formerly Kaiser Family Foundation), Medicaid and CHIP Payment and Access Commission (MACPAC), and Social Security Administration (SSA). For example, we sourced Medicaid program data primarily from KFF state surveys; personal care assistant wage and regional price parity data from BLS and BEA, respectively; and health system factors, such as No Wrong Door progress and availability of assisted living units, from AARP Foundation. For a table of variables and their respective data sources, please refer to **Table A-2**.

3.1.3 Technical Expert Panels

In addition, to obtain expert input on data quality, study methods, and study findings, we convened three TEPs. Panels were convened on February 27, 2023, October 23, 2023, and March 25, 2024. Panelists included representatives from CMS, including data specialists, and the Administration for Community Living (ACL), staff from state Medicaid agencies, researchers with experience analyzing Medicaid LTSS data, staff from policy organizations, and representatives from consumer advocacy groups.

For a full description of data used in this study, refer to ***Appendix A***.

3.2 Methods

3.2.1 Identifying LTSS Use

To estimate Medicaid LTSS use, we first identified a study population of LTSS users nationwide. Our study population included adult Medicaid enrollees, ages 18 and older, who used LTSS between 2016 and 2019. Medicaid enrollees were included in the study population if they used LTSS (either institutional LTSS, HCBS, or both) for at least one month in a given year during our study period. **Figure 3-1** provides an overview of inclusion criteria.

When considering how to identify LTSS use, we assessed the quality of HCBS program participation data in the DE file (i.e., documented participation in a 1915(c) waiver, 1915(i) state plan option, 1915(j) state plan option, or 1915(k) state plan option). However, we found this enrollment data substantially undercounted program participants compared with external benchmarks. Therefore, we used claims and encounter data to identify LTSS use. For additional information on our data quality assessment, refer to ***Appendix A***.

We defined Medicaid enrollees as having used HCBS if they had at least one claim or encounter either paid for by a HCBS waiver or state plan option (i.e., 1915(c) waivers, 1915(i) state plan options, 1915(j) state plan options, and 1915(k) state plan options) or for HCBS case management services, personal care services, home health services, or private duty nursing services (with place of service exclusions) in the OT file. All claims and encounters that met HCBS inclusion criteria were included in analyses, regardless of the HCBS authority under which they were covered (i.e. 1915(c) waivers, 1915(i) state plan options, 1915(j) state plan options, and 1915(k) state plan options, 1115 HCBS waivers, or other personal care coverage).

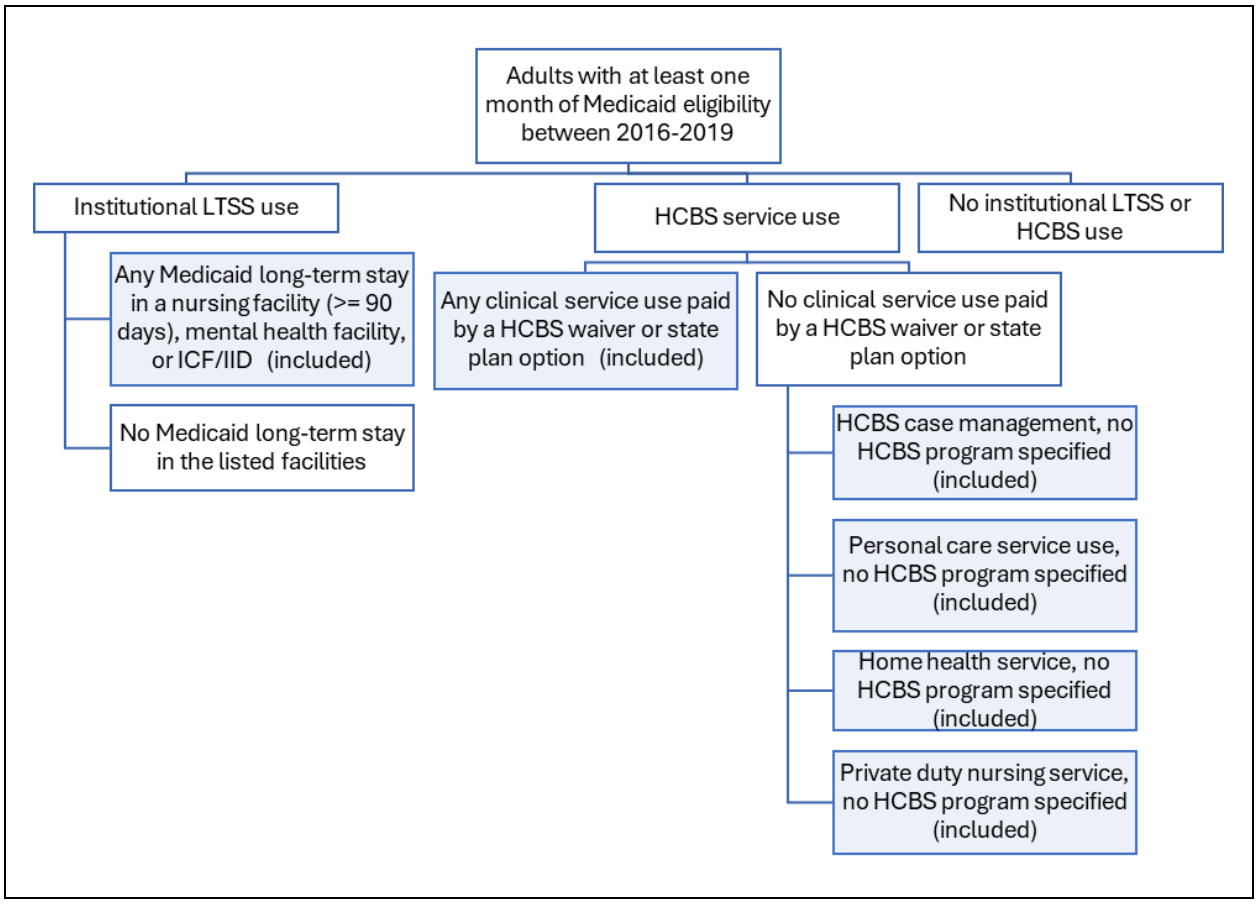
We defined Medicaid enrollees as having used institutional LTSS if they had claims or encounters for a nursing facility stay of 90 days or longer or ICF/IID or mental health facility (without a minimum length of stay) in the LT file.

We consulted the TEP for buy-in and review of our methodology. Once TEP members had reviewed the availability, quality, and usability of indicators available in the TAF DE file to determine LTSS eligibility, panelists supported the approach of using utilization-based criteria to identify LTSS users. However, TEP participants did point out that this methodology may underreport enrollees who are eligible for HCBS, but are unable to access services (e.g., due to

direct care worker shortages), and that certain types of HCBS may be commonly used, but not accurately reflected in claims.

After identifying the LTSS population, we removed months where enrollees were under the age of 18, as well as enrollees with no positive payments on any claims in a given year.

Figure 3-1. Claims-based Criteria for Identifying LTSS Users



After identifying a population of LTSS users, we identified four age and ID/DD-related subpopulations of interest among all LTSS users:

- Younger adults (ages 18–64) without any claims-based diagnosis of ID/DD;
- Younger adults (ages 18–64) with a claims-based diagnosis of ID/DD;
- Older adults (ages 65 and older) without any claims-based diagnosis of ID/DD; and
- Older adults (ages 65 and older) with a claims-based diagnosis of ID/DD.

We calculated descriptive metrics for these four subpopulations, as well as stratifying LTSS users by select enrollee characteristics: sex, race, ethnicity, dual eligibility status, and living outside of a metropolitan area based upon Medicaid enrollment files. For additional information on subpopulation inclusion criteria, see ***Appendix A***.

3.2.2 Descriptive Analyses

We calculated several descriptive metrics of LTSS use. Specifically, we calculated months of HCBS use, months of institutional LTSS use, and HCBS use as a proportion of total LTSS use (i.e., rebalancing ratio). We also estimated transitions from use of only HCBS to use of only institutional LTSS and vice versa, defined as changes in service use from one month to the next. Some states were fully or partially omitted from analysis because of data quality concerns: Arkansas (2016), Colorado (2017), Florida (2016–2019), Kansas (2016), Louisiana (2016), Massachusetts (2016), Nebraska (2016), Nevada (2016), North Carolina (2016), Rhode Island (2018–2019), Tennessee (2016), Utah (2016), and West Virginia (2017).

Any HCBS Use

States and their managed care organizations vary significantly in how they submit claims for HCBS, with some submitting monthly and others submitting daily. Although T-MSIS includes variables intended to quantify the units of HCBS delivered to an individual per claim, these variables are difficult to compare across managed care plans and states because of variability in state policies and billing practices.

In light of these known data submission variations, we operationalized a binary indicator measuring whether an enrollee had any claim for HCBS in a given calendar month, contingent upon concurrent Medicaid eligibility. Enrollees who met these criteria may also have had concurrent institutional LTSS use in a given month. We defined HCBS use as all criteria mentioned previously for inclusion in the study population based on HCBS use, as well as additional types of HCBS identified in OT file claims. Additional types of HCBS were identified from a HCBS taxonomy developed by Rooney et al.[17] and an internal review of relevant variables. See **Table A-7** for a full list of additional services. Using this information, we calculated the percentage of months with at least one claim for HCBS out of all months during which LTSS users were enrolled in Medicaid.

Any Institutional LTSS Use

Similarly to HCBS, states and managed care organizations vary significantly in how they submit claims for institutional LTSS, with some submitting weekly and others submitting monthly. Although T-MSIS includes variables intended to quantify the units of institutional LTSS delivered to an individual per claim, these variables are difficult to compare across managed care plans and states due to variability in state policies and billing practices.

Given these known data submission variations, we operationalized a binary indicator measuring whether an enrollee had any claim for an institutional stay in a given calendar month, contingent upon concurrent Medicaid eligibility. We defined institutional LTSS use as a stay in a nursing facility of 90 days or longer, a stay in an ICF/IID, or a stay in a mental health facility. Refer to ***Appendix A*** for a list of type of service code values used to identify institutional LTSS use. Using this information, we calculated the percentage of months with at least one claim for a long-term institutional stay out of all months during which LTSS users were enrolled in Medicaid.

Rebalancing Ratio

Historically, rebalancing has been measured primarily as the percentage of Medicaid spending on LTSS that went toward HCBS. However, this metric can only be used for a handful of states because it can reliably measure only payments made in a FFS payment model. As discussed in **Section 2**, many states have adopted at least some form of MLTSS and use capitated payments, which cannot be tied directly to particular types of utilization. Given the challenges with estimating enrollee-level spending in managed care environments, most prior research relies on aggregate, state-supplied cost report data.[3] Although these data provide states' accounts of how much money was spent on HCBS and institutional LTSS, it cannot reliably estimate the number of enrollees using LTSS by sociodemographic, health condition, or other individual characteristics.

Given newly available and revised data fields in T-MSIS, we attempted to generate Medicaid spending estimates per service unit of HCBS. However, missing payment information, service unit inconsistencies, and clear disassociations between total capitated spending and service units utilized yielded unreliable estimates. With many LTSS users now participating in MLTSS or comprehensive managed care plans that separate spending from service use, we determined that the available data could not accurately delineate Medicaid spending for either HCBS or institutional LTSS. The challenge of assessing spending as it relates to direct service use is not specific to LTSS or Medicaid; researchers and policy makers must consistently address this issue for all services rendered under a managed care payment schema in both public and private insurance plans alike.

In the absence of reliable service-level spending data, we measured rebalancing via a utilization metric. Specifically, we assessed rebalancing as the ratio of months with at least one claim for HCBS (and no claims for institutional LTSS) per months with at least one claim for LTSS use (HCBS, institutional, or both). This metric approximates the percentage of months that LTSS users exclusively used HCBS.

Total Medicaid Spending

Although we did not calculate a spending-based rebalancing measure, we did calculate total Medicaid spending for LTSS users by dual eligibility status, both nationally and by state. Total Medicaid spending was defined as the sum of spending in three categories: FFS, managed care, and other.

LTSS Transitions Analysis

We created two measures to determine the proportion of LTSS users transitioning from using HCBS to using institutional LTSS and vice versa. The institutional LTSS transition metric is calculated as the percentage of months with only claims for institutional LTSS use that had only claims for HCBS use in the following month. The HCBS transition metric follows the same convention—it is defined as the percentage of months with only claims for HCBS use that had claims for institutional LTSS use in the following month.

State Factor Correlations with Rebalancing

We calculated Pearson[18] pairwise correlation coefficients with tests of statistical significance to assess unadjusted correlations between states' rebalancing ratios and state characteristics (such as Medicaid program and policy adoption, health system characteristics, and other state characteristics). The strength of these associations was estimated within the overall LTSS user population, as well as within the four age and ID/DD-related subpopulations. Unadjusted correlations contextualize meta-regression results that control for all state characteristics in the model by isolating the relationship between the rebalancing ratio and each state characteristic.

3.2.3 Meta-Regression Analysis

After developing descriptive statistics described previously, we observed various state-level data irregularities with HCBS use or payment trends for specific years that did not match any known policy changes in those states and years, so we elected to exclude certain years of state data from the meta-regression analysis (see **Table A-1**).

We used a two-stage multivariate meta-regression analysis to assess relationships among state-level Medicaid programs and policies, population characteristics, and health system factors and rebalancing ratios. For the first stage of the analysis, we used generalized linear models to examine independent associations between LTSS users' characteristics and our main outcomes: rebalancing ratio, HCBS use, institutional LTSS use, and total Medicaid spending. In all these models, we used covariates for state, year, age, race and ethnicity, sex, dual eligibility status, presence of a mental health diagnosis, presence of an ID/DD diagnosis, urbanicity, proportion of an enrollee's payments that were capitated, use of 1915(c)/1915(i)/1915(j)/1915(k) HCBS programs, medically needy status, frailty score, flags for the four age and ID/DD-related subpopulations, and flags for these subpopulations interacted with the state variable. We also included flags indicating when values were missing for the demographic variables and proportion of capitated payments. The models produced predicted values and standard errors for each state that we used as inputs to the second stage of our analysis. Each model provided five sets of estimates: an estimate for the population overall and one estimate for each of the four age and ID/DD-related subpopulations.

The second stage meta-regression model pooled together findings and error terms from the first stage state-specific models and included time-invariant programmatic, policy, population, and health system factors from each state, leading to a single model for the United States; see **Appendix A** for additional model details. Using this meta-regression model, we assessed associations between these factors and rebalancing ratios, after controlling for person-level characteristics. Because of heterogeneity in how states leverage their programs and policies across the four age and ID/DD-related subpopulations of interest, the meta-regression model was only run on the state-level rebalancing ratios for the population of LTSS users overall.

Additional details on the data and methods are included in **Appendix A**.

3.3 Limitations

Analyses used Medicaid enrollment and claims data submitted by states to CMS via T-MSIS. Although T-MSIS contains a wealth of indicators related to Medicaid enrollees using LTSS, including their service use and costs, the value of the data is contingent upon the completeness and accuracy of state Medicaid agency submissions. Our team conducted an exhaustive analysis of state-submitted data related to Medicaid enrollment, participation in HCBS waivers, participation in state plans, managed care enrollment, LTSS utilization, and related spending. We found widespread data quality issues related to waiver and state plan participation, race and ethnicity markers, and managed care payments tied to services. Because of the poor quality of submitted data, we were not able to assess research questions related to participation in select waivers and state plan programs, including those for self-directed services. Additionally, missing payment information for managed care encounters rendered it impossible to assess state spending by type of service. Despite these challenges, we found that overall patterns of HCBS and institutional LTSS use, as operationalized by our monthly outcomes, were generally robust over the 4-year study period. Select outcomes and years of data were omitted from some states if anomalous trends were observed.

Despite T-MSIS validation efforts conducted by CMS and our own data quality assessment, we acknowledge the limitations of claims-based research. Although CMS requires states to submit all enrollment records, claims, and managed care encounters, our estimates will underreport enrollee counts and utilization rates if states fail to submit complete enrollment records or claims. To allow for anticipated underreporting of managed care encounters, we operationalized utilization as an “if ever in a month” outcome. However, if encounters or claims for LTSS were not properly submitted to T-MSIS at least once in a calendar month, our estimates will be lower than actual service use. For additional information on our data quality review process and assessment, see **Appendix A**.

In addition to submission errors, CMS does not recognize a singular definition of what constitutes LTSS across state Medicaid programs. We conducted a thorough review of literature and elected to use a schema based on several factors, including billing codes related to procedures, place of service, type of service, program type, and others. Our definition aimed to capture the largest national sample of Medicaid enrollees we could systematically and confidently consider LTSS users. Estimates of LTSS users and rebalancing ratios produced using alternative definitions for LTSS may differ from our estimates.

This analysis incorporated state-level policy and programmatic, population, and health system data from a number of secondary data sources. We collected, analyzed, and aggregated these data in a variety of ways, including policy scans, environmental assessments, and other methods by external parties. We did not attempt to verify the accuracy of all this information.

Our analyses, both descriptive and regression-adjusted, are associative in nature only. We did not assume nor test for any causal pathway between these state factors and related outcomes of interest. Any associations that exist cannot be interpreted as causal and may reflect the effects of other unobserved influences. Although our meta-regression accounts for the influence

of concurrent factors, it also is descriptive. By conducting state-level analysis across the entire country, we had to develop binary indicators of programs and policies that cannot account for the state-specific nuances of implementation.

4. Key Findings

4.1.1 Descriptive Analyses

Distribution of LTSS Users by Age and ID/DD Diagnosis

Approximately eight million Medicaid enrollees had claims for LTSS during the study period (2016–2019) (**Table 4-1**). Thirty-nine percent of LTSS users were older adults without an ID/DD diagnosis, while 1% were older adults with ID/DD. Fifty-six percent of LTSS users were younger adults without an ID/DD diagnosis, while 7% were younger adults with ID/DD.

Table 4-1. LTSS Users by Age and ID/DD Diagnosis, 2016–2019

			Age 18–64				Age 65+			
	All LTSS Users		Without ID/DD		With ID/DD		Without ID/DD		With ID/DD	
State	n	%*	n	%	n	%	n	%	n	%
United States	**8,051,393**	**100**	**4,542,262**	**56**	**547,729**	**7**	**3,179,880**	**39**	**57,849**	**1**
Alabama	97,472	100	58,586	60	5,210	5	36,744	38	544	1
Alaska	10,953	100	4,353	40	1,576	14	5,418	49	75	1
Arizona	98,703	100	57,916	59	6,977	7	36,130	37	380	<1
Arkansas[a]	50,086	100	24,574	49	3,674	7	23,156	46	337	1
California	480,486	100	252,208	52	71,456	15	162,768	34	6,377	1
Colorado[a]	104,485	100	53,752	51	9,251	9	44,955	43	934	1
Connecticut	110,746	100	50,328	45	7,182	6	55,995	51	1,084	1
Delaware	28,366	100	18,102	64	2,000	7	8,867	31	244	1
District of Columbia	31,012	100	20,473	66	1,313	4	10,555	34	193	1
Florida[b]	—	—	—	—	—	—	—	—	—	—
Georgia	214,936	100	135,699	63	11,196	5	73,433	34	978	<1
Hawaii	41,624	100	27,335	66	1,770	4	13,805	33	167	<1
Idaho	32,622	100	13,191	40	4,828	15	15,706	48	295	<1
Illinois	284,159	100	110,598	39	18,120	6	168,315	59	2,309	1
Indiana	139,409	100	56,955	41	12,835	9	73,669	53	1,045	1
Iowa	72,334	100	31,672	44	7,166	10	35,180	49	795	1
Kansas[a]	49,880	100	20,622	41	5,213	10	25,290	51	423	1
Kentucky	99,803	100	51,668	52	9,696	10	40,559	41	847	1
Louisiana[a]	91,441	100	42,164	46	8,509	9	43,345	47	758	1
Maine	34,535	100	11,734	34	3,936	11	19,643	57	397	1
Maryland	168,048	100	113,504	68	11,043	7	43,673	26	3,863	2
Massachusetts[a]	226,799	100	95,297	42	16,105	7	121,369	54	2,464	1
Michigan	215,007	100	148,583	69	11,499	5	59,119	27	1,370	1
Minnesota	163,078	100	77,460	47	18,776	12	72,023	44	1,670	1

			Age 18–64				Age 65+			
	All LTSS Users		Without ID/DD		With ID/DD		Without ID/DD		With ID/DD	
State	n	%*	n	%	n	%	n	%	n	%
Mississippi	65,382	100	25,864	40	3,633	6	38,432	59	1,060	2
Missouri	148,063	100	73,423	50	7,204	5	75,153	51	822	1
Montana	15,794	100	6,682	42	1,789	11	7,707	49	269	2
Nebraska[a]	25,844	100	7,073	27	2,859	11	16,337	63	282	1
Nevada[a]	30,183	100	14,983	50	2,495	8	13,596	45	161	1
New Hampshire	39,549	100	22,386	57	2,971	8	14,919	38	211	1
New Jersey	163,867	100	59,424	36	14,833	9	93,645	57	1,801	1
New Mexico	142,043	100	116,478	82	5,195	4	23,972	17	465	<1
New York	1,152,512	100	660,847	57	59,223	5	464,192	40	5,790	1
North Carolina[a]	179,099	100	83,648	47	14,984	8	85,582	48	1,487	1
North Dakota	13,535	100	3,811	28	1,499	11	8,485	63	169	1
Ohio	310,767	100	141,818	46	26,007	8	154,919	50	3,015	1
Oklahoma	75,676	100	31,431	42	4,668	6	42,755	56	741	1
Oregon	231,631	100	176,201	76	6,143	3	56,194	24	747	<1
Pennsylvania	807,777	100	597,523	74	29,632	4	196,920	24	2,695	<1
Rhode Island[a]	14,008	100	4,026	29	696	5	9,475	68	90	1
South Carolina	83,459	100	38,920	47	8,714	10	38,650	46	760	1
South Dakota	14,223	100	4,111	29	1,816	13	8,524	60	250	2
Tennessee[a]	192,344	100	142,823	74	7,864	4	43,650	23	1,151	1
Texas	707,786	100	376,794	53	42,728	6	315,160	45	2,971	<1
Utah[a]	67,330	100	50,398	75	5,869	9	11,386	17	861	1
Vermont	19,011	100	8,229	43	2,144	11	9,061	48	226	1
Virginia	126,979	100	49,970	39	12,333	10	68,353	54	1,253	1
Washington	149,146	100	71,314	48	10,201	7	73,150	49	874	1
West Virginia[a]	85,531	100	56,221	66	4,203	5	27,467	32	476	1
Wisconsin	317,060	100	220,625	70	17,347	5	87,029	27	1,572	<1
Wyoming	26,810	100	20,465	76	1,348	5	5,450	20	101	<1

Source: RTI analysis of TAF RIF enrollment and claims data, 2016–2019.
Notes: *The subpopulation percentages may not always sum to 100% because enrollees who changed subpopulations during the study period (e.g., turned 65) are counted in all subpopulations to which they belonged during the study period. [a]These states had at least one year in the study period that was omitted from analyses due to data quality concerns. See Appendix A for more details. [b]Florida was omitted from analyses, as two years had a high proportion of enrollees with LTSS use but no paid claims. See Appendix A for more information.

Notably, LTSS population composition varied by state. Among LTSS users, Rhode Island (68%), Nebraska (63%), North Dakota (63%), South Dakota (60%), and Mississippi (59%) had the greatest proportions of older adults without ID/DD; New Mexico (17%), Utah (17%), Wyoming (20%), Tennessee (23%), and Oregon (24%) had the smallest. Maryland, Montana, Mississippi, and South Dakota had slightly higher proportions of LTSS users who were older

adults with ID/DD (2%). New Mexico (82%), Wyoming (76%), Oregon (76%), Utah (75%), and Tennessee (74%) had the largest proportions of younger adults without ID/DD, while Nebraska (27%), North Dakota (28%), Rhode Island (29%), South Dakota (29%), and Maine (34%) had the smallest percentages. California (15%), Idaho (15%), Alaska (14%), South Dakota (13%), and Minnesota (12%) had the largest percentages of younger adults with ID/DD, while Oregon (3%), New Mexico (4%), Pennsylvania (4%), Tennessee (4%), and the District of Columbia (4%) had the smallest.

LTSS Utilization

During the study period, among the approximately eight million LTSS users, 59% of their Medicaid-covered months included claims for HCBS while 21% included claims for institutional LTSS (**Table 4-2**). At the state level, percentages of months with HCBS use ranged from 21.2% (Missouri) to 99% (Nebraska); percentages of months with institutional LTSS use range from 4.1% (Oregon) to 51.8% (Rhode Island).

Table 4-2. LTSS Utilization by State and Type of Service, 2016–2019

State	Unique Medicaid Enrollees with LTSS Use	% Medicaid-Covered Months with Any Use	
		HCBS	Institutional LTSS
United States	8,051,393	59.0	21.0
Alabama	97,472	45.3	33.7
Alaska	10,953	82.8	8.0
Arizona	98,703	27.4	17.0
Arkansas [a]	50,086	77.8	11.4
California	480,486	60.6	31.7
Colorado [a]	104,485	75.9	17.1
Connecticut	110,746	59.1	27.7
Delaware	28,366	51.3	23.9
District of Columbia	31,012	61.9	17.2
Florida[b]	—	—	—
Georgia	214,936	94.1	26.4
Hawaii	41,624	44.2	11.7
Idaho	32,622	68.3	14.6
Illinois	284,159	53.9	26.6
Indiana	139,409	52.6	38.3
Iowa	72,334	54.1	29.7
Kansas[a]	49,880	62.7	30.8
Kentucky	99,803	40.7	35.4
Louisiana[a]	91,441	43.6	44.2
Maine	34,535	43.9	21.8
Maryland	168,048	58.7	21.1
Massachusetts[a]	226,799	70.0	19.0

State	Unique Medicaid Enrollees with LTSS Use	% Medicaid-Covered Months with Any Use	
		HCBS	Institutional LTSS
Michigan	215,007	97.2	26.4
Minnesota	163,078	56.2	15.4
Mississippi	65,382	58.4	35.7
Missouri	148,063	21.2	26.8
Montana	15,794	50.4	34.7
Nebraska[a]	25,844	99.0	44.8
Nevada[a]	30,183	67.4	17.9
New Hampshire	39,549	92.5	25.8
New Jersey	163,867	55.3	27.3
New Mexico	142,043	55.3	6.3
New York	1,152,512	63.0	14.6
North Carolina[a]	179,099	58.7	25.0
North Dakota	13,535	56.1	44.7
Ohio	310,767	57.3	29.6
Oklahoma	75,676	63.9	34.3
Oregon	231,631	54.7	4.1
Pennsylvania	807,777	41.8	16.4
Rhode Island[a]	14,008	37.2	51.8
South Carolina	83,459	64.1	23.4
South Dakota	14,223	53.8	38.0
Tennessee[a]	192,344	66.0	19.4
Texas	707,786	49.7	16.8
Utah[a]	67,330	56.5	11.2
Vermont	19,011	84.2	16.8
Virginia	126,979	88.0	25.2
Washington	149,146	74.1	13.1
West Virginia[a]	85,531	48.4	19.3
Wisconsin	317,060	80.2	7.9
Wyoming	26,810	47.6	14.0

Source: RTI analysis of TAF RIF enrollment and claims data, 2016–2019.
Notes: [a] These states had at least one year in the study period that was omitted from analyses because of data quality concerns. See Appendix A for more details. [b] Florida was omitted from analyses, as two years had a high proportion of Medicaid enrollees with LTSS use but no paid claims. See Appendix A for more information.

In some states, including Nebraska, Georgia, and Michigan, there was a high occurrence of co-occurring HCBS and institutional LTSS use within the same month for an individual (see **Table B-1**). The most common scenario of co-occurring HCBS and institutional LTSS use involved states billing for institutional services in tandem with an HCBS-specific case management code. As described in **Section 3**, any month with co-occurring HCBS and institutional LTSS use was omitted from all rebalancing analysis because the location of LTSS service delivery could not be

definitively determined. This methodological approach prioritizes estimate precision and may differentially impact rebalancing ratios in states with high rates of co-occurring institutional LTSS and HCBS use.

Rebalancing

Nationally, the rebalancing ratio among all LTSS users was 72.4%, indicating that for all months in which Medicaid enrollees used any LTSS between 2016 and 2019, 72.4% of those months had at least one claim for HCBS and no concurrent claims for long-term institutional LTSS (**Table 4-3**). Rebalancing ratios varied across states, with Oregon (93.0%), Alaska (91.1%), Wisconsin (90.6%), New Mexico (89.6%), and Arkansas (86.9%) having the highest rebalancing ratios. Rhode Island (38.1%), Missouri (44.0%), Louisiana (49.3%), North Dakota (52.1%), and Kentucky (53.4%) had the lowest ratios (**Table 4-3**).

Table 4-1. Rebalancing Ratio by Age and ID/DD, Nationally and by State, 2016–2019

State	All LTSS Users	Age 18–64		Age 65+	
		Without ID/DD	With ID/DD	Without ID/DD	With ID/DD
United States	**72.4**	**86.8**	**88.9**	**55.2**	**61.4**
Alabama	55.2	80.3	84.7	27.7	40.4
Alaska	91.1	93.7	97.6	86.6	90.4
Arizona	61.4	74.4	95.2	31.4	42.4
Arkansas[a]	86.9	93.6	95.9	77.5	82.9
California	62.8	77.8	89.7	26.6	48.8
Colorado[a]	80.6	90.6	96.7	65.3	82.3
Connecticut	67.5	85.1	90.2	52.0	63.5
Delaware	67.6	81.4	91.2	44.4	77.1
District of Columbia	77.7	87.3	85.6	64.1	57.7
Florida[b]	—	—	—	—	—
Georgia	72.7	89.7	92.9	46.6	58.6
Hawaii	78.9	93.4	93.5	59.5	80.4
Idaho	82.2	91.6	91.2	67.2	64.1
Illinois	65.7	68.5	74.2	62.9	48.1
Indiana	57.2	77.8	81.4	33.9	48.4
Iowa	64.2	84.2	77.9	46.9	42.7
Kansas[a]	66.3	84.9	94.2	41.6	65.8
Kentucky	53.4	78.2	91.9	20.2	53.1
Louisiana[a]	49.3	65.6	74.9	29.0	36.8
Maine	66.7	98.7	96.2	29.5	69.6
Maryland	73.1	89.8	95.1	42.0	64.0
Massachusetts[a]	78.3	90.6	95.1	66.6	75.9
Michigan	73.2	92.3	96.0	27.0	75.1
Minnesota	78.1	93.1	93.4	51.6	68.5

State	All LTSS Users	Age 18–64		Age 65+	
		Without ID/DD	With ID/DD	Without ID/DD	With ID/DD
Mississippi	61.5	73.4	72.0	52.5	54.5
Missouri	44.0	41.9	82.7	39.3	32.2
Montana	59.0	83.0	88.8	37.7	42.2
Nebraska[a]	55.0	76.1	88.5	34.2	45.2
Nevada[a]	78.8	84.7	92.0	70.9	71.0
New Hampshire	73.3	94.4	97.6	39.3	64.4
New Jersey	66.8	75.7	88.2	58.1	60.6
New Mexico	89.6	96.6	95.0	74.6	80.0
New York	80.4	92.0	91.6	69.7	75.7
North Carolina[a]	69.7	85.2	80.8	55.1	55.4
North Dakota	52.1	78.5	74.4	31.8	28.9
Ohio	65.3	78.7	81.5	51.1	53.3
Oklahoma	63.2	75.5	78.5	52.0	59.6
Oregon	93.0	97.4	98.3	86.5	90.3
Pennsylvania	71.5	91.8	88.8	44.0	58.2
Rhode Island[a]	38.1	60.4	73.3	28.4	42.3
South Carolina	73.1	85.5	91.8	56.7	71.1
South Dakota	58.5	82.4	93.4	31.0	63.1
Tennessee[a]	75.5	93.0	86.8	40.5	57.9
Texas	73.7	84.1	84.2	64.5	48.5
Utah[a]	83.4	91.4	87.4	59.0	79.5
Vermont	82.2	95.4	98.8	64.5	78.4
Virginia	73.9	87.1	93.8	59.2	69.1
Washington	84.8	91.9	97.3	77.2	70.8
West Virginia[a]	71.2	90.5	87.6	44.4	50.0
Wisconsin	90.6	98.1	97.2	75.2	82.7
Wyoming	76.8	94.2	95.5	44.9	63.2

Source: RTI analysis of TAF RIF enrollment and claims data, 2016–2019.
Notes: [a]These states had at least 1 year in the study period that was omitted from analyses due to data quality concerns. See Appendix A for more details. [b]Florida was omitted from analyses, as two years had a high proportion of beneficiaries with LTSS use but no paid claims. See Appendix A for more information.

To assess the overall distribution of HCBS use as a share of LTSS use, we grouped states into 10 percentage point ranges. During the study period, three states had rebalancing ratios greater than 90% (AK, OR, WI), eight states had rebalancing ratios between 80.0%–89.9% (AR, CO, ID, NM, NY, UT, VT, WA), 16 states had rebalancing ratios between 70.0%–79.9% (DC, GA, HI, MD, MA, MI, MN, NV, NH, PA, SC, TN, TX, VA, WV, WY), 13 states had rebalancing ratios between 60.0%–69.9% (AZ, CA, CT, DE, IL, IA, KS, ME, MI, NJ, NC, OH, OK), seven states had rebalancing ranges between 50.0%-59.9% (AL, IN, KY, MT, NE, ND, SD) and three states had rebalancing ratios less than 50% (LA, MO, RI).

Rebalancing Variation by Age and ID/DD Diagnosis

Rebalancing ratios varied by age and ID/DD-related subpopulation, as shown in **Table 4-3**. Older adults (ages 65 and older) (regardless of whether they had an ID/DD diagnosis) were less rebalanced than younger adults (ages 18 through 64) (regardless of whether they had an ID/DD diagnosis). Among older adults, those with ID/DD had higher rebalancing ratios than those without ID/DD. Similarly, among younger adults, those with ID/DD had higher rebalancing ratios than those without ID/DD. Rebalancing ratios for our age and ID/DD-related subpopulations also varied by state.

Older Adults. During the study period, older adults without ID/DD had the lowest nationwide rebalancing ratio among all age and ID/DD-related subpopulations, using HCBS exclusively during 55.2% of all months in which they received any LTSS (**Table 4-3**). Older adults with ID/DD had a slightly higher nationwide rebalancing ratio, using HCBS exclusively during 61.4% of all months in which they received any LTSS.

State-specific rebalancing ratios varied for both older adult subpopulations.

- For older adults without ID/DD, Alaska (86.6%), Oregon (86.5%), Arkansas (77.5%), Wisconsin (82.7%), and Colorado (82.3%) had the highest rebalancing ratios, while Kentucky (20.2%), California (26.6%), Michigan (27.0%), Alabama (27.7%), and Rhode Island (28.4%) had the lowest.
- For older adults with ID/DD, Alaska (90.4%), Oregon (90.3%), Arkansas (82.9%), Wisconsin (82.7%), and Colorado (82.3%) had the highest rebalancing ratios, while North Dakota (28.9%), Missouri (32.2%), Louisiana (36.8%), Alabama (40.4%) and Montana (42.2%) had the lowest.
- Nevada and North Carolina had the smallest gaps in rebalancing ratios between older adults with and without ID/DD, with differences less than 0.5 percentage points. Michigan and Maine had the largest gaps between younger adults with and without ID/DD, with differences exceeding 40 percentage points (**Table 4-3**).

Younger Adults. Nationwide, younger adults with ID/DD had the had highest rebalancing ratio among age and ID/DD-related subpopulations, although the difference between rebalancing ratios for younger adults with and without ID/DD was small (**Table 4-3**). The rebalancing ratio for younger adults with ID/DD was approximately 2.1 percentage points lower than that of their non-IDD/DD counterparts during the study period, with younger adults using HCBS exclusively during 88.9% of all months during which they received any LTSS and younger adults without ID/DD using HCBS exclusively during 86.8% of months during which they received any LTSS.

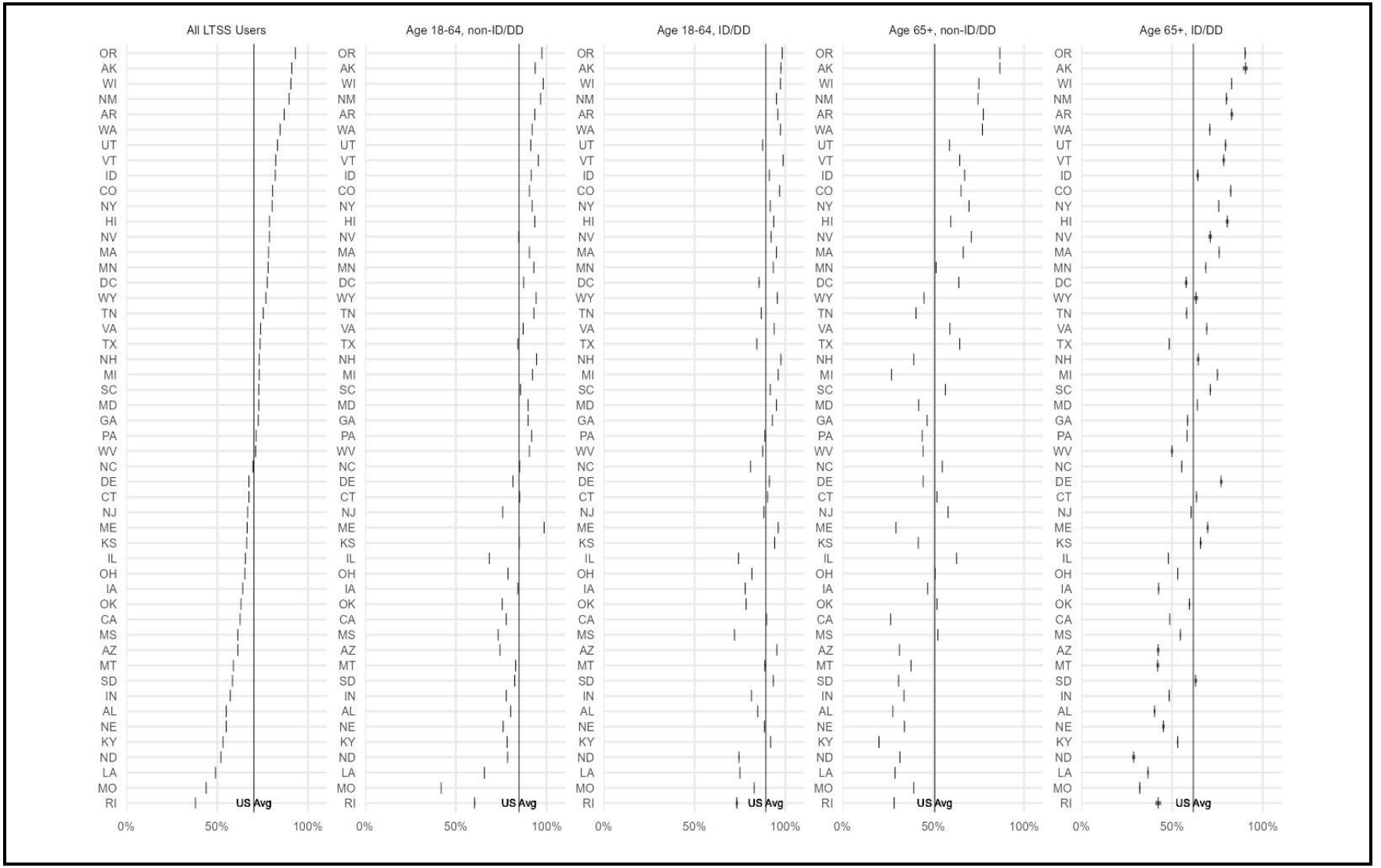
State-specific rebalancing ratios also varied for both younger adult subpopulations.

- For younger adults with ID/DD, Vermont (98.8%), Oregon (98.3%), Alaska (97.6%), New Hampshire (97.6%), and Washington (97.3%) had the highest rebalancing ratios, while Mississippi (72.0%), Rhode Island (73.3%), Illinois (74.2%), North Dakota (74.4%), and Louisiana (74.8%) had the lowest rebalancing ratios (**Table 4-3**).

- For younger adults without ID/DD, Maine (98.7%), Wisconsin (98.1%), Oregon (97.4%), New Mexico (96.6%), and Vermont (95.4%) had the highest rebalancing ratios, while Missouri (41.9%), Rhode Island (60.4%), Louisiana (65.6%), Illinois (68.5%), and Mississippi (73.5%) had the lowest rebalancing ratios.
- Differences in rebalancing between these younger adult subpopulations was smallest in Hawaii, Idaho, Minnesota, New York, Texas, and Wisconsin, where differences were less than 0.5 percentage points. Arizona, Kentucky, Missouri, Nebraska, New Jersey, and Rhode Island had the largest gaps in rebalancing ratios between younger adults with and without ID/DD, with differences ranging from 12.4 percentage points in Nebraska to 20.8 percentage points in Arizona.

Figure 4-1 shows the same information as **Table 4-3** but in graphical form. State-level rebalancing ratios for all LTSS users, as is shown in the far-left column, show a smooth trend. However, that smooth trend line does not hold when disaggregating rebalancing ratios by the four age and ID/DD-related subpopulations.

Figure 4-1. Rebalancing Ratio by State and Age and ID/DD-Related Subpopulation, 2016–2019

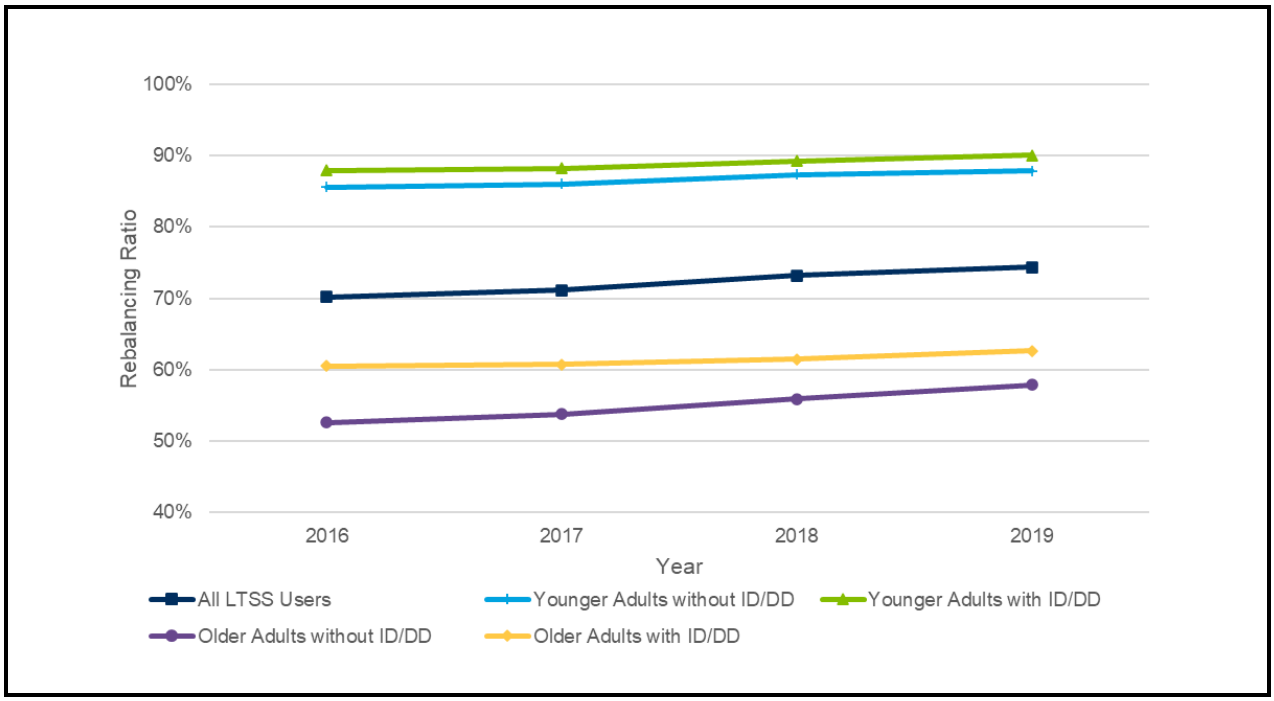


Source: RTI analysis of TAF RIF enrollment and claims data, 2016–2019.

The state ranking order for older adults, both with and without ID/DD, varies more widely from the overall ratio than the state ranking order for younger adults. Additionally, older adults have a much wider dispersion around the national mean than younger adults; Missouri's rebalancing ratio for younger adults without ID/DD is a notable exception. Older adults with ID/DD also have the greatest variability across states, shown by the wider horizontal bars in states like Rhode Island and Alaska.

Figure 4-2 shows annual rebalancing ratios for all LTSS users and by age and ID/DD-related subpopulations over the study period. National rebalancing ratios for younger adults without ID/DD, younger adults with ID/DD, and older adults with ID/DD all increased by 2 percentage points between 2016 and 2019. The rebalancing ratio for older adults without ID/DD increased the most, by 5 percentage points, during that time.

Figure 4-2. Annual National Rebalancing Ratio by Age and ID/DD-Related Subpopulation, 2016–2019



Source: RTI analysis of TAF RIF enrollment and claims data, 2016–2019.

Table 4-4 shows the states with rebalancing ratios in the top 25th percentile, overall and by the four age and ID/DD-related subpopulations. Five states (Alaska, Arkansas, Oregon, Vermont, and Wisconsin) had rebalancing ratios in the top 25th percentile for all LTSS users and for all four subpopulations.

Select states had high rebalancing ratios for certain subpopulations, but not others. Arizona, Maryland, Maine, Minnesota, New Hampshire, and Tennessee all had rebalancing ratios in the top 25th percentile for younger adults; however, these states did not have similarly high ratios for older adults. Conversely, several states, including Delaware, New Mexico, Nevada, New

York, Texas, and Utah, had high rebalancing ratios only among their older adult subpopulations. There was no clear pattern of high rebalancing by ID/DD subpopulation.

Table 4-2. Top 25th Percentile of Rebalancing Ratio by State and Age and ID/DD-Related Subpopulation, 2016–2019

		Age 18–64		Age 65+	
State	All LTSS Users	Without ID/DD	With ID/DD	Without ID/DD	With ID/DD
75% percentile cutoff	78.8	92.3	95.1	64.5	75.1
Alaska	●	●	●	●	●
Arkansas[a]	●	●	●	●	●
Arizona			●		
Colorado[a]	●		●	●	●
Delaware					●
Hawaii	●	●			●
Idaho	●			●	
Massachusetts[a]			●	●	●
Maryland			●		
Maine		●	●		
Michigan		●	●		●
Minnesota		●			
New Hampshire		●	●		
New Mexico	●	●		●	●
Nevada[a]	●			●	
New York	●			●	●
Oregon	●	●	●	●	●
Tennessee[a]		●			
Texas				●	
Utah[a]	●				●
Vermont	●	●	●	●	●
Washington	●		●	●	
Wisconsin	●	●	●	●	●
Wyoming		●	●		

Source: RTI analysis of TAF RIF enrollment and claims data, 2016–2019.
Notes: [a]These states had at least one year in the study period that was omitted from analyses because of data quality concerns. See Appendix A for more details. [b]Florida was omitted from analyses, as two years had a high proportion of enrollees with LTSS use but no paid claims. See Appendix A for more information.

Rebalancing Variation by Demographic Characteristics

Rebalancing ratios also varied by other demographic characteristics, including sex, dual eligibility status, residence in a non-metropolitan area, and race and ethnicity (**Table 4-5**). The nationwide rebalancing ratio for female LTSS users was slightly lower than for all LTSS users at

71.3% and 72.4%, respectively. In California, Kentucky, Maine, Michigan, and South Dakota, rebalancing ratios were at least 5 percentage points lower for female LTSS users than the state average. However, in Nevada, Texas, and Utah, rebalancing ratios among female LTSS users were at least one percentage point higher than the state average.

Table 4-3. Rebalancing Ratio by Enrollee Demographic Characteristics, Nationally and by State, 2016–2019

State	All LTSS Users	Female	Full-Benefit Duals	Non-Metropolitan	Non-Hispanic			Hispanic
					White	Black	Asian	
United States	**72.4**	**71.3**	**64.2**	**68.4**	**68.2**	**78.2**	**85.0**	**85.1**
Alabama[a]	55.2	53.3	41.0	52.7	46.9	61.6	53.4	76.7
Alaska	91.1	91.0	89.7	82.7	90.8	91.4	98.1	96.6
Arizona[b]	61.4	58.6	49.6	48.0	—	—	—	—
Arkansas[b,c]	86.9	86.7	84.2	87.9	—	—	—	—
California[a]	62.8	57.1	50.1	64.9	60.4	65.1	57.5	73.1
Colorado[b,c]	80.6	79.3	75.2	77.7	—	—	—	—
Connecticut[b]	67.5	64.7	61.4	65.6	—	—	—	—
Delaware	67.6	64.0	61.2	N/A	61.9	76.7	81.5	73.4
District of Columbia[a,d]	77.7	80.2	71.0	N/A	57.2	79.4	77.5	96.8
Florida[e]	—	—	—	—	—	—	—	—
Georgia[a]	72.7	73.4	55.8	66.7	63.2	74.0	93.9	95.1
Hawaii[a]	78.9	75.6	72.4	75.1	85.4	95.1	74.7	82.6
Idaho[b]	82.2	81.7	77.4	76.7	—	—	—	—
Illinois	65.7	67.0	62.4	60.0	59.5	72.5	88.2	75.3
Indiana[b]	57.2	53.1	51.5	51.3	—	—	—	—
Iowa[b]	64.2	61.6	59.3	59.9	—	—	—	—
Kansas[b,c]	66.3	63.3	59.7	63.7	—	—	—	—
Kentucky[b]	53.4	46.7	43.1	52.8	—	—	—	—
Louisiana[b,c]	49.3	49.8	43.0	50.3	—	—	—	—
Maine	66.7	59.5	59.9	64.8	67.1	92.5	84.5	76.6
Maryland[e]	73.1	70.1	58.6	66.3	67.5	73.7	88.4	91.3
Massachusetts[b,c]	78.3	76.6	75.8	72.4	—	—	—	—
Michigan[b]	73.2	67.7	61.5	72.6	—	—	—	—
Minnesota	78.1	74.3	72.1	71.6	75.1	91.4	94.1	89.7
Mississippi[d]	61.5	62.2	60.5	62.4	49.2	70.1	51.6	44.0
Missouri[b]	44.0	43.7	41.2	47.2	—	—	—	—
Montana	59.0	58.6	51.2	54.8	60.1	83.9	61.6	71.8
Nebraska[c]	55.0	49.9	48.1	47.8	53.3	65.0	91.4	68.8
Nevada[c]	78.8	80.3	74.5	77.9	70.6	86.8	84.4	90.1
New Hampshire	73.3	69.1	59.7	72.5	73.4	90.7	92.5	89.4
New Jersey[a]	66.8	66.6	63.3	N/A	56.9	64.6	84.2	83.7

State	All LTSS Users	Female	Full-Benefit Duals	Non-Metropolitan	Non-Hispanic White	Non-Hispanic Black	Non-Hispanic Asian	Hispanic
New Mexico	89.6	89.7	82.5	87.8	86.7	91.4	94.9	91.9
New York	80.4	80.0	75.0	69.1	72.9	81.9	93.6	89.3
North Carolina[c]	69.7	69.5	63.8	71.5	60.7	78.6	86.9	78.0
North Dakota	52.1	47.4	47.0	44.0	49.4	88.0	92.6	79.0
Ohio[c]	65.3	64.1	61.1	62.4	—	—	—	—
Oklahoma	63.2	63.1	60.9	62.5	60.5	73.0	75.4	73.9
Oregon	93.0	93.3	89.1	93.0	91.9	93.8	98.0	98.7
Pennsylvania	71.5	69.5	56.1	69.5	64.2	84.7	93.3	90.1
Rhode Island[b,c]	38.1	38.1	32.4	N/A	—	—	—	—
South Carolina[a]	73.1	71.3	69.2	77.0	63.0	77.6	81.5	83.0
South Dakota	58.5	52.8	57.2	52.2	58.2	81.8	77.6	81.5
Tennessee[b,c]	75.5	76.0	56.5	72.4	—	—	—	—
Texas[a]	73.7	74.8	57.2	67.0	56.6	78.9	80.1	85.2
Utah[b,c]	83.4	85.1	71.9	78.7	—	—	—	—
Vermont[b]	82.2	79.4	75.1	81.5	—	—	—	—
Virginia	73.9	72.4	68.7	70.8	68.0	80.4	91.0	85.6
Washington	84.8	84.7	85.6	84.0	82.7	87.5	93.7	90.4
West Virginia[b,c]	71.2	69.3	61.1	72.4	—	—	—	—
Wisconsin[a]	90.6	89.9	85.5	88.5	87.4	96.6	98.5	96.5
Wyoming[a,d]	76.8	75.1	78.4	74.5	82.3	94.0	85.8	86.6

Source: RTI analysis of TAF RIF enrollment and claims data, 2016–2019.
Notes: [a]Stratifications by race and ethnicity may be biased, as over 10% of LTSS users had missing race/ethnicity data. [b]These states were omitted from stratifications by race and ethnicity because of data quality concerns. [c]These states had at least one year in the study period that was omitted from analyses because of data quality concerns. See Appendix A for more details. [d]Stratifications by race and ethnicity included 2017-2019; 2016 was omitted because of data quality concerns;. [e]Florida was omitted from analyses, as two years had a high proportion of enrollees with LTSS use but no paid claims. See Appendix A for more information.

Nationally, the rebalancing ratio for LTSS users who were dually eligible for Medicare and Medicaid was lower than the rebalancing ratio for all LTSS users, with a difference of 8.2 percentage points. In Georgia, Pennsylvania, and Texas the differences were much larger, with rebalancing ratios for dually eligible individuals at least 15 percentage points lower than for all LTSS users. In Washington and Wyoming, rebalancing ratios were slightly higher for dually eligible individuals, by 0.8 and 1.6 percentage points, respectively.

In many states, the quality and missingness of race and ethnicity data required omitting subpopulation-specific rebalancing estimates. However, among states with credible race and ethnicity data, Hispanic and Asian LTSS users had rebalancing ratios of approximately 85%, while non-Hispanic Black LTSS users had a rebalancing ratio of 78.2%, and non-Hispanic White LTSS users had a rebalancing ratio of 68.2%. Non-Hispanic White enrollees were the least rebalanced population in every state except California, Hawaii, and Mississippi. In California and

Hawaii, Asian LTSS users were the least rebalanced, while Hispanic LTSS users were least rebalanced in Mississippi.

Transitions Between HCBS Use and Institutional LTSS Use

A descriptive analysis used two metrics to measure transitions between use of institutional LTSS and HCBS: the percentage of months with only HCBS use where the enrollee had institutional LTSS use in the following month and the percentage of months with institutional LTSS use where the enrollee had only HCBS use in the following month. For LTSS users nationwide, among months with only HCBS use, 0.3% had institutional LTSS use in the following month (**Table B-4**), whereas 0.9% of months with institutional LTSS use had only HCBS use in the following month (**Table B-5**). Transitions from only HCBS use to institutional LTSS use were more prevalent among older adult LTSS users without (0.5%) or with (0.4%) an ID/DD diagnosis than among younger adult LTSS users without (0.3%) or with (0.1%) an ID/DD diagnosis (**Table B-4**). Conversely, transitions from institutional LTSS use to only HCBS use were more common among younger adult LTSS users with (1.1%) or without (2.2%) ID/DD diagnoses than among older adult LTSS users with (0.5%) or without (0.6%) an ID/DD diagnosis.

Correlations Between Rebalancing Ratios and State Factors

To assess potential relationships between state characteristics and rebalancing ratios, we conducted simple bivariate correlations, which are shown in **Table 4-6**. Correlation coefficients that are denoted with an asterisk indicate the relationship is significant at $p<0.05$.

HCBS Program Adoption. We found no significant associations between HCBS program adoption and overall or age and ID/DD-related subpopulation-specific rebalancing ratios. However, adoption of a 1915(k) state plan, self-directed personal care state plan coverage, coverage of private duty nursing, and personal care coverage all showed consistent, positive associations with rebalancing ratios for all LTSS users and subpopulations. These findings suggest that although the relationship is small, their presence may play a role in increasing use of HCBS.

Participation in Rebalancing-Related Initiatives. We found no significant associations between participation in rebalancing-related initiatives and overall LTSS user or subpopulation-specific rebalancing ratios. Coefficients were generally mixed, and no clear pattern was observed.

Other Relevant Medicaid Policies. There were no significant associations between other potentially rebalancing-relevant Medicaid policies and overall LTSS user rebalancing ratios. However, there was a significant correlation between a state's median SSI payment and rebalancing ratio for younger adults with ID/DD (0.30, $p<0.05$). This correlation suggests that higher SSI payments for younger adults with ID/DD may positively impact their use of HCBS. Notably, there is no statistically significant relationship between a state's average Medicaid spending per enrollee and the overall LTSS user or subpopulation-specific rebalancing ratios.

Table 4-4. Associations of States' Rebalancing Ratios with Medicaid Program and Policy Adoption and Other State Characteristics

	Pearson's Correlation Coefficient between States' Rebalancing Ratios and the Covariate				
		LTSS Users			
		Aged 18–64		Aged 65+	
Covariate	All LTSS Users	Without ID/DD	With ID/DD	Without ID/DD	With ID/DD
HCBS Program Adoption					
Adopted 1915(i) State Plan	0.02	−0.05	−0.19	0.05	−0.04
Adopted 1915(k) State Plan	0.14	0.12	0.16	0.16	0.04
Provided HCBS via 1115 Waiver	0.07	−0.01	0.09	0.08	0.07
Self-Directed Personal Care State Plan	0.25	0.11	0.26	0.24	0.23
Private Duty Nursing Coverage	0.12	0.13	0.15	0.15	0.14
Legally Responsible Adults as Paid Provider	0.12	0.02	0.07	0.1	0.12
ADRC No Wrong Door Score	0.01	−0.02	0.16	0.04	0.08
Personal Care Coverage	0.14	0.06	0.16	0.17	0.17
Participation in Rebalancing-Related Initiatives					
Balancing Incentive Program	−0.07	−0.13	−0.1	**0.05**	−0.09
Financial Alignment Initiative	0.05	−0.04	−0.01	0.12	0.08
Value-Based Payment IAP for HCBS	−0.18	−0.27	−0.17	−0.02	−0.18
Other Relevant Medicaid Policies					
Medicaid Expansion Status in 2019	0.08	0.12	0.15	0.06	0.13
Adult Monthly Medicaid Spending per Enrollee	−0.11	−0.09	−0.05	−0.09	−0.1
Percent of Beneficiaries with Managed Care	−0.17	−0.19	−0.11	−0.17	−0.13
Median SSI for People with Disabilities	0.18	0.08	0.30*	0.1	0.27
Income Limit for SSI Beneficiaries, Optional Pathway	−0.11	−0.14	−0.13	−0.12	−0.03
Population Characteristics					
Percent Dual-Eligible (Statewide)	−0.33*	−0.14	−0.2	−0.29*	−0.23
Median Frailty Score (LTSS Users)	−0.39**	−0.42**	−0.33*	−0.17	−0.29*
Percent Below Federal Poverty Limit (Statewide)	−0.18	−0.23	−0.34*	−0.11	−0.27
Percent Rural (LTSS Users)	−0.30*	−0.06	−0.15	−0.34*	−0.17

Covariate	Pearson's Correlation Coefficient between States' Rebalancing Ratios and the Covariate				
		LTSS Users			
		Aged 18–64		Aged 65+	
	All LTSS Users	Without ID/DD	With ID/DD	Without ID/DD	With ID/DD
Regional Price Parity (Statewide)	0.30*	0.19	0.32*	0.31*	0.34*
Health System Factors					
Assisted Living Units per 1k	0.15	0.22	0.25	0.09	0.11
Nursing Facility Beds per 1k	0.01	0.07	−0.02	0.01	0
Aides per 100 with a Disability	0.24	0.2	0.25	0.25	0.17
Hourly Wage for Personal Care Assistants	0.19	0.19	0.26	0.19	0.22

Source: RTI analysis of TAF RIF enrollment and claims data, 2016–2019.
Notes: * p < 0.05; ** p <0 .01

Population Characteristics. Factors associated with the composition of statewide or LTSS user populations were most likely to be associated with rebalancing. The percentage of a state's population that was dually eligible for Medicare and Medicaid, the median frailty score of LTSS users, and the percentage of a state's population residing in rural areas were negatively associated with the rebalancing ratio; as the proportion of LTSS users who were dually eligible for Medicare and Medicaid or lived in rural areas increased, or as the median frailty score increased, there was a statistically significant decrease in HCBS use as a share of total LTSS use. These trends hold across the overall LTSS user population and all subpopulations, although significance varies by subpopulation. This finding shows a strong relationship between a state's LTSS population characteristics and use of HCBS as a share of LTSS use; states with Medicaid LTSS users who are sicker, older, and more rural have lower overall and subpopulation-specific rebalancing ratios.

Two additional factors were assessed on the statewide level, the percentage of a state population living below the federal poverty level and regional price parity. Though significance is variable, there is an indirect relationship between poverty and rebalancing: states that have higher proportions of residents living below the federal poverty level also have lower rebalancing ratios. Because the federal poverty level is uniform across the country, we also incorporated regional price parity to account for the continuum of cost of living. There is a very strong association between regional price parity and rebalancing, suggesting increased cost of living is associated with greater use of HCBS as a share of total LTSS use.

Health System Characteristics. We did not find any statistically significant relationships between health system characteristics assessed and rebalancing ratios. However, we did

observe non-significant trends that suggest states with higher hourly wages for personal care workers and higher densities of assisted living units and personal care aides may have higher rebalancing ratios.

4.1.2 Multivariate Meta-Regression Analyses

In addition to simple pairwise correlations, we ran a two-stage meta-regression model as described in **Section 3**. The meta-regression results shown below in **Table 4-7** show the relationship between Medicaid programmatic and policy factors, population characteristics, and health system factors and overall state rebalancing ratios, after controlling for state-specific population characteristics and the relationship between independent factors. Factors that result in statistically significant associations with rebalancing at $p<0.05$ are denoted in the table with an asterisk.

Table 4-5. National Meta-Regression Results, 2016–2019

Attribute	Coefficient	Statistical Significance
HCBS Program Adoption		
Adopted 1915(i) State Plan	5.45	
Adopted 1915(k) State Plan	−16.12	*
Provided HCBS via 1115 Waiver	−7.11	
Self-Directed Personal Care State Plan	13.38	**
Private Duty Nursing Coverage	4.55	
Legally Responsible Adults as Paid Provider	−14.57	*
ADRC No Wrong Door Score	0.00	
Personal Care Coverage	−3.06	
Participation in Rebalancing-Related Initiatives		
Balancing Incentive Program	−6.77	
Financial Alignment Initiative	−7.73	
Value-Based Payment IAP for HCBS	1.05	
Other Relevant Medicaid Policies		
Medicaid Expansion Status in 2019	−1.69	
Adult Medicaid Spending PMPM	−0.02	
Percent of All Expenditures Paid by Managed Care	−0.14	
Median SSI for People with Disabilities	−0.07	
Income Limit for SSI Beneficiaries, Optional	−0.03	*
Population Characteristics		
Percent Dual-Eligible (LTSS Users)	−0.82	
Median Frailty Score (LTSS Users)	−347.34	**

Percent Below FPL (Statewide)	1.21	
Percent Rural (Statewide)	−0.08	
Regional Price Parity (Statewide)	1.66	*
Health System Factors		
Assisted Living Units per 1k	0.11	
Nursing Facility Beds per 1k	−14.15	
Aides per 100 with a disability	0.38	
Hourly Wage for Personal Care Assistants	−.32	

Source: RTI analysis of TAF RIF enrollment and claims data, 2016–2019.
Notes: * p < 0.05; ** p <0 .01; *** p < 0.001.

HCBS Program Adoption

After controlling for person-level characteristics among LTSS users within each state, state adoption of HCBS policies had mixed effects on overall rebalancing. **Table 4-7** shows that states that adopted a state plan for self-directed personal care services had overall rebalancing ratios 13.4 percentage points higher than states without the state plan self-directed personal care services.

The adoption of a 1915(k) Community First Choice state plan option and allowing legally responsible adults to act as paid providers are associated with significantly lower rebalancing ratios. After controlling for state population characteristics and other policies in the model (**Table 4-7** covariates), the adoption of a 1915(k) state plan option was significantly associated with an overall rebalancing ratio 16.1 percentage points lower than non-adopting states. Similarly, states that enacted policies allowing legally responsible adults to act as paid providers had overall rebalancing ratios 14.6 percentage points lower than states without this policy.

After controlling for person-level and other state-specific factors, there was no statistically significant relationship between a state's rebalancing ratio and state adoption of a 1915(i) state plan option, provision of HCBS through an 1115 demonstration, coverage of private duty nursing, No Wrong Door score, or adoption of a state plan for personal care coverage.

Participation in Rebalancing-Related Initiatives

After controlling for person-level and other characteristics, participation in CMS's Balancing Incentive Program, the Financial Alignment Initiative, or the Medicaid Innovation Accelerator Program's HCBS demonstration was not significantly associated with state rebalancing ratios.

Other Relevant Medicaid Policies

We found most other potentially rebalancing-relevant Medicaid policies had little impact on rebalancing, after controlling for other person- and state-level characteristics. There was a slight inverse relationship between higher income limits for optional SSI programs, however the effect was small at −0.03 percentage points less per dollar increase to the income limit. There was no clear association between Medicaid expansion status, average spending per adult Medicaid

enrollee, proportion of a state Medicaid program being paid through managed care arrangements, or median SSI benefit amount and state rebalancing ratios.

Population Characteristics

As with the bivariate correlations, median frailty score and regional price parity were both associated with the overall rebalancing ratios across all states. As the median frailty index in a state increased, rebalancing ratios decreased ($p<0.05$). As regional price parity increased, rebalancing ratios also increased ($p<0.05$). Both of these standardized measures use a unique unit of analysis and scaling that make it difficult to interpret a direct quantifiable effect size on the rebalancing ratio. Rather than lose variation through reclassification or transformation, we maintained the original scaling and interpret the findings primarily based on their directionality.

After controlling for person-level characteristics and other factors, there was no association between the percentage of a state's LTSS population who were dually eligible for Medicaid and Medicare or the percentage of a state living below the federal poverty level.

Health System Characteristics

Statewide health system characteristics were not associated with rebalancing after accounting for other individual- and policy-level factors. There was no significant association between the ratio of assisted living beds, nursing facility beds, or personal care aides to relevant population and statewide rebalancing ratios. There was also no significant association between average hourly wage for personal care workers and state rebalancing ratio.

5. Discussion and Conclusion

This study used person-level Medicaid claims data to examine patterns of Medicaid LTSS rebalancing nationally and by state. During the study years (2016–2019), among approximately eight million Medicaid enrollees who used LTSS across the United States, HCBS was used exclusively (without any institutional LTSS use) during 72.4% of enrollee months with any LTSS use. Use of HCBS, as a share of total LTSS use, varied by state, ranging from 38.1% (Rhode Island) to 93.0% (Oregon). All but three states included in our study had rebalancing ratios of 50% or higher.

5.1 Older Adult Medicaid Enrollees Had Lower Rebalancing Ratios than Younger Adults

After controlling for person-level demographics and select health characteristics, including frailty, older adults had the lowest rebalancing ratios nationally and across nearly all states. Notably, we found larger differences in rebalancing between older adults and younger adults than differences within age categories by ID/DD status. Nationwide, the rebalancing ratio for younger adults without ID/DD was 32 percentage points higher than the rebalancing ratio for older adults without ID/DD. Similarly, the national rebalancing ratio for younger adults with ID/DD was 28 percentage points higher than the rebalancing ratio for older adults with ID/DD. Among older adults, the difference in rebalancing ratios between those with and without ID/DD was six percentage points. Among younger adults, the difference in rebalancing ratios between those with and without ID/DD was only two percentage points.

Due, in part, to the differences in rebalancing between older and younger adults, overall state rebalancing ratios were related to the size of a state's population of older adult LTSS users. Between 2016 and 2019, nationwide, older adults made up approximately 40% of all LTSS users, while younger adults made up approximately 60%. Oregon and Wisconsin, for example, had lower proportions of older adult LTSS users (24% and 27%, respectively) and were among the states with the highest overall rebalancing ratios (93.0% and 90.6%, respectively) (**Table 4-3**). Similarly, among the three states with rebalancing ratios less than 50% (RI, MO, LA), all have significantly larger populations of older adults using LTSS (69%, 52%, and 48%, respectively) (**Table 4-3**). Frailty may serve as a proxy for eligibility requirements because states with significantly more frail populations may have stricter eligibility and enrollment requirements.

Despite lower rebalancing among older adults nationwide, several states achieved high degrees of rebalancing among older adult populations, with Alaska, Oregon, and Arkansas having the highest ratios. These states have undertaken various policy reforms and operate in vastly different state and health system contexts, yet achieved similar results. All three states expanded Medicaid, covered self-directed personal care services via a 1915(j) or state plan, and covered personal care services. However, each state also had unique contextual factors,

such as Arkansas' adoption of a 1915(i) state plan option and Oregon's adoption of a 1915(k) state plan option. Arkansas participated in the Balancing Incentive Program, but none of the states participated in the CMS's Value-Based Payment IAP for HCBS or Financial Alignment Initiative. Arkansas's LTSS population was significantly more frail, likely to be dually eligible for Medicare and Medicaid, and live in poverty than the LTSS populations in Oregon and Arkansas. Oregon's score on the Aging and Disability Resource Center's No Wrong Door metric was significantly higher than Arkansas's and Alaska's scores.

Among the 10 states with the highest rebalancing ratio for older adults, only one programmatic or policy condition was present in every state: coverage of personal care services. However, seven of the ten states with the lowest rebalancing ratios for older adults also cover personal care services. Across the Medicaid programs and policies analyzed in this study, no program or policy was quantitatively associated with rebalancing among older adults, other subpopulations, or the LTSS population as a whole. Additional mixed-methodology research is necessary to understand how specific elements of policy and program implementation impact rebalancing efforts.

5.2 Rebalancing Differences Exist Across Sex, Race, and Ethnicity

Other sociodemographic groups also had differential rebalancing ratios, after accounting for other factors. Male enrollees had slightly higher rebalancing ratios than female enrollees, though differences were quite small. Among states with reliable race and ethnicity data, non-Hispanic White enrollees had the lowest rebalancing ratios, averaging 4.9 percentage points lower than the national rebalancing ratio average. Non-Hispanic Black, Hispanic, and Asian populations all had higher rebalancing ratios than the non-Hispanic White population. These trends held true across every state we analyzed, with two notable exceptions. In Hawaii, Asian and Hispanic enrollees had lower rebalancing ratios than non-Hispanic White and non-Hispanic Black enrollees. In Mississippi, the rebalancing ratio for Hispanic enrollees was lower than the ratio for non-Hispanic White enrollees. These differences among racial and ethnic groups may reflect variations in familial and community caregiving practices and experiences,[19, 20] individual preferences toward HCBS,[21] or availability of institutional LTSS.[22] Evidence shows that the population of LTSS users is increasingly diversifying with each passing year and initiatives to expand and diversify the workforce[23] are not adequately keeping up with enrollee needs.[24] Although our findings suggest higher rebalancing among non-Hispanic Black, Hispanic, and Asian groups, future qualitative studies should continue to assess how evidence of underlying structural discrimination may exacerbates unmet need for accessible, high quality, and culturally appropriate care[25, 26] in communities of LTSS users.

5.3 Reliable Data is Imperative to Addressing Disparities in LTSS

Administrative data, including both Medicaid claims and cost reports, cannot provide a comprehensive assessment of which LTSS users should be exclusively receiving their services in a home- or community-based setting. Factors such as severity of physical and cognitive impairments, availability of familial or community support, the presence of a personal care

workforce, and individual preference all influence the setting in which an individual receives LTSS. Our study underscores the importance of considering rebalancing across a continuum that does not presuppose an ideal rate of HCBS or institutional use, but rather considers the preferences and acuity of needs of individuals. Our findings provide state policymakers with subpopulation-specific rebalancing ratios that can be used to design more comprehensive strategies that consider the effects of age, disability type, and other sociodemographic characteristics.

5.4 State Programmatic and Policy Factors Have Variable Influence on Rebalancing

We found that most state-level LTSS and Medicaid coverage policies believed by stakeholders to be related with rebalancing were not associated with the outcome, after accounting for person-level characteristics. However, in regression-adjusted models, state adoption of a self-directed personal care state plan was positively associated with rebalancing, while state adoption of any 1915(k) Community First Choice state plan option and state use of the state plan option allowing legally responsible adults to serve as HCBS providers were negatively associated with rebalancing.

State participation in several prominent CMS initiatives designed to support rebalancing showed no significant association in state rebalancing. However, it is important to note that programs like the Balancing Incentive Program, the Financial Alignment Initiative, and the IAP for HCBS were not implemented with the totality of a state's LTSS users in mind. In each program, states were allowed to tailor their program to meet specific population needs, for example, the Financial Alignment Initiative's focus on dually eligible LTSS users. It is not unexpected that in states where these programs were implemented in relatively small or niche populations that rebalancing ratios for states' entire LTSS user populations were not markedly impacted. It is important to note that state participation in demonstrations like these are not random. For the Balancing Incentive Program, state eligibility was tied to historically low rates of rebalancing and served as an opportunity to increase rebalancing rates among those states with the lowest rates. The Financial Alignment Initiative was a large-scale multi-payer demonstration that required significant state investments and transformation for adults with disabilities; states that participated were generally more advanced in their LTSS programs than non-participating states.

In a previous ASPE-funded report, researchers reported no association between personal care coverage, coverage for residential care, HCBS waiting lists, SSI supplemental payments, the ADRC functionality score, or home health wages on HCBS spending.[6] The study, however, did find significant positive associations between single-family price index, state taxable resources, and availability of personal care aides, assisted living facilities, adult day services and self-directed services on state spending on HCBS. It is important to note that these differences may be reflective of the evolution of the LTSS landscape that warranted significant changes to the sample, outcomes, analytic approach, data sources, and selected relevant programmatic and policy factors. In particular, it is noteworthy to consider that the previous analysis utilized a

dependent variable of FFS HCBS spending, derived from 2006-2009 MAX Medicaid enrollment and claims files within a subset of states and only among full-benefit enrollees participating in FFS Medicaid. In this analysis, we examined rebalancing based directly upon enrollee utilization of HCBS and institutional LTSS in all states among LTSS users, regardless of payment arrangement.

Despite the limited statistical relationships we identified, the value of these programs should not be dismissed, but rather more closely examined through qualitative or implementation science methods. Our analyses sought to determine which macro factors impact overall trends in rebalancing across states and the United States, but offer little insight into how individual LTSS users engage with their health system to obtain services. Federal statutes that continue to favor institutional care, limited state support and HCBS expertise, nursing facility industry influence on state LTSS policy, lack of affordable and accessible housing, and LTSS workforce challenges are barriers to HCBS.[27] Additional research in this area should focus on determining subpopulation-specific preferences for LTSS delivery, investigate how individual states implement common LTSS-related Medicaid programs and policies, and assess how implementation variations impacts enrollee utilization of services.

5.5 Comparing Current Results with Other Research

Our findings share some similarities to previous research funded by ASPE. **Table 5-1** compared 2009 and 2019 rebalancing ratio research conducted in partnership with ASPE. Four of the 10 states with the highest use-based rebalancing ratios in 2019 (Alaska, Washington, Idaho, and Vermont) also were among the states with the highest use-based rebalancing ratios in 2009.

Table 5-1. Comparing National and State Rebalancing Ratios with Previous ASPE Research on Rebalancing

Rank	State	Rebalancing Ratio (2019)	State	Previous ASPE Rebalancing Ratio (2009)
--	United States	74	United States[a]	67
1	Oregon	94	Alaska[b]	90
2	Wisconsin	92	California	85
3	Alaska[b]	91	Washington[b]	82
4	Arkansas	90	Idaho[b]	80
5	New Mexico	90	Iowa	75
6	Washington[b]	86	North Carolina	74
7	New York	84	Vermont[b]	74
8	Idaho[b]	84	Colorado	73
9	Utah	83	Virginia	73
10	Vermont[b]	83	Missouri	70

Sources: RTI analysis of TAF RIF enrollment and claims data, 2016-2019 and Interstate Variation and Progress Towards Rebalancing for Long-Term Services and Supports in 2009, Table II.2.[6]

Notes: [a]Analysis of MAX claims for a subset of FFS Medicaid enrollees with full benefits from 37 states in 2009. Arizona, Hawaii, Maine, Massachusetts, Michigan, Minnesota, Montana, New Mexico, Oregon, Pennsylvania, Rhode Island, Tennessee, and Wisconsin were excluded from analysis. [b]Denotes state with rebalancing ratios among the 10 highest in both analyses.

In addition, when comparing our rebalancing ratios with spending-derived rebalancing ratios for the 2019, we found similarities. Five of the 10 states with the highest use-based rebalancing ratios in 2019 (Oregon, Wisconsin, New Mexico, Washington, and Vermont) also were among the most rebalanced states based on expenditure data, according to CMS' Medicaid LTSS Annual Expenditures Report for 2019.[4] Although the absolute value of our rebalancing ratio is higher than these expenditure-based estimates, it may provide a more accurate depiction of health care use and the degree to which a state's LTSS population is participating exclusively in HCBS (**Table 5-2**).

Table 5-2. Comparing National and State Rebalancing Ratios with LTSS Expenditures Report Rebalancing Rates (2019)

Rank	State	Rebalancing Ratio (2019)	State	LTSS Expenditure Report Rebalancing Rate (2019)
--	United States	74	United States[a]	59
1	Oregon[b]	94	Oregon[b]	83
2	Wisconsin[b]	92	Minnesota	77
3	Alaska	91	New Mexico[b]	76
4	Arkansas	90	Arizona	75
5	New Mexico[b]	90	Wisconsin[b]	75
6	Washington[b]	86	Washington[b]	73
7	New York	84	Massachusetts	72
8	Idaho	84	Kansas	72
9	Utah	83	Colorado	72
10	Vermont[b]	83	Vermont[b]	68

Sources: Source: RTI analysis of TAF RIF enrollment and claims data, 2016–2019 and 2019 Medicaid Long-Term Services and Supports Annual Expenditures Report, figure IV.3.[4]
Notes: [a]Analysis of 2019 CMS-64 data, state-submitted MLTSS data, and MFP worksheets for proposed budgets. Excludes California, Delaware, Illinois, and Virginia because of missing expenditure data. [b]Denotes state with rebalancing among the 10 highest in both analyses.

A recently released report sponsored by CMS entitled *Trends in the Use of and Spending for Home and Community-Based Services as a Share of Total LTSS Use and Spending in Medicaid*, 2019–2021 provides additional insights into state progress towards rebalancing.[28]

5.6 Advancing and Expanding Evidence on Rebalancing

Historically, rebalancing has been assessed using cost report data, with an expectation that states should be spending more on HCBS than institutional LTSS. Although this metric has been helpful for assessing state progress toward enhancing HCBS, the metric does not directly

assess actual service rebalancing and cannot capture variations across certain subpopulations of LTSS users. We attempted to generate a similar metric of spending using claims payments among LTSS users; however, the increased uptake of managed care and other alternative payment models made it impossible to tie payments to specific services. With the rapidly expanding role of managed care in Medicaid, and particularly in LTSS, it is no longer feasible to isolate the direct cost of specific LTSS to a Medicaid program.

In this study, we show that a utilization-based rebalancing metric can assess the degree to which states provide HCBS in lieu of institutional LTSS, as appropriate. This metric can be generated for numerous subpopulations, including those with select health conditions, living in certain geographic regions, or enrolled in Medicare. Similarly, this metric uses a denominator that is limited to only those people receiving LTSS, thereby accurately reflecting the distribution of HCBS and institutional care utilization among the relevant population. To continue gaining insights into how Medicaid enrollees are receiving LTSS, states and the federal government should prioritize improved data quality, particularly related to quality and participation in HCBS waivers and state plans. Additionally, in 2022, CMS announced the introduction of the first standardized quality measure set for HCBS.[29] With the introduction of the new measure set, states received formal guidance and technical assistance to support best practice data collection, submission and analysis for a number of critical LTSS outcomes.[30] As data become available in the coming years, researchers should consider incorporating these measures into comprehensive rebalancing research.

A key consideration for this research, and all research related to rebalancing efforts, is that there is not an ideal ratio at which LTSS users should receive their care in home and community settings versus institutional settings. Although efforts are generally focused on increasing access to and utilization of adequate HCBS and avoiding unnecessary institutional stays, the degree to which a population is receiving care in the appropriate setting is highly dependent on their individual care needs, familial and community support systems, and personal preferences. This study showed high degrees of rebalancing variation across subpopulations, but additional research is needed to understand what factors contribute to these differences, including availability of service providers and how different groups of LTSS users make decisions regarding their care needs and care setting. In particular, additional research is needed to understand what factors account for differences in rebalancing by age, race, ethnicity, and gender. Additionally, more quantitative and qualitative research is needed to understand the individual, community, and health system factors that influence enrollee transitions between home and community-based care and institutional settings. Lastly, future rebalancing research should reconsider the role of statewide spending and instead place greater emphasis on enrollee access to care, service utilization, quality of care, and patient experience measures.

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Appendix A: Methodology

Data Sources

T-MSIS Research Identifiable Files

We used T-MSIS RIFs for years 2016 through 2019; RIFs contain all final action claims submitted to a state Medicaid agency who in turn submit them to CMS. For our analyses, we used data from the Demographic and Eligibility (DE) file, containing information on beneficiary characteristics, as well as Medicaid coverage details, the Inpatient (IP) claims file, which included details on all inpatient service utilization, the Other Services (OT) claims file, which included all outpatient and professional service utilization and costs, the Long-Term (LT) file, which provided information on nursing facility and other long-term care facility utilization and costs, and the Pharmacy (RX) file, which contained all prescription drug utilization and costs. The claims files (IP, OT, LT, and RX) include utilization and cost data for enrollees participating in both FFS and managed care plans.

DE File Data Quality

We examined Medicaid eligibility categories among LTSS users, finding that 80% of users were covered via the Aged, Blind and Disabled pathway. The adult and family eligibility pathway, which covers members of low-income families and enrollees with transitional medical assistance, represented most of the remaining 20% of users. We found significant variation in eligibility categories across states, but generally stable conditions for full-benefit coverage within states from 2016 through 2019; this finding suggests that, while states may have reframed their eligibility categories in accordance with state-specific policy revisions, including Medicaid expansion, LTSS users experienced minimal eligibility churn and gaps in coverage.

Sex data were uniformly consistent, with female enrollees comprising 60% to 61% of LTSS users. State variations in sex were largely driven by differences in eligibility for adults without eligible children; states with more expansive inclusion criteria for adults without children had higher rates of male enrollees.

Race and ethnicity data were not consistently available for all states. Within states that reported race and ethnicity of enrollees, estimates were generally stable. However, some states had consistent race and ethnicity that was incomparable to existing estimates from CMS or the American Community Survey. Approximately half of states were excluded from analysis involving race and ethnicity due to concerns with data quality. RTI utilized broad categorical race definitions as directly reported in claims as the study sample size could not support granular stratification without significant redaction.

LTSS users were grouped into three categories based on dual eligibility in Medicaid and Medicare: those who had full dual benefits at any point in the year, those who had partial dual benefits (i.e., who receive financial assistance for Medicare costs without full Medicaid benefits) at any point in the year, and those without Medicare benefits during the year. The majority of LTSS users had full dual benefits, and most states had stable data among LTSS users.

We evaluated the data quality of program participation among LTSS users for 1915(c) waivers, 1915(i) state plan options, 1915(j) state plan options, and 1915(k) state plan options. Although program availability varies by state, enrollment data substantially under-count participants compared to external benchmarks and, therefore, were deemed unreliable. This limitation was a key factor in the decision to define the sample based on LTSS use in claims and encounter records rather than eligibility for LTSS.

Service Utilization Data Quality

HCBS Utilization. We identified HCBS use by either the program that paid for the service (1915(c) waivers, 1915(j) state plan options, 1915(i) state plan options, and 1915(k) state plan options) or the service type. Most states had relatively stable HCBS utilization rates deemed acceptable for analysis.

We assessed a subset of HCBS service types, including personal care services, home health services, private duty nursing, and HCBS case management. Data on personal care service use were generally stable over time at 23%–25% among LTSS users. Home health service use data generally had relatively low within-state variation (37%–41%). Private duty nursing service use was mostly consistent around 1% for the states that submitted data on this service type. Thirty states had non-missing/non-suppressed private duty nursing data, and 19 of these had data with no or low concern. HCBS case management usage data were also generally consistent over time at 6%–9%. Thirty-one states had non-missing/non-suppressed HCBS case management data and twenty-four of these had data with no or low concern. Although most states were internally consistent in classification of HCBS service types, cross-state comparisons revealed wide variation in service classification. Given service type data limitations and stability in overall HCBS utilization was sufficient to analyze rebalancing trends, we did not compare use of granular HCBS service types across states in our analyses.

Institutional LTSS Utilization. Institutional LTSS use was identified through stays in nursing facilities (with stays of 90 days or longer), ICFs/IID, and certain mental health facilities. The quality of the institutional service use data was relatively consistent across years at 30%–33%.

Spending Data

We assessed FFS, managed care, and other types of supplemental spending in claims. Capitated spending tended to have more single-year concerns, while FFS spending tended to have data anomalies that extended for multiple years. Total spending for LTSS users was generally stable in most states, but less consistent than service use data over time. Despite relatively stable total spending for LTSS users, a cost-based rebalancing measure could not reliably be constructed as managed care payments could not be tied directly to service utilization, which is necessary to classify Medicaid spending as HCBS or institutional LTSS.

Table A-1 summarizes the data points omitted from statistical analyses due to quality concerns.

Table A-1. Years of State Data Excluded From Analyses Due to Quality Issues

State	Year(s)	Issue
Arkansas	2016	Unusually low numbers of enrollees with 1915(c) waiver and personal care data
Colorado	2017	Unusually high numbers of enrollees with HCBS use
Florida	2016, 2017, 2018, 2019	Unusually high numbers of enrollees with no positive payments
Kansas	2016	Unusually high numbers of enrollees with capitated payments and no positive payments
Louisiana	2016	Unusually high numbers of enrollees with "other HCBS" taxonomy code
Massachusetts	2016	Unusually low numbers of enrollees with home health and personal care
Nebraska	2016	No case management
Nevada	2016	Unusually low numbers of enrollees with personal care and 1915(j) state plans
North Carolina	2016	Almost all enrollees are marked as having 1915(c) waivers
Rhode Island	2018, 2019	Data quality issues identified through the TEP including incomplete submission of HCBS claims
Tennessee	2016	Unusually low numbers of home health enrollees
Utah	2016	Unusually high numbers of enrollees with case management
West Virginia	2017	Unusually low numbers of enrollees with home health use

Medicaid Programmatic and Policy, Population Characteristic, and Health System Data

To measure the effects of Medicaid programs and policy, population characteristics, and health system factors on LTSS utilization, we incorporated additional data on relevant state programs, policies and health system characteristics. **Table A-2** summarizes the state factors included in this analysis.

Study Population

First, we identified our study population of adult Medicaid enrollees who used LTSS between 2016 and 2019. Individuals were included in the study population if they used LTSS for at least one month in a given year of our study period. LTSS use was defined as either use of institutional LTSS, HCBS, or both.

Based on a preliminary data quality assessment, we determined that eligibility data from the DE file had several data quality issues. Several data elements, such as HCBS chronic condition indicators and 1915(c) waiver type codes, were not reported by most states. Other variables from the DE file, such as Money Follows the Person (MFP) enrollment and concurrent 1915(c)/MLTSS waiver participation, had substantially inflated enrollee counts for several states. Due to these limitations, we identified the study population based on whether an

individual had claims for LTSS in the LT and OT files. Information from the DE file were still used to characterize the study population.

Table A-2. Medicaid Program and Policy, Population Characteristic, and Health System Covariates

Variable	Source
HCBS Program Adoption	
Adopted 1915(i) State Plan: state adoption of any 1915(i) state plan, for any population, as of 2018	KFF, "Key State Policy Choices About Medicaid Home and Community-Based Services"[31]
Adopted 1915(k) State Plan: state adoption of any 1915(k) state plan, for any population, as of 2018	KFF, "Key State Policy Choices About Medicaid Home and Community-Based Services"[31]
Provided HCBS via 1115 Waiver: state adoption of any 1115 waiver which covers HCBS for any population, as of 2018	KFF, "Key State Policy Choices About Medicaid Home and Community-Based Services"[31]
Self-Directed Personal Care State Plan: state adoption of a self-directed personal care state plan, for any population, as of 2018	KFF, "Key State Policy Choices About Medicaid Home and Community-Based Services"[32]
Private Duty Nursing Coverage: whether state HCBS benefits cover private duty nursing, as of 2018	KFF, "Medicaid Benefits: Private Duty Nursing Services"[33]
Legally Responsible Adults as Paid Provider: whether state exercises state plan option allowing legally responsible adults to serve as HCBS provider, as of 2018	KFF, "Key State Policy Choices About Medicaid Home and Community-Based Services"[32]
ADRC No Wrong Door Score: state progress towards development of No Wrong Door (NWD) functions, as of 2019	AARP Foundation, Long-Term Services and Supports State Scorecard 2020 Edition[34]
Personal Care Coverage: whether state HCBS benefits cover personal care, as of 2018	KFF, "Medicaid Benefits: Personal Care Services"[33]
Participation in Rebalancing-Related Initiatives	
Balancing Incentive Program: state participation in the Balancing Incentive Program, as of 2017	ASPE, "Final Outcome Evaluation of the Balancing Incentive Program"[9]
Financial Alignment Initiative: state participation in the Financial Alignment Initiative, within 2016–2019	Centers for Medicare and Medicaid Services, "Financial Alignment Initiative for Medicare-Medicaid Beneficiaries"[35]
Value-Based Payment IAP for HCBS: state participation in the Innovation Accelerator Program – use of value-based payment for HCBS, within 2016-2019	Centers for Medicare and Medicaid Services, "Value-Based Payment for Home and Community-Based Services"[36]
Other Relevant Medicaid Policies	
Medicaid Expansion Status in 2019: Medicaid expansion status, as of 2019	KFF, "Status of State Medicaid Expansion Decisions: Interactive Map"[37]
Adult Medicaid Spending PMPM: average Medicaid spending per beneficiary per month, for 2016–2019	RTI analysis of T-MSIS files
Percent of Beneficiaries with Managed Care: percent of Medicaid beneficiaries with managed care out of total Medicaid beneficiaries, for 2016–2019	Center for Medicare and Medicaid Services, "Medicaid Managed Care Enrollment Report"[38]
Median SSI for People with Disabilities: median SSI payment for people with disabilities, averaged from 2016–2019	SSA, "Annual Statistical Supplement"[39]
Income Limit for SSI Beneficiaries, Optional Pathway: state monthly income eligibility threshold for SSI beneficiaries/optional pathway for seniors and people with disabilities up to 100% FPL, as of 2018	KFF, "State Variation in Medicaid LTSS Policy Choices and Implications for Upcoming Policy Debates"[40]

Population Characteristics	
Percent Dual-Eligible (Statewide): percent of Medicaid beneficiaries with full dual status out of total Medicaid beneficiaries, as of 2019	KFF, "Number of Dual-Eligible Individuals, Based on Medicaid Claims Data" and "Medicaid Beneficiaries by Enrollment Group"[41]
Median Frailty Score (LTSS Users): median frailty score among LTSS users, from 2016–2019	RTI analysis of T-MSIS files
Percent Below FPL (Statewide): percent of state population whose income is below 100% of the federal poverty line, as of 2018	RTI analysis of American Community Survey data
Percent Rural (LTSS Users): percent of LTSS users who live outside of metropolitan areas out of total LTSS users, from 2016–2019	RTI analysis of T-MSIS files
Regional Price Parity (Statewide): Relative difference between states in prices for goods, services, and rent, as of 2017	BEA, "GDP and Personal Income"[42]
Health System Factors	
Assisted Living Units per 1k: number of licensed assisted living and residential care units (excluding nursing facilities and units exclusively serving individuals with IDD) per 1,000 population over age 75, as of 2016	AARP Foundation, Long-Term Services and Supports State Scorecard 2020 Edition[43]
Nursing Facility Beds per 1k: number of certified NF beds in each state per 1,000 population over age 65, as of 2018	KFF, "Average Number of Certified Nursing Facility Beds"[44]
Aides per 100 with a Disability: number of personal care, nursing, psychiatric, and home health aide direct care workers in the workforce in each state per 100 population ages 18+ with an ADL, averaged across 2016-2018	AARP Foundation, Long-Term Services and Supports State Scorecard 2020 Edition[43]
Hourly Wage for Personal Care Assistants: average hourly wage for licensed personal care aides, as of 2018	BLS, "Occupational Employment and Wage Statistics"[45]

Institutional Use

The LT file has claims for LTSS provided in nursing facilities, ICFs/IID, and mental health facilities.

Medicaid enrollees met criteria for inclusion in the study population based on intuitional LTSS use if they had claims for specific facility-based services in the LT file during the study period, identified by the following values of the type of service code (TOS_CD):

- 009* - Nursing facility services for individuals aged 21 or older (other than services in an institution for mental disease)
- 047* - Nursing facility services, other than in institutions for mental diseases
- 059* - Skilled nursing facility services for individuals under age 21
- 046 - Intermediate care facility (ICF) / Intermediate care facilities for individuals with intellectual disabilities (ICFs/IID) / Individuals with intellectual disabilities (IID) services
- 044 - Inpatient hospital services for individuals aged 65 or older in institutions for mental diseases

- 045 - Nursing facility services for individuals aged 65 or older in institutions for mental diseases
- 048 - Inpatient psychiatric services for individuals under age 21

Claims with type of service codes for nursing facilities (marked with *) were only accepted as institutional LTSS if they were on a claim that was part of a nursing facility stay of 90 days or longer. We considered a stay to be a series of claims with overlapping values of ADMSN_DT/SRVC_BGN_DT and DSCHRG_DT/SRVC_END_DT or values of these variables that were within one day of each other.

HCBS Use

Medicaid enrollees met criteria for inclusion in the study population based on HCBS use if they had at least one OT claim during the study period paid for by a HCBS waiver or state plan option, or if an enrollee received one or more of the following during the study period: HCBS case management services, personal care services, home health services, or private duty nursing services (with place of service exclusions).

HCBS waivers and state plan options were identified using PGM_TYPE_CD or, if that variable was missing, a combination of WVR_TYPE_CD, BNFT_TYPE_CD, and HCBS_SRVC_CD using the following values in **Table A-3**.

For Medicaid enrollees who did not have claims which had been paid for by a HCBS waiver or state plan option, claims were examined hierarchically for the presence of codes for specific types of HCBS mentioned above based on the variables LINE_PRCDR_CD, TOS_CD, and BNFT_TYPE_CD, using the values in **Table A-4**.

Additional Inclusion Criteria

Once we identified LTSS users based on the criteria described above, we removed Medicaid enrollees who lacked positive payments in any of their claims—on average, this removed around 34,161 enrollees each year. For the remaining Medicaid enrollees, we applied additional criteria to only include adults that were currently enrolled in Medicaid. Specifically, individuals had to be enrolled in Medicaid (MDCD_ENRLMT_DAYS > 0) and over the age of 17 (calculated using BIRTH_DT) in a given month for that month's data to be included in study outcomes. Months where LTSS users were not enrolled in Medicaid or under the age of 18 were excluded from all results. These and other variables used in our analysis are included in **Table A-5**.

Table A-3. Hierarchical Assignment of LTSS to HCBS Waivers or State Plan Options

Waiver or State Plan Option	Hierarchy Status	Variable	Value(s)	
1915(c)	Primary	PGM_TYPE_CD	07	Home- and Community-Based Care Waiver Services (HCBS)
	If primary is missing	WVR_TYPE_CD	06	1915(c) – Aged and Disabled
			07	1915(c) – Aged
			08	1915(c) – Physical Disabilities
			09	1915(c) – Intellectual Disabilities
			10	1915(c) – Intellectual and Developmental Disabilities
			11	1915(c) – Brain Injury
			12	1915(c) – HIV/AIDS
			13	1915(c) – Technology Dependent or Medically Fragile
			14	1915(c) – Disabled (other)
			15	1915(c) – Enrolled in 1915(c) waiver for unspecified or unknown populations
			16	1915(c) – Autism/Autism Spectrum Disorder
			17	1915(c) – Developmental Disabilities
			18	1915(c) – Mental Illness – Age 18 or Older
			19	1915(c) – Mental Illness – Under Age 18
			20	1915(c) waiver concurrent with an 1115 or 1915(b) managed care authority
			33	1915(c) waiver
	If primary is missing	HCBS_SRVC_CD	4	HCBS service was provided under a 1915(c) HCBS Waiver
1915(i)	Primary	PGM_TYPE_CD	13	Home- and Community-Based Services (HCBS) State Plan Option (1915(i))
	If primary is missing	HCBS_SRVC_CD	1	HCBS service was provided under 1915(i)
1915(j)	Primary	PGM_TYPE_CD	16	1915(j) (Self-directed personal assistance services/personal care under State Plan or 1915(c) waiver)
	If primary is missing	BNFT_TYPE_CD	106	Self-directed Personal Assistance Services under 1915(j)
	If primary is missing	HCBS_SRVC_CD	2	HCBS service was provided under 1915(j)
1915(k)	Primary	PGM_TYPE_CD	11	Community First Choice (1915(k))
	If primary is missing	HCBS_SRVC_CD	3	HCBS service was provided under 1915(k)

Table A-4. Assignment of LTSS to HCBS Categories

Service	Conditions	Variable	Value(s)
Personal care	None	LINE_PRCDR_CD	99509 CPT code: personal care services (home visit for ADL or personal care)
			S5125 HCPCS code: attendant care services
			S5126 HCPCS code: attendant care services
			T1019 HCPCS code: personal care services
			T1020 HCPCS code: personal care services
Home health	No personal care	TOS_CD	016 Home health services — Nursing services
			017 Home health services — Home health aide services
			018 Home health services — Medical supplies, equipment, and appliances suitable for use in the home
			019 Home health services — Physical therapy provided by a home health agency or by a facility licensed by the State to provide medical rehabilitation services
			020 Home health services — Occupational therapy provided by a home health agency or by a facility licensed by the State to provide medical rehabilitation services
			021 Home health services — Speech pathology and audiology services provided by a home health agency or by a facility licensed by the State to provide medical rehabilitation services
			064 HCBS — Home health aide services
			079 HCBS-65-plus — Home health aide services
		BNFT_TYPE_CD	015 Home Health Services — Intermittent or part-time nursing services provided by a home health agency
			016 Home Health Services — Home Health Aide Services provided by a home health agency
			017 Home Health Services — Medical supplies, equipment, and appliances suitable for use in the home
			022 Home Health Services — Physical therapy; occupational therapy; speech pathology; audiology provided by a home health agency
			068 Home Health Services — Home health aide services provided by a home health agency
			076 Home Health Aide
HCBS case management	No personal care	TOS_CD	062 HCBS — Case management services
			077 HCBS-65-plus — Case management services
Private duty nursing services	No personal care; no excluded values of POS_CD	TOS_CD	022 Private duty nursing services
		BNFT_TYPE_CD	023 Private Duty Nursing
			069 Private duty nursing services
		POS_CD (excluded)	09 Prison/Correctional Facility
			21 Inpatient hospital
			31 Skilled Nursing Facility
			32 Nursing Facility
			33 Custodial Care Facility
			51 Inpatient Psych Facility
			54 Intermediate Care/Mentally Retarded Facility
			55 Residential Substance Abuse Treatment Facility
			56 Psychiatric Residential Treatment Center
			61 Comprehensive Outpatient Rehabilitation Facility

Table A-5. Key Covariates and Data Source

Variable Source	Variable Name	Description	Purpose
TAF Demographic and Eligibility (DE) file	BENE_ID	Enrollee identifier	Enrollee identifiers
	STATE_CD	Enrollee state	
	SEX_CD	Enrollee sex	Enrollee demographics
	RACE_ETHNCTY_CD	Enrollee race/ethnicity	
	BIRTH_DT	Enrollee birth date	Calculating enrollee age
	MDCD_ENRLMT_DAYS_01 – MDCD_ENRLMT_DAYS_12	Count of Enrollee Medicaid enrollment days in a month	Establishing Medicaid enrollment
	ELGBLTY_GRP_CD_01 – ELGBLTY_GRP_CD_12	Enrollee eligibility group code	Establishing medically needy status
	DUAL_ELGBL_CD_01 – DUAL_ELGBL_CD_12	Dual eligibility code	Establishing dual eligibility status
	BENE_CNTY_CD	County code	Establishing urbanicity
All TAF claims files (where present/applicable)	ADMSN_DT	Admission date	Attributing claims to months
	DSCHRG_DT	Discharge date	
	SRVC_BGN_DT	Service begin date	
	SRVC_END_DT	Service end date	
	CLM_TYPE_CD	Claim type code	Identifying FFS/capitated/other claims
	MDCD_PD_AMT	Claim paid amount	Identifying claim payment
	DGNS_CD_1 – DGNS_CD_12	Diagnosis code	Calculating frailty scores, identifying ID/DD and mental health status
	PRCDR_CD_1 – PRCDR_CD_6 (IP) / LINE_PRCDR_CD (OT)	Procedure code (CPT/HCPCS)	Calculating frailty scores, identifying HCBS
	TOS_CD	Type of service code	Identifying LTSS location and HCBS
TAF Other Services (OT) File only	POS_CD	Point of service code	Excluding HCBS provided outside the home
	PGM_TYPE_CD	Program type code	Identifying HCBS from claims
	WVR_TYPE_CD	Waiver type code	
	BNFT_TYPE_CD	Benefit type code	
	HCBS_SRVC_CD	HCBS service code	
	HCBS_TXNMY_CD	HCBS taxonomy code	

Intellectual and Developmental Disability Classification

We reviewed literature on classification of persons with intellectual and developmental disabilities from claims data. In partnership with ASPE, RTI utilized the following criteria as recommended in *Operationalizing the Definition of Intellectual and Developmental Disabilities in*

Administrative Claims Data for Research.[3] **Table A-6** describes the classification codes used to identify persons with intellectual and developmental disabilities.

Table A-6. Intellectual and Developmental Disability Classification Codes

Diagnosis Code Range	Description
Intellectual Disabilities	
E78.71-E78.2	Barth syndrome, Mixed hyperlipidemia
F70-F73	Mild to Profound Intellectual Disabilities
F78-F79	Other or Unspecified Intellectual Disabilities
Intellectual Disabilities - Related Conditions	
Q87.1, Q87.11, Q87.19, Q87.2, Q87.3, Q87.5, Q87.81, Q87.89	Other specified congenital malformation syndromes affecting multiple systems
Q89.7, Q89.8, Q90.0, Q90.1, Q90.2, Q90.9	Chromosomal abnormalities, not elsewhere classified or Down Syndrome
Q91.0, Q91.1, Q91.2, Q91.3, Q91.4, Q91.5, Q91.6, Q91.7	Trisomy 18 and Trisomy 13
Cerebral Degenerations Manifested in Childhood	
G31.81	Alpers disease
G80.0, G80.1, G80.2, G80.3, G80.4, G80.8, G80.9	Cerebral palsy
Pervasive and Specific Developmental Disorders	
F84.2	Rett's syndrome
F84.0, F84.3, F84.5	Phobic anxiety, Reaction to Severe Stress, or Somatoform disorder
F84.8, F84.9	Other pervasive DD, pervasive DD, unspecified
F88, F89	Other Developmental Delays
Congenital Malformations of the Nervous System	
Q87.89	Other specified congenital malformation syndromes, not elsewhere classified
Q89.7	Multiple congenital malformations, not elsewhere classified
Q89.8	Other specified congenital malformations
Other Congenital Malformations and Chromosomal Anomalies	
Q87.1	Aarrskog, Prader-Wille, de Lange, Seckel, etc.
Q87.11	Prader-Wille
Q87.19	Other congenital malformation syndromes predominantly associated with short stature

[3] This issue brief is available at https://aspe.hhs.gov/reports/definition-iddd-administrative-claims-data.

Diagnosis Code Range	Description
Q87.2	Congenital malformation syndromes predominantly involving limbs
Q87.23	Rubinstein-Taybi syndrome
Q87.3	Congenital malformation syndromes involving early overgrowth
Q87.81	Alport syndrome
Q85.1	Tuberous sclerosis
Q91.0-Q91.7	Trisomy 18 and Trisomy 13
Q92.0, Q92.1, Q92.2, Q92.5, Q92.61, Q92.62, Q92.7, Q92.8, Q92.9	Other trisomies and partial trisomies of autosomes, NEC
Q93.0, Q93.1, Q93.2, Q93.3, Q93.4, Q93.5, Q93.51, Q93.59, Q93.7, Q93.81, Q93.88, Q93.89, Q93.9	Monosomies and deletions from autosomes, NEC
Q95.2, Q95.3	Balanced sex/autosomal rearrangement
Q99.2	Fragile X chromosome
Q90.0, Q90.1, Q90.2, Q90.9	Down syndrome

Fetal alcohol syndrome	
P04.3	Newborn affected by maternal use of alcohol
Q86.0	Fetal alcohol syndrome (dysmorphic)

Claims-Based Frailty Index

We also looked at enrollees' levels of functional limitation in the form of frailty scores. After conducting a literature review of several different methods of measuring frailty, we elected to use the Claims-Based Frailty Index developed by Kim et. al. (2018).[16] We chose this index because it was validated in community-dwelling older adults, which was one of our primary populations of interest. We used the version of the index that was updated[46] for International Classification of Diseases, 10th revision (ICD-10) diagnosis codes to match our claims data's diagnosis format (they did not contain information on ICD-9 diagnoses, which the original index used).

The index works by linking ICD-10 diagnoses and CPT/HCPCS codes in claims to diseases or services indicative of frailty. For diseases, it uses 52 relevant diagnoses, including neurodegenerative diseases, cardio-metabolic diseases, and cerebrovascular diseases. Services are indicated by 25 Current Procedure Terminology (CPT) codes and 16 Healthcare Common Procedure Coding System (HCPCS) codes and include durable medical equipment. All relevant diseases and services are given a weight that is added up to a total frailty score between 0 and 1. A higher score indicates a higher degree of frailty—the official frailty cutoff score ranges from 0.10 to 0.25.

Descriptive Statistics

Once we identified the study population, we calculated several descriptive metrics of LTSS use. Specifically, we calculated measures of months of HCBS use, months of institutional LTSS use,

and HCBS use as a proportion of total LTSS use (i.e., rebalancing ratio). We also looked at transitions from use of only HCBS to use of only institutional LTSS and vice versa, defined as changes in service use from one month to the next. We calculated all measures nationally, by state, and by four main subpopulations of interest: Medicaid enrollees 65 and over with ID/DD, enrollees 65 and over without ID/DD, enrollees under 65 with ID/DD, and enrollees under 65 without ID/DD. Enrollees were identified as having ID/DD based on a set of ICD-10 diagnosis codes used by certain federal agencies (see **Table A-6**). Enrollees were given flags for ID/DD if they had one of these diagnoses at any point in the study period. In addition to these subpopulations, we calculated rebalancing ratios by sex, urbanicity, race, ethnicity, and dual status (i.e., being eligible for both Medicaid and Medicare), and Medicaid eligibility pathway. In addition, we produced frailty scores based on the frailty index described above.

Any HCBS Use

We defined HCBS use as whether an enrollee had any HCBS use in a month, regardless of whether they also had institutional LTSS use during that month. We operationalized a binary indicator measuring whether an enrollee had at least one claim in the OT file for any HCBS during a given calendar month, contingent upon concurrent Medicaid eligibility. Using this information, we calculated the percentage of months with at least one claim for any HCBS out of all months during which LTSS users were enrolled in Medicaid. We defined HCBS as all criteria for inclusion in the study population based on HCBS use mentioned above, as well as the set of values for benefit type code, type of service code, and HCBS taxonomy codes listed in **Table A-7**. These values are based on a combination of the service groups described in Rooney[17] and an internal review of the relevant variables that identified which values corresponded to services we knew to be HCBS-related. Private duty nursing and rehabilitation services were not counted as HCBS if the value of the place of service code on the claim was one of the excluded values listed in the sample inclusion criteria.

Any Institutional LTSS Use

We defined institutional LTSS use as whether an enrollee had an institutional stay regardless of whether they also had HCBS use during a given month of their institutional stay. We operationalized a binary institutional LTSS use indicator measuring whether an enrollee had any claim for stays in nursing facilities (of 90 days or longer), in ICFs/IID, and in mental health facilities in a given calendar month, contingent upon concurrent Medicaid eligibility. Using this information, we calculated the percentage of months with at least one claim for an institutional LTSS stay out of all months during which enrollees were enrolled in Medicaid. We defined institutional LTSS use using the same inclusion criteria for institutional LTSS use that we used for the study population.

Rebalancing Ratio

Historically, rebalancing has been primarily measured as the percentage of Medicaid spending on LTSS that went toward HCBS. However, this metric can only be used for a handful of states that exclusively use a FFS payment model. Therefore, we measured rebalancing using a utilization metric. Specifically, the rebalancing ratio is the ratio of months with only HCBS use to

months with any LTSS use (HCBS, institutional LTSS, or both). Any month that included claims for both HCBS and institutional LTSS was omitted from the numerator of this ratio.

Table A-7. HCBS Identifiers

Variable	HCBS Values			
BNFT_TYPE_CD	036	Other diagnostic, screening, preventive, and rehabilitative services — Rehabilitative Services	088	Environmental Modifications (Home Accessibility Adaptations)
	042	Case Management Services and TB related services — Case management services as defined in the State Plan in accordance with section 1905(a)(19) or 1915(g)	089	Vehicle Modifications
			090	Non-Medical Transportation
			091	Special Medical Equipment (minor assistive Devices)
			092	Home Delivered Meals
	045	Personal care services	093	Assistive Technology (i.e., communication devices)
	054	Community First Choice	094	Personal Emergency Response (PERS)
	072	Home and Community Care for Functionally Disabled Elderly individuals as defined and described in the State Plan	095	Nursing Services
			096	Community Transition Services
			097	Adult Foster Care
			098	Day Supports (non-habilitative)
	075	Homemaker	099	Supported Employment
	077	Adult Day Health services	100	Supported Living Arrangements
	078	Habilitation	101	Supports for Consumer Direction (Supports Facilitation)
	079	Habilitation: Residential Habilitation		
	080	Habilitation: Supported Employment	102	Participant Directed Goods and Services
	081	Habilitation: Education (non-IDEA available)	103	Senior Companion (Adult Companion Services)
	082	Habilitation: Day Habilitation		
	083	Habilitation: Pre-Vocational	104	Assisted Living
	084	Habilitation: Other Habilitative Services		
	085	Respite		
	086	Day Treatment (mental health service)		
	087	Psychosocial rehabilitation		
TOS_CD	043	Rehabilitation services	072	HCBS — Minor modification to the home
	053	Targeted case management services		
	063	HCBS — Homemaker services	073	HCBS — Other services requested by the agency and approved by CMS as cost effective and necessary to avoid institutionalization
	065	HCBS — Personal care services		
	066	HCBS — Adult day health services		
	067	HCBS — Habilitation services		
	068	HCBS — Respite care services	074	HCBS — Expanded habilitation services — Pre-vocational services
	069	HCBS — Day treatment or other partial hospitalization services, psychosocial rehabilitation services and clinic services (whether or not furnished in a facility) for individuals with chronic mental illness	075	HCBS — Expanded habilitation services — Educational services
			076	HCBS — Expanded habilitation services — Supported employment services, which facilitate paid employment
	070	HCBS — Day Care	078	HCBS-65-plus — Homemaker services
	071	HCBS — Training for family members	080	HCBS-65-plus — Personal care services
			081	HCBS-65-plus — Adult day health services
			082	HCBS-65-plus — Respite care services
			083	HCBS-65-plus — Other medical and social services
HCBS_TXNMY_CD	All non-missing values			

Total Medicaid Spending

Although we did not calculate a spending-based rebalancing measure, we did calculate total Medicaid spending for LTSS users by dual eligibility status, both nationally and by state. Total Medicaid spending was defined as the sum of spending (MDCD_PD_AMT) across three categories of Medicaid payments: FFS, managed care, and other. FFS spending included standard Medicaid and Medicaid expansion FFS spending, Children's Health Insurance Program (CHIP) FFS spending (which is minimal due to the LTSS user sample), and non-categorized FFS spending. Managed care spending included Medicaid capitated payments, CHIP capitated payments (with the same caveat mentioned above), and other capitated payments. Finally, other spending was comprised of supplemental payments from Medicaid claims, CHIP claims, and other claims. Total spending in each category is made up of the sum of FFS, managed care, and other spending. We did not use spending on encounter claims (payments from Medicaid managed care plans to providers) because their paid amounts are less reliable and would have been duplicative of capitated managed care spending (payments from state Medicaid agencies to Medicaid managed care plans). Categories of spending were identified in claims by claim type codes (CLM_TYPE_CD) using the categories in **Table A-8**.

Table A-8. Medicaid Claim Type Codes

Spending Type	CLM_TYPE_CD Values	
Fee-for-service	1	A Fee-For-Service (FFS) Medicaid or Medicaid expansion Claim
	A	Separate CHIP (Title XXI) claim: A Fee-for-Service (FFS) Claim
	U	Other FFS claim
Managed care	2	Medicaid or Medicaid expansion Capitated Payment
	B	Separate CHIP (Title XXI) claim: Capitated Payment
	V	Other Capitated Payment
Other	5	Medicaid or Medicaid expansion Supplemental Payment (above capitation fee or above negotiated rate) (e.g., FQHC additional reimbursement)
	E	Separate CHIP (Title XXI) claim for a supplemental payment (above capitation fee or above negotiated rate) (e.g., FQHC additional reimbursement)
	Y	Other Supplemental Payment

Once payments were totaled, we applied additional adjustments to address extreme values. If an enrollee's total payment for a given year was negative, we set their payment to 0. We also capped extreme positive values by setting them to the 99th percentile of all positive payments. Since we observed that the variable had a relatively exponential distribution, we used the log of the variable in our regression models (described below).

Transitions Analysis

We created two measures to determine the proportion of LTSS users transitioning from HCBS use to institutional LTSS use or vice versa. The institutional LTSS transition metric is calculated as the percentage of months with institutional LTSS use that had only HCBS use in the following month. The HCBS transition metric follows the same convention—it is defined as the

percentage of months with only HCBS use that had institutional LTSS use in the following month.

Correlations

We calculated Pearson[18] pairwise correlation coefficients with tests of statistical significance to assess unadjusted correlations between states' rebalancing ratios and state characteristics (such as Medicaid program and policy adoption, health system characteristics, and other state characteristics). The strength of these associations was estimated in the overall LTSS user population, as well as within the four age and ID/DD-related subpopulations. Unadjusted correlations contextualize meta-regression results that control for all state characteristics in the model by isolating the relationship between the rebalancing ratio and each state characteristic (**Table 4-6**).

Meta-regression Analysis

We used a two-stage multivariate meta-regression analysis to assess relationships between state-level Medicaid programmatic and policy characteristics, population characteristics, and health system factors and rebalancing ratios nationally. For the first stage of the analysis, we used generalized linear models to examine independent associations between LTSS users' characteristics and our main outcomes: rebalancing ratio, HCBS use, institutional LTSS use, and total Medicaid spending. In all these models, we used covariates for state, year, age, race and ethnicity, sex, dual eligibility status, presence of a mental health diagnosis, presence of an ID/DD diagnosis, urbanicity, proportion of an enrollee's payments that were capitated, use of 1915(c) waivers or 1915(i), 1915(j), or 1915(k) state plan options, medically needy status, frailty score, flags for the four age and ID/DD-related subpopulations, and flags for these subpopulations interacted with the state variable. We also included flags indicating when values were missing for the demographic variables and proportion of capitated payments. The models produced predicted values and standard errors for each state and subpopulation that we used as inputs to the second stage of our analysis. Each model provided five sets of estimates: an estimate for the population overall and one estimate for each of the four age and ID/DD-related subpopulations.

Several of the regressions in this first stage analysis had unique features. As mentioned above, the regression with total Medicaid spending as its dependent variable used a log-normal distribution to reduce skewness. The rebalancing ratio regression used a variable indicating HCBS use alone (i.e., without institutional LTSS use) for the dependent variable and was run only on enrollee months with LTSS service use. All regressions were run using SAS with the GLIMMIX procedure.

The second stage meta-regression model pooled mean predicted values and standard errors from the first stage models and included time-invariant programmatic, policy, population, and health system factors from each state as covariates. Using this meta-regression model, we assessed associations between these factors and rebalancing ratios. Due to heterogeneity in how states leverage their programs and policies across the four age and ID/DD-related

subpopulations of interest, the meta-regression model was only run on the state-level rebalancing ratios for the population of LTSS users overall. We used R version 4.4 and metafor[47] version 4.6 to run all meta-regressions.

Appendix B. Supplemental Tables and Figures

Table B-1. Percentage of Months with Co-Occurring HCBS and Institutional LTSS, 2016-2019

State	Percentage of LTSS Months with Both HCBS and Institutional LTSS
United States	3.8
Alaska	0.4
Alabama	3.8
Arkansas[a]	2.2
Arizona	0.3
California	7.1
Colorado[a]	4.7
Connecticut	1.5
District of Columbia	2.2
Delaware	1.5
Florida[b]	—
Georgia	23.8
Hawaii	0.4
Iowa	1.0
Idaho	1.0
Illinois	2.9
Indiana	1.4
Kansas[a]	2.0
Kentucky	0.1
Louisiana[a]	0.7
Massachusetts[a]	1.5
Maryland	1.4
Maine	0.3
Michigan	25.1
Minnesota	1.4
Missouri	0.1
Mississippi	1.5
Montana	0.5
North Carolina[a]	1.1
North Dakota	7.4
Nebraska[a]	44.3
New Hampshire	21.8
New Jersey	0.4
New Mexico	1.0
Nevada[a]	0.8
New York	3.0
Ohio	1.7
Oklahoma	5.1
Oregon	0.5
Pennsylvania	0.7
Rhode Island[a]	4.3
South Carolina	0.5
South Dakota	0.2
Tennessee[a]	5.9
Texas	2.6
Utah[a]	0.4
Virginia	16.6
Vermont	6.8
Washington	1.0
Wisconsin	3.9
West Virginia[a]	0.6
Wyoming	1.1

Source: RTI analysis of TAF RIF enrollment and claims data, 2016–2019.
Notes: [a] These states had at least one year in the study period that was omitted from analyses due to data quality issues. See Appendix A for more details. [b] Florida was omitted from analyses, as two years had a high proportion of enrollees with LTSS use but no paid claims. See Appendix A for more information.

Table B-2. Annual Rebalancing Ratios, 2016-2019

State	Percentage of LTSS Months with Only HCBS Use			
	2016	2017	2018	2019
United States	70.2	71.1	73.2	74.4
Alaska	91.6	91.0	91.0	91.0
Alabama	53.9	54.3	53.9	58.3
Arkansas	—	77.8	92.4	90.1
Arizona	58.4	59.6	61.6	65.5
California	59.5	61.6	64.4	65.0
Colorado[a]	78.2	—	81.2	81.9
Connecticut	66.6	67.5	67.6	68.5
District of Columbia	72.7	78.7	78.6	79.4
Delaware	61.6	66.8	69.2	71.0
Florida[b]	—	—	—	—
Georgia	68.4	73.1	74.2	74.3
Hawaii	76.2	80.8	79.5	78.6
Iowa	65.9	66.6	59.0	64.6
Idaho	81.9	81.2	82.0	83.5
Illinois	65.0	66.7	66.6	64.6
Indiana	54.8	56.3	57.7	59.8
Kansasa	-	66.3	66.2	66.6
Kentucky	52.9	52.5	53.2	54.8
Louisiana[a]	—	49.0	49.0	49.7
Massachusetts[a]	—	76.9	78.2	79.7
Maryland	64.0	66.7	77.9	78.2
Maine	65.3	66.2	67.0	68.2
Michigan	74.3	74.6	73.0	70.5
Minnesota	75.6	76.9	78.4	81.1
Missouri	42.5	43.4	44.6	45.3
Mississippi	62.1	60.4	60.8	62.5
Montana	57.0	57.3	57.5	63.5
North Carolina[a]	—	69.4	69.6	70.2
North Dakota	47.4	52.8	53.8	53.8
Nebraska[a]	—	53.7	54.6	56.7
New Hampshire	70.8	71.4	73.2	77.0
New Jersey	64.4	65.7	66.7	69.7
New Mexico	89.3	89.5	89.6	90.1
Nevada[a]	—	78.3	78.8	79.2
New York	75.1	77.9	82.4	84.1
Ohio	61.9	65.7	63.6	68.7
Oklahoma	63.3	63.2	63.0	63.3
Oregon	92.3	92.5	93.2	94.0
Pennsylvania	69.8	70.6	73.2	72.2
Rhode Island[a]	40.4	35.6	—	—
South Carolina	71.8	72.7	73.2	74.5
South Dakota	54.6	57.1	60.1	61.9
Tennessee[a]	—	74.9	75.7	76.1
Texas	72.5	73.1	74.0	75.0
Utah[a]	—	84.5	82.6	83.1
Virginia	72.5	72.5	74.8	75.4
Vermont	81.2	82.5	82.4	82.6
Washington	82.8	84.6	85.4	86.2
Wisconsin	91.4	88.2	90.2	92.3
West Virginia[a]	72.8	—	69.8	70.9
Wyoming	75.8	76.3	77.2	78.1

Source: RTI analysis of TAF RIF enrollment and claims data, 2016–2019.

Notes: [a] These states had at least one year in the study period that was omitted from analyses due to data quality issues. See Appendix A for more details. [b] Florida was omitted from analyses, as two years had a high proportion of enrollees with LTSS use but no paid claims. See Appendix A for more information.

Medicaid Spending Among LTSS Users

Table B-3. Medicaid Spending Among LTSS Users, by State and Dual Enrollment Status, 2016–2019

State	Rebalancing Ratio (%)	Total Medicaid Spending per Enrollee per Month ($)		
		Non-Duals	Partial Benefit Duals	Full Benefit Duals
United States	72.4	2,882	1,417	3,684
Alaska	55.2	7,619	169	6,016
Alabama	91.1	2,529	132	3,878
Arkansas[a]	61.4	2,909	602	2,470
Arizona	86.9	2,541	59	2,963
California	62.8	4,628	5,650	4,735
Colorado[a]	80.6	3,801	2,905	3,257
Connecticut	67.5	5,389	951	5,154
District of Columbia	67.6	5,036	552	6,231
Delaware	77.7	3,271	190	5,850
Florida[b]	—	--	—	--
Georgia	72.7	2,608	449	3,299
Hawaii	78.9	1,701	35	1,827
Iowa	82.2	3,350	104	3,601
Idaho	65.7	4,103	138	2,864
Illinois	57.2	3,126	841	2,342
Indiana	64.2	3,850	814	3,809
Kansas[a]	66.3	4,171	653	3,878
Kentucky	53.4	3,166	1,744	4,009
Louisiana[a]	49.3	3,524	96	3,519
Massachusetts[a]	66.7	4,944	142	4,011
Maryland	73.1	2,957	301	4,969
Maine	78.3	5,570	531	4,883
Michigan	73.2	2,324	1,434	3,396
Minnesota	78.1	4,409	590	4,440
Missouri	61.5	4,048	454	2,394
Mississippi	44	4,665	161	3,184
Montana	59	3,952	1,566	3,302
North Carolina[a]	55	3,364	1,367	2,555
North Dakota	78.8	7,637	2,023	6,155
Nebraska[a]	73.3	3,055	25	2,627
New Hampshire	66.8	2,426	265	4,092
New Jersey	89.6	4,420	1,174	3,938
New Mexico	80.4	1,496	269	3,115
Nevada[a]	69.7	3,549	134	2,564

State	Rebalancing Ratio (%)	Total Medicaid Spending per Enrollee per Month ($)		
		Non-Duals	Partial Benefit Duals	Full Benefit Duals
New York	52.1	3,564	1,253	5,293
Ohio	65.3	3,350	170	3,320
Oklahoma	63.2	4,061	17	2,388
Oregon	93	1,365	1,532	2,607
Pennsylvania	71.5	1,401	351	3,881
Rhode Island[a]	38.1	4,298	361	4,135
South Carolina	73.1	3,025	112	2,719
South Dakota	58.5	4,479	396	3,253
Tennessee[a]	75.5	1,409	39	4,590
Texas	73.7	2,336	925	2,573
Utah[a]	83.4	2,031	1,216	3,262
Virginia	82.2	4,346	70	3,616
Vermont	73.9	3,796	385	4,395
Washington	84.8	2,947	2,104	2,517
Wisconsin	71.2	1,480	191	1,630
West Virginia[a]	90.6	2,559	2,852	4,236
Wyoming	76.8	1,851	97	3,343

Source: RTI analysis of TAF RIF enrollment and claims data, 2016–2019.
Notes: [a] These states had at least one year in the study period that was omitted from analyses due to data quality issues. See Appendix A for more details. [b] Florida was omitted from analyses, as two years had a high proportion of enrollees with LTSS use but no paid claims. See Appendix A for more information.

Table B-4. Percentage of Months with Only HCBS Use When Enrollees Received Institutional LTSS Use During the Following Month, 2016-2019

		Ages 18–64		Age 65+	
		ID/DD Diagnosis, %			
State	All LTSS Users	Without	With	Without	With
United States	0.3	0.3	0.1	0.5	0.4
Alabama	0.3	0.2	0.2	0.5	0.0
Alaska	0.1	0.1	0.0	0.1	0.0
Arizona	0.3	0.1	0.1	1.0	0.3
Arkansas[a]	0.3	0.2	0.1	0.5	0.2
California	1.5	2.2	0.2	1.9	0.8
Colorado[a]	0.3	0.2	0.1	0.4	0.3
Connecticut	0.3	0.2	0.1	0.5	0.3
Delaware	0.8	1.2	0.2	0.6	0.0
District of Columbia	0.4	0.5	0.1	0.3	0.0
Florida[b]	—	—	—	—	—
Georgia	0.2	0.1	0.1	0.3	0.3
Hawaii	0.2	0.1	0.0	0.4	0.0
Idaho	0.2	0.1	0.1	0.3	0.0
Illinois	0.3	0.3	0.3	0.3	0.7
Indiana	0.4	0.3	0.2	0.8	0.5
Iowa	0.3	0.2	0.2	0.6	0.5
Kansas[a]	0.2	0.1	0.0	0.5	0.0
Kentucky	0.2	0.1	0.1	0.5	0.2
Louisiana[a]	0.2	0.1	0.1	0.3	0.0
Maine	0.3	0.0	0.0	1.2	0.1
Maryland	0.1	0.1	0.1	0.3	0.2
Massachusetts[a]	0.4	0.4	0.2	0.4	0.3
Michigan	0.6	0.5	0.3	0.9	0.4
Minnesota	0.2	0.1	0.1	0.4	0.3
Mississippi	0.3	0.2	0.2	0.3	0.3
Missouri	0.3	0.2	0.1	0.3	0.8
Montana	0.3	0.1	0.0	0.5	0.0
Nebraska[a]	0.4	0.4	0.1	0.4	0.2
Nevada[a]	0.1	0.1	0.1	0.2	0.0
New Hampshire	0.3	0.2	0.1	0.6	0.0
New Jersey	0.2	0.2	0.1	0.3	0.3
New Mexico	0.1	0.0	0.0	0.2	0.0
New York	0.3	0.2	0.1	0.4	0.3
North Carolina[a]	0.3	0.2	0.2	0.4	0.4

		Ages 18–64		Age 65+	
		ID/DD Diagnosis, %			
State	All LTSS Users	Without	With	Without	With
North Dakota	0.5	0.3	0.2	1.0	0.0
Ohio	0.4	0.2	0.2	0.6	0.5
Oklahoma	0.5	0.4	0.2	0.6	0.5
Oregon	0.1	0.1	0.0	0.2	0.2
Pennsylvania	0.2	0.1	0.1	0.3	0.3
Rhode Island[a]	0.5	0.4	0.0	0.7	0.0
South Carolina	0.2	0.1	0.1	0.3	0.2
South Dakota	0.3	0.1	0.1	0.9	0.2
Tennessee[a]	0.3	0.1	0.1	1.1	0.4
Texas	0.2	0.1	0.1	0.3	0.3
Utah [b]	0.1	0.1	0.1	0.4	0.4
Vermont	0.3	0.1	0.0	0.7	0.0
Virginia	0.6	0.5	0.1	0.7	0.6
Washington	0.2	0.2	0.1	0.3	0.5
West Virginia[a]	0.2	0.1	0.1	0.4	0.0
Wisconsin	0.2	0.1	0.1	0.4	0.4
Wyoming	0.2	0.1	0.0	0.7	0.0

Source: RTI analysis of TAF RIF enrollment and claims data, 2016-2019.
Notes: [a] These states had at least one year in the study period that was omitted from analyses due to data quality concerns. See Appendix A for more details. [b] Florida was omitted from analyses, as two years had a high proportion of beneficiaries with LTSS use but no paid claims. See Appendix A for more information.

Table B-5. Percentage of Months with Institutional LTSS Use When Enrollees Received Only HCBS Use During the Following Month, 2016-2019

State	All LTSS Users, %	Age 18–64		Age 65+	
		ID/DD Diagnosis, %			
		Without	With	Without	With
United States	0.9	2.2	1.1	0.6	0.5
Alabama	0.3	0.6	0.9	0.2	0.0
Alaska	0.7	1.3	2.0	0.4	0.0
Arizona	0.4	0.5	2.0	0.4	0.0
Arkansas[a]	0.0	0.0	0.0	0.0	0.0
California	2.6	8.3	1.8	0.8	0.7
Colorado[a]	1.1	1.5	1.3	0.9	0.9
Connecticut	0.5	1.4	0.7	0.3	0.3
Delaware	2.1	7.3	2.2	0.2	0.0
District of Columbia	1.6	4.5	0.6	0.3	0.0
Florida[b]	—	—	—	—	—
Georgia	1.4	1.6	1.1	1.4	0.9
Hawaii	0.4	0.8	0.0	0.3	0.0
Idaho	0.5	1.0	0.7	0.3	0.0
Illinois	0.4	0.8	0.8	0.2	0.5
Indiana	0.4	0.8	0.6	0.2	0.2
Iowa	0.2	0.6	0.4	0.1	0.0
Kansas[a]	0.3	0.7	0.5	0.2	0.0
Kentucky	0.1	0.3	0.4	0.0	0.0
Louisiana[a]	0.1	0.3	0.2	0.1	0.0
Maine	0.2	0.0	0.0	0.2	0.0
Maryland	0.4	1.0	1.0	0.2	0.3
Massachusetts[a]	1.1	4.5	4.2	0.3	0.8
Michigan	3.6	7.6	7.6	2.7	1.4
Minnesota	0.5	2.1	1.7	0.2	0.6
Mississippi	0.2	0.4	0.4	0.1	0.0
Missouri	0.1	0.1	0.3	0.0	0.0
Montana	0.3	0.8	0.0	0.2	0.0
Nebraska[a]	0.8	1.3	0.5	0.7	0.0
Nevada[a]	0.3	0.5	0.2	0.2	0.0
New Hampshire	0.9	2.9	2.6	0.6	0.0
New Jersey	0.2	0.6	0.5	0.1	0.1
New Mexico	0.6	1.1	0.7	0.5	0.0
New York	1.1	2.3	1.6	0.8	1.0
North Carolina[a]	0.4	1.0	0.4	0.2	0.0

State	All LTSS Users, %	Age 18–64		Age 65+	
		ID/DD Diagnosis, %			
		Without	With	Without	With
North Dakota	0.3	0.9	0.5	0.2	0.0
Ohio	0.4	0.9	0.9	0.2	0.5
Oklahoma	0.7	1.2	0.7	0.5	0.3
Oregon	1.4	2.5	3.1	1.1	0.0
Pennsylvania	0.3	1.1	0.9	0.1	0.2
Rhode Island [a]	0.8	1.0	0.0	0.8	0.0
South Carolina	0.2	0.7	0.7	0.1	0.0
South Dakota	0.2	0.6	1.4	0.1	0.0
Tennessee[a]	1.1	1.8	0.6	0.9	0.7
Texas	1.0	0.7	0.7	1.1	0.7
Utah[a]	0.9	1.0	0.7	0.9	0.9
Vermont	1.5	2.6	0.0	1.4	0.0
Virginia	2.2	3.6	2.1	1.9	1.8
Washington	1.2	2.4	2.9	0.8	0.7
West Virginia[a]	0.4	1.3	0.6	0.2	0.0
Wisconsin	2.3	4.4	2.9	2.0	2.0
Wyoming	0.3	1.0	0.0	0.2	0.0

Source: RTI analysis of TAF RIF enrollment and claims data, 2016-2019.
Notes: [a] These states had at least one year in the study period that was omitted from analyses due to data quality concerns. See Appendix A for more details. [b] Florida was omitted from analyses, as two years had a high proportion of beneficiaries with LTSS use but no paid claims.