

**Long-Term Services and Supports for Minnesota's Older
Population: Current and Future Utilization and
Medicaid Payments**

**Own Your Future 3.0: Planning for
Minnesotans' LTSS Needs**

**Prepared for Minnesota Department of Human Services,
Aging and Adult Services Division**

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Executive Summary

This is the final report from the project, *Long-Term Services and Supports for Minnesota's Older Population: Current and Future Utilization and Payments*, which was conducted as part of a larger study, *Own Your Future 3.0: Planning for Minnesotans' LTSS Needs*, sponsored by Minnesota's Department of Human Services, Aging and Adult Services Division.

The objectives of the project were to:

- Study current and future use of Long-Term Services and Supports (LTSS) for older Medicaid enrollees and the general older population in Minnesota.
 - Describe the baseline characteristics, LTSS service utilization, and LTSS expenditures for Minnesota's older population in 2016-2021.
 - Describe current utilization of LTSS, including nursing facility residents, Medicaid residents in assisted living facilities¹, and users of Medicaid home and community-based services.
 - Describe demographic characteristics (age, marital status, race/ethnicity, and place of residence) and care needs (dementia/cognitive impairment, behavioral health conditions and dependencies in activities of daily living) of people participating in LTSS.
 - Estimate the COVID-19 impact on LTSS utilization.
- Develop projections for utilization and payments for LTSS in Minnesota from 2023-2035
 - Project the need for LTSS based on changes in the demographic characteristics of Minnesota's older population.
 - Estimate future Medicaid LTSS utilization and expenditures.

The study focuses on Minnesotans aged 65 and older using LTSS, which include nursing facilities, regardless of Medicaid enrollment status, and Medicaid participants with an Elderly Waiver, Alternative Care, Personal Care Assistant or other home and community-based care.

Methods

The study draws on Minnesota-specific data from the US Census, Minnesota's Medicaid Management Information System (MMIS), and other state administrative systems. In order to estimate future need and use of LTSS, the study relies on demographic and population projections for the overall Minnesota population aged 65 and older. The analysis is divided into three periods: pre-COVID Baseline from 2016-2019, COVID period 2020 through the first six months of 2022, and future projections from 2023-2035. Using information on patterns of care and payments during the Baseline and COVID periods, combined with Minnesota population projections, the study estimates future LTSS use and payments through 2035.

Findings

Minnesota's Older Population– *Is growing in total and especially older age groups that are most likely to have LTSS needs.*

The general population of Minnesotans aged 65 and older is estimated to be 1 million in 2023 and it is projected to increase to 1.2 million in 2035. The age group 75-84, made up largely of

¹ Although the DHS categorizes an assisted living facility as a home and community-based service, we report separately on use of LTSS by Medicaid enrollees in this residential setting because of its unique features.

the “baby boomer” generation, will grow most rapidly by 50% while people aged 85 and older will also steadily increase by 28%. Minnesota’s older population is diverse and promises to be even more so in the future.

Users of Long-Term Supports and Services - *Comprise a small percent of older Minnesotans but over 50% of the older Medicaid enrollees.*

The primary LTSS population as defined in this study was only a small percentage of the total Minnesota population aged 65 and older. Of a total older population of over 920,000 in 2019, only 46,600 (5%) were using LTSS. Among LTSS users, 40,000 were enrolled in Medicaid and 6,000 were users of nursing facilities not enrolled in Medicaid. The LTSS users represented 54% of the estimated 75,000 Medicaid enrollees in that year.

The LTSS users were divided among different care settings and Medicaid enrollment status. The majority of LTSS users were in residential settings:

- 26% were nursing facility residents enrolled in Medicaid, 13% were nursing facility residents without Medicaid.
- 18% were Medicaid enrollees through an Elderly Waiver in assisted living facilities.
- Among LTSS users in non-residential settings, 32% were participating in an Elderly Waiver in a home and community-based setting, 5% had a Personal Care Assistant (PCA) outside of a waiver, and 5% were participating in the Alternative Care waiver program.

New Entrants into LTSS - *Represent only about 30% of LTSS users in a given year.*

The number of first-time users of LTSS who entered LTSS annually was only about 14,000, or 1% of the total older population. The remainder of annual LTSS users (about 32,000) were in the LTSS system at the start of the year or re-entered from a prior period of LTSS use.

Medicaid Enrollment and LTSS Use – *Slightly over half (56%) of first-time LTSS users became enrolled in Medicaid during the month they entered LTSS.*

The majority of people entering an assisted living facility or nursing facility became enrolled within one month of entry, while those entering Medicaid home and community-based services (HCBS) (Elderly Waiver-HCBS or PCA outside of a waiver) were Medicaid enrolled well before entry. Among new entrants to nursing facilities who were not Medicaid enrolled in the month of entry, the majority either converted to Medicaid in more than 2 years after entering the facility or died without becoming enrolled.

Diversity in Demographics of LTSS Users – *Demographic characteristics varied widely by setting and type of LTSS.*

About half of LTSS users in residential settings (nursing facilities and assisted living facilities) were aged 85 and older with the highest percentage (62%) among nursing facility residents not Medicaid enrolled. Only about one-fifth of Medicaid HCBS participants (Elderly Waiver HCBS, PCA without a waiver, and Alternative Care) were aged 85 or older. The vast majority of LTSS users in residential settings were White, non-Hispanic. In contrast, nearly half of people using Medicaid HCBS, particularly Elderly Waiver and PCA without a waiver, were from Black/African American, Asian/Pacific Islander, Hispanic, or Native American. A majority of LTSS users in all settings were unmarried, with most being widowed.

LTSS Care Needs: Dementia, Behavioral Health Conditions, and Dependencies in Activities of Daily Living (ADL) – *Nursing facility residents had the highest care needs, followed closely by assisted living facility residents.*

People using LTSS in nursing facilities and assisted living facilities were most likely to be suffering from dementia and/or cognitive impairment, with the highest percentages (71%) among assisted living facility residents and Medicaid residents of nursing facilities (70%). Assisted living facility residents also experienced substantial behavioral health conditions (62%), most of which were related to dementia. The highest average number of ADL dependencies was among nursing facility residents (5 of 8 ADL dependencies). Residents of assisted living facilities averaged just above 3 dependencies, while Medicaid HCBS participants averaged just under 3 dependencies.

The COVID-19 Effect – *Use of LTSS declined during the COVID pandemic, especially among new nursing facility entrants.*

The number of short-stay nursing facility entrants, both Medicaid and non-Medicaid enrollees, which were already trending downward from 2016-2019, dropped sharply in 2020 with the COVID-19 pandemic. The number of Medicaid enrollees entering nursing facilities continued a decline in 2021. The number of new entrants to Medicaid HCBS and assisted living facilities also dropped in 2020 with the pandemic; however, their numbers rose again in 2021, particularly among new entrants to Medicaid assisted living facilities where the number of new entrants exceeded prior years. The trends in annual users of LTSS before and during the pandemic also declined during the pandemic, due to fewer new entrants, shorter stays and COVID-related mortality. Although the numbers of LTSS users changed with the pandemic, their characteristics were very similar between the pre-COVID and COVID periods.

Mortality During the COVID-19 Period – *Nursing facility residents experienced the highest increase in mortality during the COVID period.*

When annual LTSS user cohorts beginning March of each year were followed for 12 months (through February of the following year) we found a large increase in all-cause mortality rates. The excess deaths, or differences in mortality between the pre-COVID-19 and COVID-19 periods, could be attributed to COVID-19 either directly or indirectly. The rate of mortality among nursing facility residents, already much higher than for other LTSS participants, rose substantially in 2020 during the first 12 months of the pandemic. Medicaid assisted living facility residents had lower mortality rates than nursing facility residents but much higher mortality rates than participants in the Elderly Waiver-HCBS, Alternative Care, and PCA without a waiver.

Projected Use of LTSS under the Base Case - *Use of LTSS is projected to grow by 26% from 2023-2035, assuming the Base Case where patterns of care return to those observed in the pre-COVID-19 period.*

The total number of people using any LTSS annually under the Base Case is projected to increase from 51,870 in 2023 to 65,343 in 2035. The largest projected increase is in the 75-84 age group (17,681 to 26,548), followed by the 85 and older age group (16,470 to 21,000). The number of people in the 65-74 age group is projected to increase only slightly (17,719 to 17,794).

Because users of residential care are on average older than users of home and community-based services, the numbers of residential care users are projected to increase more rapidly as the LTSS population ages. The percentage increases between 2023 and 2035 range from 22% for use of personal care assistants to 31% for use of nursing facilities by people not enrolled in Medicaid and 29% for use of nursing facilities by people enrolled in Medicaid.

The largest projected increases in use are for Medicaid enrollees using nursing facilities (19,388 to 25,015), non-Medicaid users of nursing facilities (14,325 to 18,724), and Medicaid enrollees using assisted living facilities (13,058 to 16,708). Smaller yet still substantial increases are projected for users of personal care assistants (11,690 to 14,268) and other home and community-based services (18,108 to 22,593). The numbers using access and case management services, as well as home health and hospice are also projected to grow steadily with the aging of the population.

Medicaid Payment for LTSS – *Annual Medicaid payments are projected to grow 71% from 2023-2035 due to increasing costs of care combined with increased utilization.*

Medicaid payments for nursing facility care are projected to increase by 74% from \$1,103 million in 2023 to \$1,758 million in 2035. Medicaid payments for assisted living facility care are projected to increase by 72% from \$302 million to \$520 million. Increases in other LTSS payments from 2023 to 2035 range from 64% to 68%. The projected increases are \$315 to \$517 million for personal care assistants, \$113 to \$190 million for other HCBS services, \$30 to \$51 million for case management, \$17 to \$28 million for access services, \$80 to \$134 million for home health and skilled nursing, and \$107 to \$180 million for hospice care.

Simulations of Alternative Scenarios for LTSS Users in 2025-2029, 2030-2034, and 2035-2039.

In order to test underlying assumptions behind the projected LTSS growth in usage and dollars, it was decided to utilize microsimulation models to test “what if” analyses. A simulation model developed specifically for this project was used to simulate LTSS use and payments for cohorts of new entrants into LTSS in future years (2025-2029, 2030-2034, and 2035-2039). For this round of assumption testing three scenarios were simulated:

1. A Base Case with a return to pre-COVID rates of total LTSS use;
2. COVID-19-related decline in rates of total LTSS use coupled with a shift away from nursing facility to other type of LTSS;
3. Base Case rates of total LTSS use combined with a shift away from nursing facility use.

All three scenarios resulted in projected increases in total Medicaid payments between periods. For example, Base Case payments were projected to rise by 53% from \$2,887 million for the 2025-2029 cohort to \$4,423 million for the 2035-2039 cohort. Compared to the Base Case, the decline in total LTSS usage rates associated with COVID-19 had a significant impact on simulated total Medicaid payments. Payments were 29% less for the 2025-2029 cohort, 30% less for the 2030-2034 cohort, and 35% less for the 2035-2039 cohort. The third scenario, with a NF-shift but no COVID-related decline in utilization, resulted in only a small change from the Base Case with only a 0.3% - 0.4% difference in payments

If declines in LTSS use associated with COVID-19 and/or the downward trend in nursing facility use were to continue, the result would be much lower growth in projected LTSS use and payments.

We must add notes of caution. At the time of the report, we only had complete data through the first half of 2022, potentially the time when consumer negatives about nursing home use were at their highest. As a result, this analysis may be under-estimating the extent to which overall LTSS use will return to a pre-pandemic level; Medicaid payment reductions may be overestimated.

Also, this analysis may be underestimating the shift away from nursing facility use, which could accelerate in future years if consumer preferences for care settings change, the cost on nursing facility care continues to escalate, and alternatives to nursing facility care become more widely available and acceptable. Other settings, such as assisted living facilities or care in the home, may be more appropriate for people suffering from dementia but not yet having significant ADL dependencies and skilled nursing requirements.

This suggests that additional scenario testing should be undertaken with additional data from more recent years when they become available. Other scenarios should also be tested, such as those described below.

Major Conclusions

The report has presented considerable information about that segment of the Minnesota older population in need of and using long-term services and supports. This information includes their demographic characteristics and areas of need, their current use of LTSS, and their projected future LTSS use and payments over a time horizon from 2023-2035. The following are major conclusions from the report.

- Substantial increases in future LTSS need, utilization and costs are inevitable.
 - Aging of the older population will lead to increased need, particularly as the number of people of advanced old age increases.
 - Increases in LTSS use will be accompanied by increased payments for care because of LTSS cost inflation.
 - Future costs of LTSS may appear daunting, yet state revenues to support LTSS and people's ability to pay privately may also rise with growth in the economy.
- Only about 5% of older people in Minnesota are using LTSS annually and only about 1% are new entrants who begin using LTSS each year.
 - Even with future population projections, there will still be a relatively small percentage of the older population who need and use LTSS.
 - Despite their small numbers, older people in need of care incur very high public and private LTSS costs.
 - Although acute care costs for the LTSS population was not part of this study, we know from other sources that their acute care costs, through Medicare and out of pocket expenses, can be substantial, often well above their LTSS costs.
- The LTSS population is diverse.
 - Users of LTSS services vary widely in age, race/ethnicity, marital status, and other demographic characteristics; and they vary in the need for care for ADL dependencies and cognitive impairment.
 - They use a variety of LTSS services - nursing facilities, assisted living facilities, and home and community-based services.
 - Although Medicaid is the primary payer for LTSS, people not enrolled in Medicaid face sizable private payments for LTSS, particularly for nursing facility care.

- Future populations needing LTSS will become even more diverse with demographic shifts and the varying economic and social experiences of succeeding generations entering old age.
- Black/African American, Asian, Hispanic, Native American and other racial/ethnic groups are underrepresented in use of nursing facilities and Medicaid assisted living facilities. These and other differences in patterns of LTSS service use raise questions about equity in access to LTSS both currently and in the future.
- The LTSS services and settings form a complex system of care.
 - Older people are continuously entering and exiting the LTSS system; people make multiple transitions between types of LTSS; and Medicaid enrollment is dynamic.
 - A change in one part of the system can have ripple effects on other parts. For example, if nursing facilities experience a decline in demand due to absence of available providers, shift in consumer preferences, escalating costs, or a new pandemic, then other options must be made available if rising needs for care are to be met.
 - In the current LTSS system, nursing facility residents are older and have substantial need for assistance in activities of daily living, often combined with cognitive impairment and complex medical conditions. In contrast, residents of assisted living facilities are less dependent in activities of daily living, yet they are very likely to suffer from cognitive impairment, frequently accompanied by behavioral health conditions. People participating in the HCBS waiver or PCA, while having significant care needs, tend to be younger, less ADL dependent and less likely to be cognitively impaired.
 - Changes in Medicaid policy designed to divert people from one type of LTSS to another, for example from residential to home and community based LTSS, should account for current differences in need across care settings and they should be pursued cautiously.
- The “new normal” after COVID-19 could have a major influence on future patterns of LTSS.
 - Declines in rates of COVID-related LTSS use may continue, as fewer people enter the formal LTSS system.
 - The trend of shifting away from nursing facility care to assisted living facilities or home and community-based services may continue.
 - A decline in overall rates of LTSS use associated with COVID-19 could have an impact on future LTSS payments; however, this scenario is less likely than a shift in types of LTSS use.

Future Study and Policy Implications

Predicting future LTSS usage and dollars is complicated by multiple uncertainties, many of which are beyond the scope of this study. However, they should be addressed in future studies, with the aid of additional simulation modeling or other approaches to provide a higher degree of certainty around future policies. Areas for future study and policy development:

- New normal after COVID-19

- Trends observed in the current study, based on data through mid-2022, offer a less than complete picture of the lasting COVID-19 effect.
- After a sharp decline in LTSS use during 2020, particularly in entry to nursing facilities, there was only a partial return to the pre-COVID level in the following year.
- Future projections of LTSS use and Medicaid payments are highly sensitive to assumptions about the persistence of the COVID-19 effect as well as the response of the system to a future pandemic.
- Gathering additional data on the post-COVID-19 experience can lead to more informed modeling of future LTSS use and costs.
- Changing consumer preferences
 - Personal preferences by consumers and their significant others appear to be shifting away from nursing facilities to other LTSS settings and services.
 - COVID-19 accelerated this trend and resulted in a sharp decline in nursing facility use, particularly among Medicaid enrollees.
 - Additional data on post-COVID patterns of LTSS use can shed light on consumer preferences and more informed modeling of a shift away from nursing facilities to other forms of LTSS.
- Alignment of individual needs for care with LTSS services and settings
 - Changes in health conditions and disability status of the older population, either improvements or declines, could alter the need for and use of LTSS.
 - Projections for the mix of future LTSS services should consider, in particular, the increased prevalence of dementia/cognitive and associated health-related behavioral problems, and the settings and types of services most appropriate for these care needs.
- Role of families and other informal caregivers
 - Users of Medicaid LTSS are much older and less likely to be married than the general older population. Although detailed information was not available for the study, other research suggests that many LTSS users were living alone without immediate support from family or other caregivers.
 - Gathering additional data on patterns of family and other informal resources could fill the gap in information about these valuable resources.
 - More information can lead to modeling of future availability of informal care. Declines in the availability of family and other private provisions of care, paid and non-paid, could put additional pressure on the formal LTSS system to fill this gap in care, particularly through use of nursing facilities and assisted living facilities.
- Equity and access to care for racial and ethnic minorities
 - Although racial and ethnic minorities are well represented among LTSS users in community settings, only small percentages use nursing and assisted living facilities. This situation raises issues of equity and access to care.
 - Is their heavy reliance on home and community-based services (e.g., Elderly Waiver and personal care assistant) a matter of personal choice, cultural traditions, greater

- availability of family or other informal caregivers, or other care resources?
Conversely, are they less likely to use residential care facilities because of a history of discrimination, high out-of-pocket costs, or other access barriers?
- Understanding and addressing these issues will have implications for future LTSS as the number of older racial and ethnic minorities increases. Future LTSS projections should account for different scenarios of LTSS use by racial and ethnic minorities.
 - Supply of care workers and providers
 - The future supply of care workers and providers is uncertain. Even before COVID-19, attracting and maintain a caregiver workforce was a challenge. The problem has worsened in subsequent years.
 - There are shortages of paraprofessional workers, licensed nurses, especially RNs and APNs, and ancillary staff.
 - Future projections will have to consider scenarios where care worker shortages place constraints on the expansion of LTSS and potentially contribute to LTSS cost inflation.
 - Costs and financing of LTSS
 - The current study had a substantial gap in information about private payments for LTSS, which in total could approach Medicaid payments. Although the study included use of nursing facility care by people not enrolled in Medicaid, the substantial private cost of this care was not part of the projections. In addition, the study does not consider Medicaid enrollee's share of costs for nursing facilities, assisted living facilities, and the Alternative Care waiver. Finally, the study lacked information entirely about use of and private payments for assisted living facilities and in-home care for people not enrolled in Medicaid.
 - The LTSS cost inflation may significantly exceed the rate of general inflation and personal income, making LTSS even less affordable and putting additional strains on public resources.
 - While nursing facility use has been declining, the Medicaid payment rate per resident day has risen. Since the private pay rate is tied to the Medicaid rates, costs for private paying residents have been going up as well.
 - Improvements in the quality of care by assisted living facilities and home care agencies could contribute to cost increases. Much needed initiatives include stronger licensure requirements, more comprehensive quality of care oversight, increased staffing levels and standards, and higher wages and benefits to attract and maintain the caregiver workforce.
 - The uncertain evolution of the private LTC insurance market, which has been slow in developing, could be a wildcard with the potential to offer asset and income protection for future generations of older people. However, the near-term impact of private LTC insurance is limited by the high cost of insuring the current generation of older people who are at highest risk of needing LTSS. Even longer-term prospects are problematic for a market that has failed to develop on its own.
 - All these factors lead to complexity in projecting future need, use and expenditures for LTSS. Probably the best way to address this complexity and characterize the

uncertainty of future projections is through micro-simulation modeling which is capable of performing “what if” analyses of alternative scenarios.

Table of Contents

Executive Summary.....	2
Table of Figures.....	13
Location of Tables.....	14
Chapter 1 Introduction	15
Project Objectives.....	15
Overview of Chapters	15
Project Team	16
Chapter 2. Methods and Data Sources	17
LTSS Population	17
Users of Post-Acute Nursing Facility Care	17
Older Participants in the Disability Waiver	17
Gaps in Information about Private Sources of LTSS.....	17
Racial and Ethnic Categories	18
Major Variables and Data Sources.....	18
LTSS Program and Setting	18
Demographic Characteristics and Functional Need of the Older LTSS Population.....	18
LTSS Services and Medicaid Payments.....	19
Population Projections for Minnesota’s Older Population 2023-2035.....	19
Analysis Strategies	20
Chapter 3. Patterns of LTSS Use and Characteristics of the.....	22
LTSS Population during the Baseline Period (2016-2019).....	22
LTSS Population in the Context of the Total Older Population and Medicaid Enrollees	22
New Entry in LTSS for People with No Prior LTSS Use.....	23
Distribution of LTSS Users Across Programs and Settings.....	24
Demographic Profile of LTSS Users	25
Profile of LTSS Need -- Dementia/Cognitive Impairment, Behavioral Health Conditions and ADL Dependencies.....	28
Chapter 4. The COVID-19 Pandemic and Trends in LTSS from	32
Baseline (2016-2019) through the COVID-19 period (2020-2021).....	32
Trends in Annual LTSS Users by Type of LTSS	34
Trends in Characteristics of LTSS Users	36
Trends in Twelve-Month All-Cause Mortality for LTSS Cohorts beginning in March 2018-2021	37
Chapter 5. Base Case Current and Future Utilization and Payments for LTSS.....	39

Simplifying Assumptions.....	39
Demographic Projections and Baseline LTSS Utilization and Payments.....	39
Base Case Projections of the Number of People Using LTSS Services Annually by Age Group, 2023-2035	41
Base Case Projections for Total Annual Payments for LTSS Services.....	44
Chapter 6. Micro-Simulation	49
Introduction.....	49
Simulations Compared to Straight-Line Projections in Chapter 5	50
Simulation Details: Data Sample and Variables.....	50
Simulation Details: Model Overview.....	51
Simulation Details: LTSS Categories	51
Simulation Details: Simulation Runs	52
Results	53
Total 5-Year Person Months for Each Scenario.....	56
Annual Average Medicaid Payments for Each Scenario	62
Caveats and Simplifying Assumptions.....	69
Chapter 7. Summary and Conclusions	70

Table of Figures

Figure 3.1 Annual Number of People Entering LTSS for the First Time, using LTSS, and Existing LTSS (2016-2019)	23
Figure 3.2 Months of Prior Medicaid Enrollment for those Medicaid Enrolled at First Entry	24
Figure 3.3 Months to Medicaid Enrollment for those Not Medicaid Enrolled at First Entry	24
Figure 3.4 Average Annual LTSS Users of Care by LTSS Category (2016-2019).....	25
Figure 3.5 Annual LTSS Users of Care by Age (2016-2019)	26
Figure 3.6 Annual LTSS Users of Care by Gender (2016-2019)	26
Figure 3.7 Annual LTSS Users of Care by Marital Status (2016-2019).....	27
Figure 3.8 Annual LTSS Users of Care - Racial/Ethnic Groups (2016-2019).....	27
Figure 3.9 Annual LTSS Users of Care by Residence (Annually 2016-2019).....	28
Figure 3.10 Annual LTSS Users of Care by Dementia/Cognitive Impairment and Behavioral Health Conditions (Annually 2016-2019)	29
Figure 3.11 Combinations of Dementia/Cognitive Impairment (CI) and Behavioral Health Conditions (Annually 2016-2019).....	29
Figure 3.12 Combinations of Dementia/Cognitive Impairment and Behavioral Health Conditions by LTSS Type (Annually 2016-2019)	30
Figure 3.13 Annual LTSS Users of Care by Average Number ADL Dependencies, Range = 0-8 (Annually 2016-2019).....	30
Figure 4.1 Number of New Entries with Short Nursing Facility Stays (< 90 days)	33
Figure 4.2 Number of New Entries with Nursing Facility Stays 90 Days or Longer	33
Figure 4.3 Number of New Entries to Medicaid Assisted Living and Medicaid HCBS	34
Figure 4.4 Number of Annual Nursing Facility Residents with Stays of 90 days or More	35
Figure 4.5 Number of Annual Medicaid Assisted Living and Medicaid HCBS Users	35
Figure 5.1 Projections - Total Minnesota Population by Age Categories	40
Figure 5.2 Mean Medicaid Payments / Month / User by LTSS Service Annually for Years 2016-2019	41
Figure 5.3 Total Annual Medicaid Payments (\$ Millions) (2016-2019).....	41
Figure 5.4 Projected Total Number of Annual LTSS Users	42
Figure 5.5 Projected Total Number of Annual LTSS Users by Age	42
Figure 5.6 Projected Annual Users of Nursing Facilities and Assisted Living Facilities by Year ..	43
Figure 5.7 Projected Annual Users of Personal Care Assistant or Other Home and Community-Based (HCBS) Services by Year	43
Figure 5.8 Projected Annual Users of Case Management or Access Services by Year	44
Figure 5.9 Projected Annual Users of Home Health and Skilled Nursing or Hospice by Year	44
Figure 5.10 Projected Total Annual Medicaid Payments (\$ Millions, 2.5% annual inflation)	45
Figure 5.11 Projected Medicaid and Payments for Nursing Facilities and Assisted Living Facilities (\$ Millions, 2.5% annual inflation)	45
Figure 5.12 Projected Medicaid Payments for Personal Care Assistant and other HCBS (\$ Millions, 2.5% annual inflation)	46
Figure 5.13 Projected Medicaid Payments for Case Management or Access Services (\$ Millions, 2.5% annual inflation).....	46
Figure 5.14 Projected Medicaid Payments for Home Health or Hospice (\$ Millions, 2.5% annual inflation)	47

Figure 6.2 Survival Rate by Entry LTSS Subgroup over 5 Year Period (All Three Scenarios Included)	55
Figure 6.3 Medicaid Conversion Rate by Entry LTSS Subgroup over 5 Year Period (All Three Scenarios Included).....	56
Figure 6.4 EW Community Mean Months by Simulation Cohort and Scenario	59
Figure 6.5 EW Residential Mean Months by Simulation Cohort and Scenario.....	59
Figure 6.6 Medicaid NF Mean Months by Simulation Cohort and Scenario.....	60
Figure 6.7 Non-Waiver PCA Mean Months by Simulation Cohort and Scenario.....	60
Figure 6.8 Alternative Care Mean Months by Simulation Cohort and Scenario	61
Figure 6.9 Non-Medicaid NF Mean Months by Simulation Cohort and Scenario.....	61
Figure 6.10 EW Community Mean Annual Dollars by Simulation Cohort and Scenario	66
Figure 6.11 EW Residential Mean Annual Dollars by Simulation Cohort and Scenario.....	66
Figure 6.12 Medicaid NF Mean Annual Dollars by Simulation Cohort and Scenario.....	67
Figure 6.13 Non-Waiver PCA Mean Annual Dollars by Simulation Cohort and Scenario	67
Figure 6.14 Alternative Care Mean Annual Dollars by Simulation Cohort and Scenario	68
Figure 6.15 Non-MA NF Mean Annual Dollars by Simulation Cohort and Scenario.....	68

Location of Tables

Table 3.1 Minnesota total population, Medicaid enrollment and LTSS use in 2019.....	22
Table 3.2 LTSS users by Dementia/Cognitive Impairment, ADL Dependencies, and Type of LTSS	31
Table 4.1 Trends in Characteristics of New LTSS Entries by Year	36
Table 4.2 Mortality over 12 Months for Cohorts Beginning in March of 2018-2021 by LTSS Categories.....	38
Table 5.1 Percentage Increases from 2023 to Each Future in Use and Payment for LTSS	48
Table 6.1 Cohort Size by Scenario	52
Table 6.2 Distribution of Initial LTSS Subgroup by Age Group at Cohort Start.....	53
Table 6.3 Demographic and Functioning Characteristics by Simulation Cohort	54
Table 6.4 Simulated Means for Person Months of LTSS by Subgroup, Scenario, and Cohort.....	58
Table 6.5 Simulated Mean 5-Year Payment* Amounts by LTSS Subgroup, Simulation Cohort, and Scenario (Millions of Dollars).....	64

Chapter 1 Introduction

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 - Estimate the COVID-19 impact on LTSS utilization.
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The Minnesota's older population with LTSS includes older residents of nursing facilities, regardless of Medicaid enrollment status, and Medicaid participants with an Elderly Waiver, Alternative Care, or other home and community-based care. The study relies on Minnesota-specific data from the US Census, Minnesota's Medicaid Management Information System (MMIS), and other state administrative systems.

Overview of Chapters

In Chapter 2 we describe the methods and data sources for the study including our working definition of Minnesota's LTSS population. Chapter 3 presents demographic characteristics and functional needs of the LTSS population during the baseline period (2016-2019) before the COVID-19 pandemic for older people entering LTSS for the first time and those using care annually. Chapter 4 examines the COVID-19 impact on LTSS by describing trends in the characteristics and service use of the LTSS participants from the pre-pandemic baseline period (2016-2019) through the COVID-19 period (2020-2021). In Chapter 5 we present projections of LTSS service utilization and payments from 2023-2035 for a Base Case, assuming that the LTSS system will return to baseline (Pre-COVID) patterns of utilization and average payments for different LTSS services. These projections account for population growth, changes in the composition of the older population, and cost inflation. Chapter 6 presents findings from a micro-simulation where we simulate future experience (e.g., LTSS service use and payments, transitions between LTSS settings, Medicaid conversion, and mortality) of cohorts of people aged 65 and older entering LTSS for the first time in 2025, 2030, and 2035. These microsimulations test scenarios assuming Base Case patterns and post-pandemic "new normal" patterns of initial LTSS entry and future use of care.

A separate report, *Demographic, Social, and Economic Characteristics of the Current Population of Minnesotans Age 65 and Older*, authored by Lynn Blewett, presents an overview of the general population of Minnesota aged 65 and older, including their demographic, social and economic characteristics, as well as a comparison between people enrolled in Medicaid and those not enrolled.

Project Team

Lynn Blewitt from the University of Minnesota School of Public Health was the project leader. Mark Woodhouse of the University of Minnesota School of Public Health managed the project data and constructed analysis data sets. Greg Arling and Zachary Hass, Purdue University School of Nursing, did much of the analysis and were responsible for writing Chapter 3 describing the LTSS population (Greg Arling), trends in LTSS (Greg Arling), LTSS services and payment projections (Greg Arling), and the micro-simulations (Zachary Hass). Dongjuan Xu, Purdue School of Nursing, was responsible for descriptive statistics on prevalence of dementia/cognitive impairment, behavioral health conditions, and dependencies in activities of daily living.

The authors are solely responsible for the opinions expressed and any errors or omissions in the report.

Chapter 2. Methods and Data Sources

LTSS Population

The study covers Minnesota's older LTSS population which consists of people aged 65 and older who have used LTSS or demonstrate a need for this care, and for whom we have available data. The population consists of Medicaid and non-Medicaid nursing facility (NF) users, Medicaid Elderly Waiver (EW) program participants (EW – Assisted Living, EW – HCBS), Alternative Care waiver participants, and a Medicaid Personal Care Assistant without a waiver. The population is divided into these categories representing types of LTSS that are referred to throughout the report.

- Nursing facility residents enrolled in Medicaid.
- Nursing facility residents NOT enrolled in Medicaid, includes all other nursing facility residents.
- Medicaid Elderly Waiver-Assisted Living – Medicaid residents of assisted living facilities (customized living).
- Medicaid Elderly Waiver- HCBS – using home and community-based services in a non-residential setting. These services include adult day services, chore services, homemaker, personal care, home delivered meals, and consumer-directed community supports.
- Medicaid Personal Care Assistant (PCA) without a Waiver – care from a personal care assistant outside of an Elderly Waiver program.
- Alternative Care (AC) – a Medicaid waiver program which provides Medicaid-funded HCBS to older people not enrolled in Medicaid but who meet financial eligibility criteria just above the Medicaid threshold.

Users of Post-Acute Nursing Facility Care

Although the LTSS population can be broadly defined to include users of all types of nursing facility care, the findings in Chapters 3-5 exclude nursing facility residents whose only use of LTSS was a single post-acute NF stay of < 90 days. People whose use of LTSS involved post-acute care in combination with a longer nursing facility stay or other LTSS, were included in the findings. Narrowing of the population allows us to focus on more intensive users of LTSS services. Most short-stay nursing facility use was covered by Medicare for people who were not Medicaid enrolled. The simulation models described in Chapter 6 include all post-acute nursing facility users in order to gain a full picture of nursing facility utilization. However, most of these individuals were not Medicaid enrolled and/or their stays were paid for by Medicare. Therefore, including them in the simulations had limited impact on projected total nursing facility use or Medicaid LTSS expenditures.

Older Participants in the Disability Waiver

People aged 65 and older participating in a Disability Waiver were excluded from the analysis. They have significantly different characteristics and service use patterns than Elderly Waiver participants or other members of the LTSS population. Although it would have been informative to conduct a sub-group analysis of the older disabled population, it was not feasible within the scope of the study or available resources.

Gaps in Information about Private Sources of LTSS

We have a gap in data on people aged 65 and older who have significant long-term care needs but who have no history of nursing facility use or enrollment in Medicaid. They may be receiving

care in the community exclusively through family or other informal sources, formal HCBS that is paid for privately, or privately paid for assisted living, memory center, or other residential setting. We also do not have information about care received for privately paying nursing facility users if they return to a community setting without becoming enrolled in Medicaid.

Racial and Ethnic Categories

The racial and ethnic categories in the report (described below) are based on information collected through the Medicaid administrative system. These categories are the same as those used in the US Census. We recognize that designations for “race” and “ethnicity” are overly simplistic. The concept of race has a questionable biological foundation. Even as cultural categorization, race is an anachronism. Moreover, there are important social and cultural differences between people in each of the arbitrarily defined racial and ethnic categories. A major limitation of the study is our inability to consider the rich cultural differences among ethnic groups.

Major Variables and Data Sources

LTSS Program and Setting

The LTSS population was categorized into mutually exclusive programs and settings for ease of analysis. These categories (also listed above) are nursing facility (Medicaid or non-Medicaid); Medicaid Elderly Waiver – Assisted Living; Medicaid Elderly Waiver – HCBS; Medicaid Personal Care Assistant (PCA) without a waiver; and Alternative Care waiver. The Medicaid claims and other administrative files from the Medicaid Management Information System (MMIS) were used to categorize Medicaid enrollees (see Appendix – Chapter 2 Methods), while the Nursing Home Minimum Data Set (MDS) was the major source of information about nursing facility residents not Medicaid enrolled. Information on Medicaid enrollment came from Medicaid enrollment files.

Demographic Characteristics and Functional Need of the Older LTSS Population

Information on demographic characteristics and functional needs of individual members of the LTSS are drawn from the MMIS, MNChoices Long-Term Care Screening Document¹, or nursing home Minimum Data Set (MDS)². Demographic characteristics came from the MMIS for Medicaid enrollees and MDS for nursing facility residents not enrolled in Medicaid. Information on functional needs came from the MDS for people with a nursing facility stay, while information for users of Medicaid waiver services or PCA came from the MNChoices screening document. The two sources required harmonization because the MDS and MNChoices screening documents use a similar but not exact set of items. The details of the harmonization are included in Appendix Chapter 2 Methods.

Demographic Characteristics

- Age
- Gender
- Race/ethnicity -White non-Hispanic, Black/African American, Asian or Pacific Islander, American Indian or Alaska native, Hispanic, Multiple races/ethnicities
- Urban or rural county of residence: Twin Cities, other metropolitan area, or rural

¹ [MNChoices Long-Term Care Screening Documents](#)

² [Nursing Home Minimum Data Set \(MDS\) Assessment Instrument](#)

Functional Needs

- Dependency in activities of daily living: extensive assistance or total dependence in eating, bed mobility, transferring, walking, toileting, bathing, dressing, and grooming (MDS and MNChoices)
- Cognitive status – diagnosis of Alzheimer’s disease or other dementia (MDS or MMIS), impaired cognition (MNChoices), or moderate to severe cognitive impairment on the Cognitive Functional Scale (MDS).
- Behaviorally challenged – frequent history of behavioral symptoms (MNChoices) or overall presence of behavioral symptoms (MDS)

LTSS Services and Medicaid Payments

Minnesota’s MMIS was the primary source of information on LTSS service use and Medicaid payments. The individual categories of service for the individual Medicaid claims were grouped into the following categories.

- Nursing Facilities (COS 89 and 122)
- Elderly Waiver Assisted Living Facility (customized living COS 108)
- Elderly Waiver Home and Community-Based Services (HCBS) – adult day services (COS 102), chore services (COS 93), home delivered meals (COS 95), personal care (COS 38), homemaker (COS 96), and consumer-directed community supports (COS 21).
- Personal Care Assistant outside of an Elderly Waiver (COS 119)
- Home Health and Skilled Nursing (COS 89, 122, 20, and 114)
- Hospice (COS 72)
- Case Management (COS 44 and 71)
- Access Services (COS 100)

Service category definitions can be found in Minnesota DHS Provider Manual.¹

Population Projections for Minnesota’s Older Population 2023-2035.

Demographic projections were made in 2020 for older Minnesotans ages 65-74, 75-84, and 85 and older in five-year intervals – 2020, 2025, 2030, and 2035. We interpolated annual population projections between these age intervals. Further details about the population projections and data downloads are available at the Minnesota State Demographic Center.²

Study Time Periods

The study had three major time periods. We began with a Baseline period from 2016-2019. We chose this period because the available data were consistent over this period, it allowed enough time to assess multiyear trends in LTSS, and it represented the LTSS experience prior to disruption caused by the COVID-19 pandemic.

The second period from 2020-2021 took into account changes in LTSS taking place during the peak of the COVID-19 pandemic. Data on LTSS for 2022 were not available at the start of the study in October 2022. Therefore, we were limited in our ability to examine changes in LTSS as the pandemic subsided. We have to rely on the information available to us when forecasting either a return to normal or a new normal after the pandemic.

¹ [Minnesota DHS Provider Manual](#)

² [Minnesota State Demographic Center Population Projections](#)

The third period was 2023-2035 where we made projections of the future LTSS population, their use of LTSS and payments for care. This 13-year time frame is far enough in the future to assess the impact of growth in Minnesota's older population and LTSS cost inflation, without the greater uncertainty of long-term forecasts.

Analysis Strategies

We conducted both cross-sectional and longitudinal/cohort analyses. The cross-sectional analyses describe characteristics of the LTSS population and their use of care at a point in time (e.g., January 2019), annually, or an annual average over a multi-year period. In the longitudinal analysis we followed individuals from the point of entry into LTSS until death or the end of the available data (December 2021). We tracked their use of different types of LTSS, Medicaid conversion, and survival. Chapter 3 presents findings from a combination of cross-sectional and longitudinal analyses. Findings from the trend analysis in Chapter 4 involve comparisons of annual or period cross-sections. The figures presented in Chapters 3-5 are mainly in the form of graphics (line or bar graphs) or tables. The development of the Micro-Simulation model (Chapter 6) relied on multivariable statistical analysis.

The straight-line projections of future LTSS service use and payments, reported in Chapter 5, took place in steps. See Appendix - Chapter 5 Baseline Projections for a more detailed explanation.

1. Calculate the average annual per person months of Medicaid LTSS use and average monthly payments for users of LTSS by age group (age 65-74, 75-84, and 85 and older) and categories of service in the baseline period of 2016-2019.
2. Estimate the annual rate of Medicaid LTSS use per 1000 persons by age group in the Minnesota population in 2019.
3. Apply the annual rates of LTSS use to the annual population projections from 2020-2035, to estimate the annual number of user months for LTSS.
4. Using patterns of LTSS service use during the Baseline, allocate the projected increase in total user months across categories of service to project the total user months of LTSS services per year from 2023-2035.
5. Estimate annual projected Medicaid payments by multiplying average monthly payments for LTSS services during the Baseline period by projected months of future LTSS services, then adjust future payments for rates of LTSS cost inflation.

The Micro-Simulation

The micro-simulation used the data described above to build models of the movement of individuals between different LTSS subgroups. The models were trained to learn the patterns of how likely individuals were to move between specific subgroups and given that they were going between two specific subgroups, how many months the transition tends to take. Multinomial logistic regression models which adjusted for individual characteristics were used to model transition patterns. Right skewed probability distributions were used to model the amount of time individuals took to transition.

The micro-simulation generated case histories for LTSS utilization beginning in 2025, 2030, and 2035 and extending for 5 years each. Three scenarios were tested.

- Base Case assuming LTSS use and payments would return to the patterns observed during the pre-COVID baseline period (2016-2019).
- The COVID scenario assuming a decline in LTSS usage rates and a shift away from nursing facilities to other LTSS settings, which were the two main changes observed during the pandemic.
- A return to the pre-COVID level of LTSS use and payments, combined with a shift away from nursing facility use toward other LTSS services.

The number of individuals and the age group distribution in each future year are based on population projections adapted to the LTSS population. Each cohort within each scenario was simulated 150 times and results were summarized by mean and simulated confidence interval. Medicaid payments are based on averages for each LTSS subgroup and inflated using a 2.5% annual inflation rate.

Chapter 3. Patterns of LTSS Use and Characteristics of the LTSS Population during the Baseline Period (2016-2019)

In this chapter we present a description of LTSS population during the Baseline (2016-2019) period of the study. Information from the COVID-19 period (2020-2021) and a comparison to the Baseline period will be presented in Chapter 4. The characteristics of the LTSS population during the Baseline period serves as a starting point for utilization and payment projections in Chapter 5 and the simulations in Chapter 6. We rely heavily on available data on the current experience of LTSS participants when projecting their future characteristics, utilization patterns, and payments for care. We assume in our Base Case projections and simulations that current experience is the best indicator of LTSS patterns in the future. Having established the Base Case, we then test alternative scenarios for a COVID-19 effect and its implications for use of LTSS and payments.

The Baseline relies primarily on average annual figures for 2016-2019 for members of the LTSS population in one or more LTSS categories during those years. The averages are based on person-months of LTSS each year, or months of LTSS use by each member of the LTSS population during the year. Trends in these figures between years are described in the next chapter.

For ease of interpretation, the LTSS types of Elderly Waiver-HCBS, PCA without a waiver, and Alternative Care Waiver have been grouped into a general category of Medicaid home and community-based services (HCBS). Figures for the individual HCBS programs are contained in the Appendix Chapter 3 Characteristics of the LTSS Population at Baseline.

LTSS Population in the Context of the Total Older Population and Medicaid Enrollees

Medicaid enrollees and members of the LTSS population comprised small percentages of the total Minnesota population aged 65 and older in 2019 (Table 3.1). Only about 8% of the total population aged 65 and older was enrolled in Medicaid, while about 5% of the total using LTSS during the year. However, over half (54%) of Medicaid enrollees were using LTSS.

Table 3.1 Minnesota total population, Medicaid enrollment and LTSS use in 2019

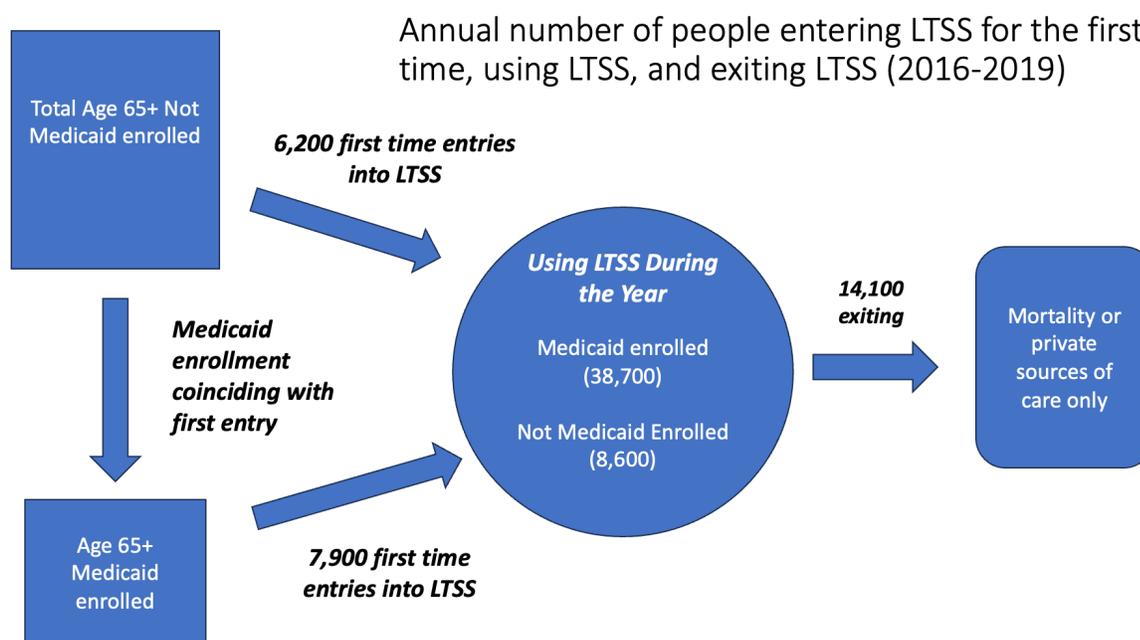
Population by Medicaid Enrollment 2019	Number	% of Total Age 65 and Older
Total Population Aged 65 and Older	920,675	100%
Medicaid Enrolled	74,795	8%
Not Medicaid Enrolled	845,880	92%
LTSS Population	46,610	5%
Medicaid Enrolled	40,457	4%
Not Medicaid Enrolled	6,153	1%

Note: Not Medicaid Enrolled LTSS represents nursing facility residents and Alternative Care Waiver participants not enrolled in Medicaid.

New Entry in LTSS for People with No Prior LTSS Use

The number of people entering LTSS for the first time each year from 2016-2019 averaged only about 14,100, with slight over half (56%) enrolled in Medicaid during the month they entered (Figure 3.1). The remaining users of LTSS (approximately 32,000) were using LTSS at the beginning of the year or were re-entering after using LTSS in the past two years. The figures on Medicaid enrollment at initial LTSS entry are dynamic because many people became Medicaid enrolled soon before or in the month they entered.

Figure 3.1 Annual Number of People Entering LTSS for the First Time, using LTSS, and Existing LTSS (2016-2019)



There were distinct patterns of Medicaid enrollment for people entering LTSS. The majority of people who were enrolled in Medicaid the month they entered an assisted living facility or nursing facility became enrolled within one month of entry (Figure 3.2). In contrast, those entering Medicaid HCBS (Elderly Waiver-HCBS or PCA outside of a waiver) were Medicaid enrolled several months before entry. Among people not Medicaid enrolled in the month of entry (nursing facility users and Alternative Care waiver participants), the majority either died without becoming enrolled or converted to Medicaid in more than 2 years after entry (Figure 3.3). As we will see in following chapter, many users of nursing facilities and Medicaid assisted living facilities are age 85 or older, female, and unmarried. They are likely to have diminished income and assets which increases their need for Medicaid coverage.

Figure 3.2 Months of Prior Medicaid Enrollment for those Medicaid Enrolled at First Entry

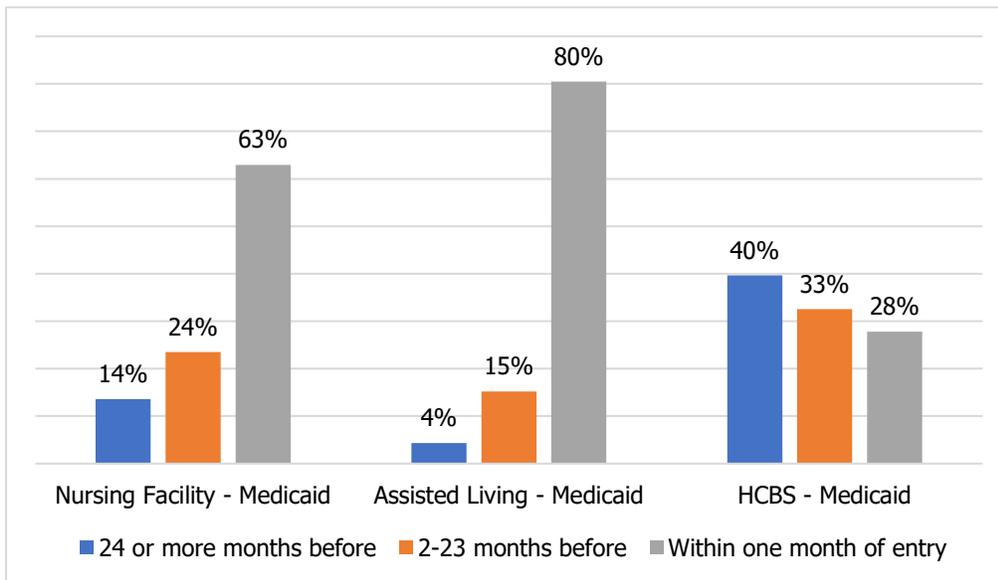
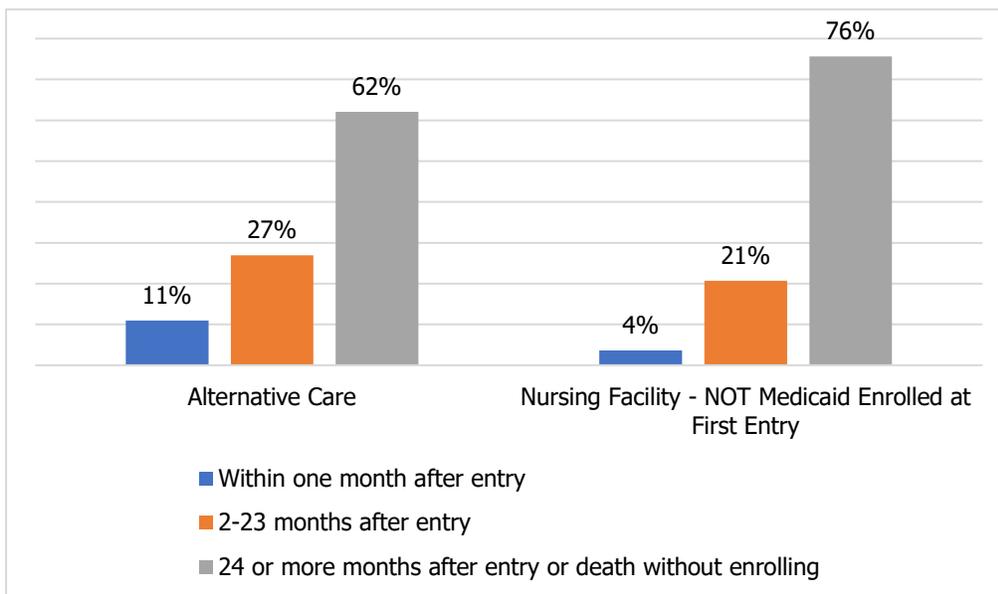


Figure 3.3 Months to Medicaid Enrollment for those Not Medicaid Enrolled at First Entry



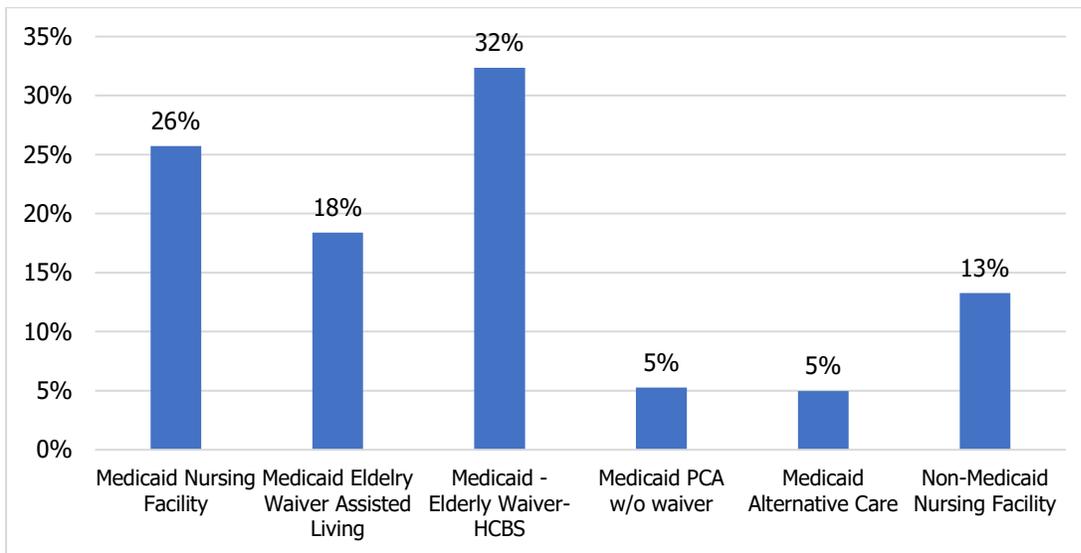
Distribution of LTSS Users Across Programs and Settings

The LTSS users during the baseline period (annual average 2016-2019) were divided among different care settings and Medicaid enrollment status (Figure 3.4). The majority of LTSS users were in residential settings: 26% were nursing facility residents enrolled in Medicaid, 13% were nursing facility residents without Medicaid enrollment, 18% were Medicaid enrollees through an Elderly Waiver in assisted living facilities. Among LTSS users in non-residential settings, 32%

were participating in an Elderly Waiver in a home and community-based setting, 5% had a Personal Care Assistant (PCA) outside of a waiver, and 5% were participating in the Alternative Care waiver program.

We point out again that we did not have data on older people residing in assisted living facilities who were paying privately, nor did we have data on privately provided home and community based LTSS.

Figure 3.4 Average Annual LTSS Users of Care by LTSS Category (2016-2019)

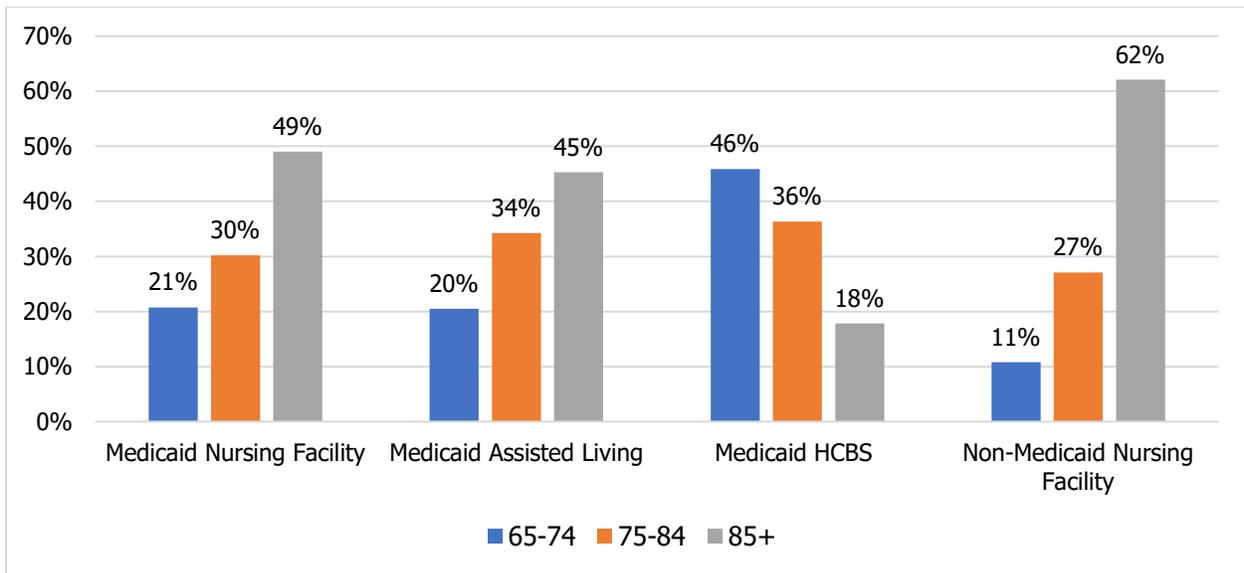


Note: Annual Average = 47,317 LTSS users

Demographic Profile of LTSS Users

The LTSS users in residential settings tended to be older than those participating in Medicaid HCBS, a combination of Elderly Waiver-HCBS and PCA without a waiver (Figure 3.5). The largest percentage aged 85 and older was among nursing facility residents not enrolled in Medicaid (62%), followed by nursing facility residents enrolled in Medicaid (49%), and Medicaid assisted living facility residents (45%). Only 18% of Medicaid HCBS users were aged 85 and older.

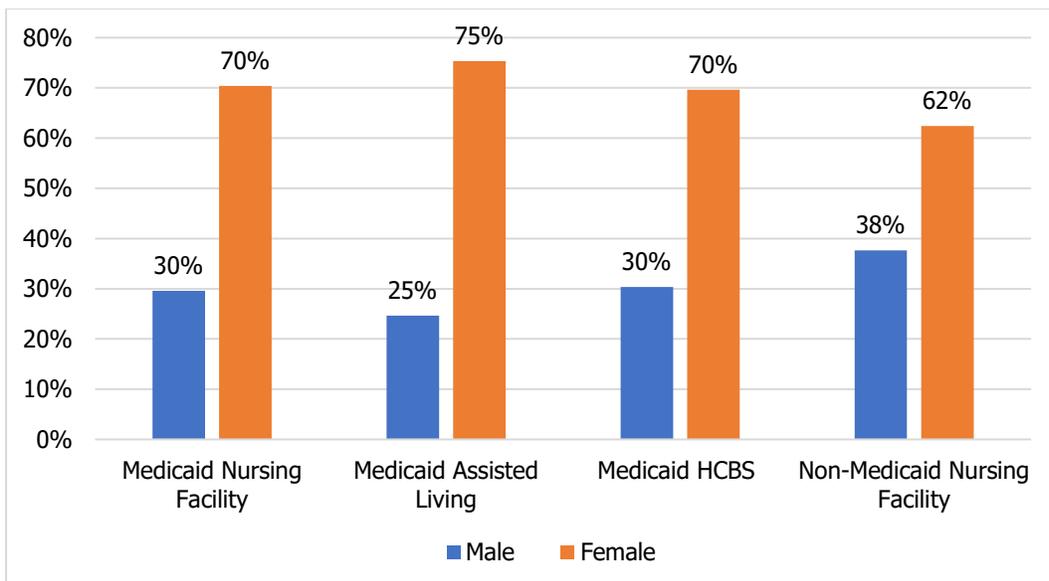
Figure 3.5 Annual LTSS Users of Care by Age (2016-2019)



Note: Medicaid HCBS: Elderly Waiver-HCBS, PCA w/o a waiver, and Alternative Care Waiver

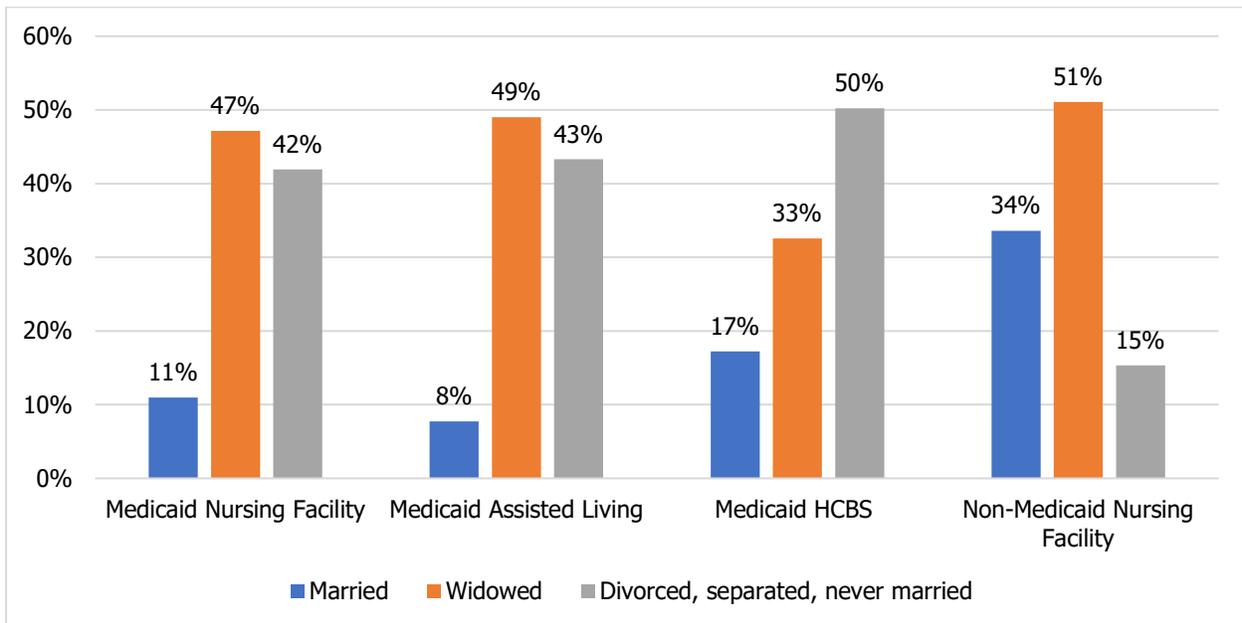
Users of all types of LTSS were predominately female (Figure 3.6) and unmarried (Figure 3.7). People who were widowed made up the largest percentage of LTSS users in all of the settings. High percentages of people enrolled in Medicaid also were either divorced, separated, or never married. The largest percentage of married persons (32%) was among people residing in nursing facilities and not enrolled in Medicaid.

Figure 3.6 Annual LTSS Users of Care by Gender (2016-2019)



Note: Medicaid HCBS: Elderly Waiver-HCBS, PCA w/o a waiver, and Alternative Care Waiver

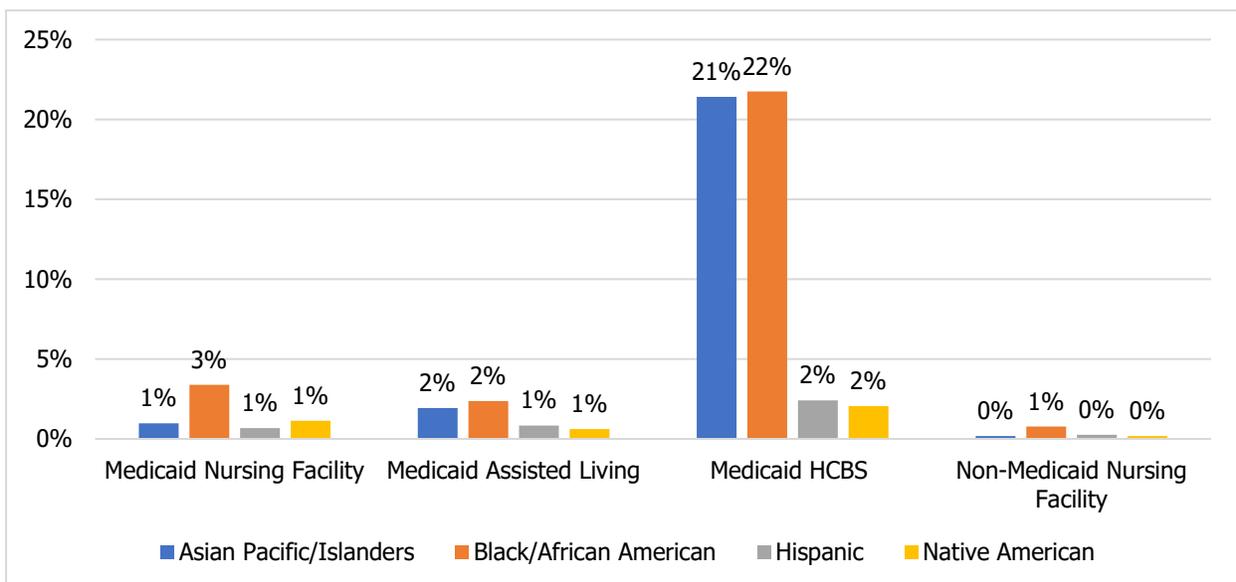
Figure 3.7 Annual LTSS Users of Care by Marital Status (2016-2019)



Note: Medicaid HCBS: Elderly Waiver-HCBS, PCA w/o a waiver, and Alternative Care Waiver

The vast majority of LTSS users in residential settings (97% or higher) were White, non-Hispanic (Figure 3.8). In contrast, nearly half (46%) of Medicaid HCBS users were from other racial/ethnic groups. The largest percentages of people using Medicaid HCBS were Black/African American (22%) and Asian/Pacific Islanders (21%).

Figure 3.8 Annual LTSS Users of Care - Racial/Ethnic Groups (2016-2019)

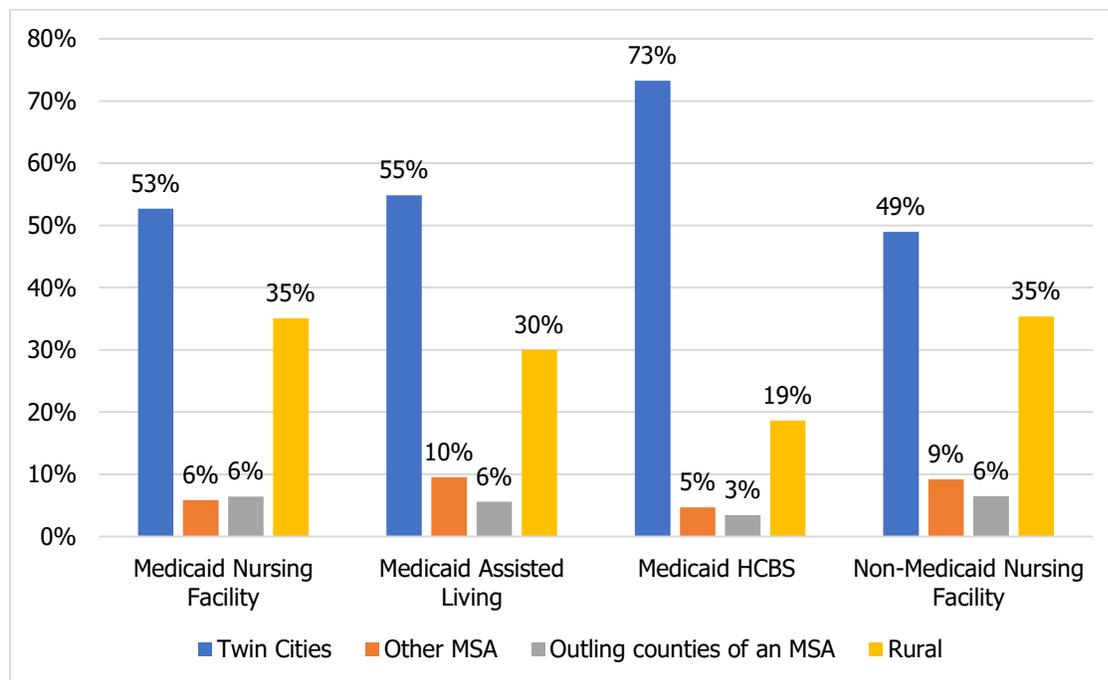


Note: Medicaid HCBS: Elderly Waiver-HCBS, PCA w/o a waiver, and Alternative Care Waiver

The majority of LTSS users were residing in urban counties, and most of these people were in the Twin Cities metro area (Figure 3.9). Nearly three-fourths of Medicaid HCBS users were

residing in the Twin Cities. Only about half of people using residential LTSS were in the Twin Cities (49%-55%), while about one-third (30%-35%) were in rural counties.

Figure 3.9 Annual LTSS Users of Care by Residence (Annually 2016-2019)



Note: Medicaid HCBS: Elderly Waiver-HCBS, PCA w/o a waiver, and Alternative Care Waiver

Profile of LTSS Need -- Dementia/Cognitive Impairment, Behavioral Health Conditions and ADL Dependencies

The users of different types of LTSS varied in the measure of functional need for LTSS¹. People using LTSS in nursing facilities and assisted living facilities were most likely to be suffering from dementia and/or cognitive impairment, with the highest percentages (71%) among assisted living facility residents and Medicaid residents of nursing facilities (70%) (Figure 3.10). Compared to other LTSS users, a much higher percentage of assisted living facility residents also experienced behavioral health conditions (62%). Behavioral health conditions were far more prevalent in people with dementia than among those without dementia (Figure 3.11). Over half (52%) of assisted living facility residents had a combination of dementia/cognitive impairment and behavioral health conditions (Figure 3.12).

As shown in Figure 3.13, the highest average number of ADL dependencies (range 0-8) was among nursing facility residents not enrolled in Medicaid (5.66), followed by nursing facility residents enrolled in Medicaid (4.77). Residents of assisted living facilities had a lower average

¹ ADL Dependency ranges from 0-8, and it measures for need for extensive assistance or total dependence on others in performing 8 activities of daily living: bed mobility, transferring, eating, walking, bathing, dressing, grooming, and toileting. Dementia/Cognitive Impairment includes Alzheimer's or related disorder diagnosis from the Medicaid claims or MDS, or assessed functional cognitive impairment recorded in the MDS or MNChoices NF-LOC screening document. Behavioral Health Conditions are based on assessments recorded in MDS or MNChoices NF-LOC screening document

number of ADL dependencies (3.09), while users of Medicaid HCBS had a lower average number of dependencies (2.76).

Figure 3.10 Annual LTSS Users of Care by Dementia/Cognitive Impairment and Behavioral Health Conditions (Annually 2016-2019)

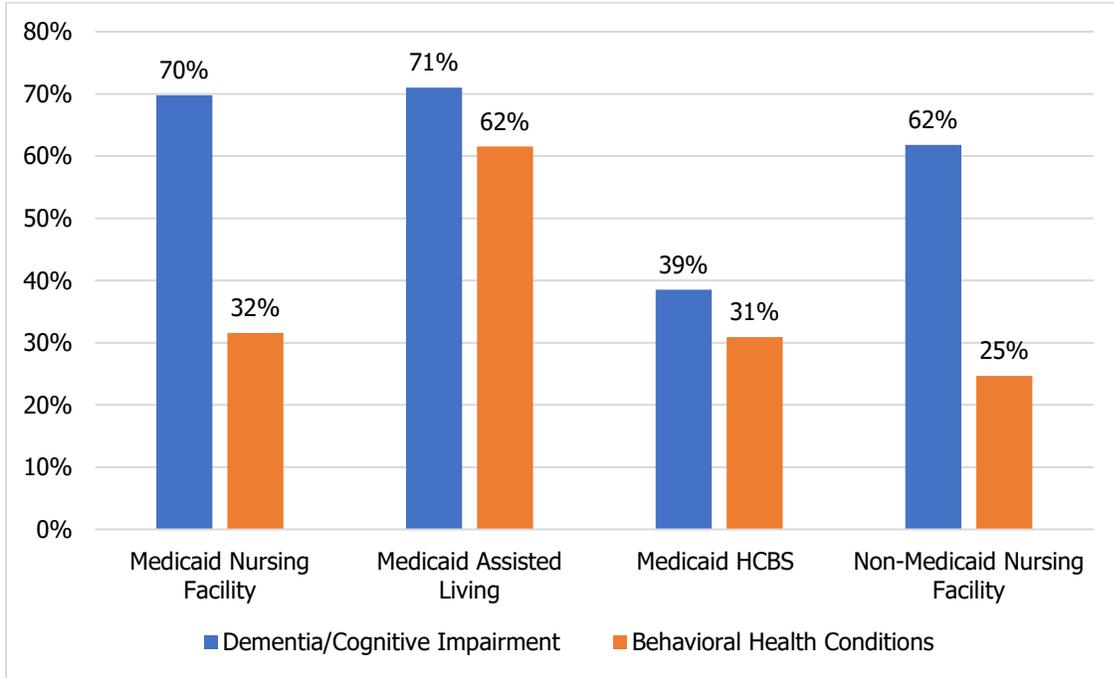


Figure 3.11 Combinations of Dementia/Cognitive Impairment (CI) and Behavioral Health Conditions (Annually 2016-2019)

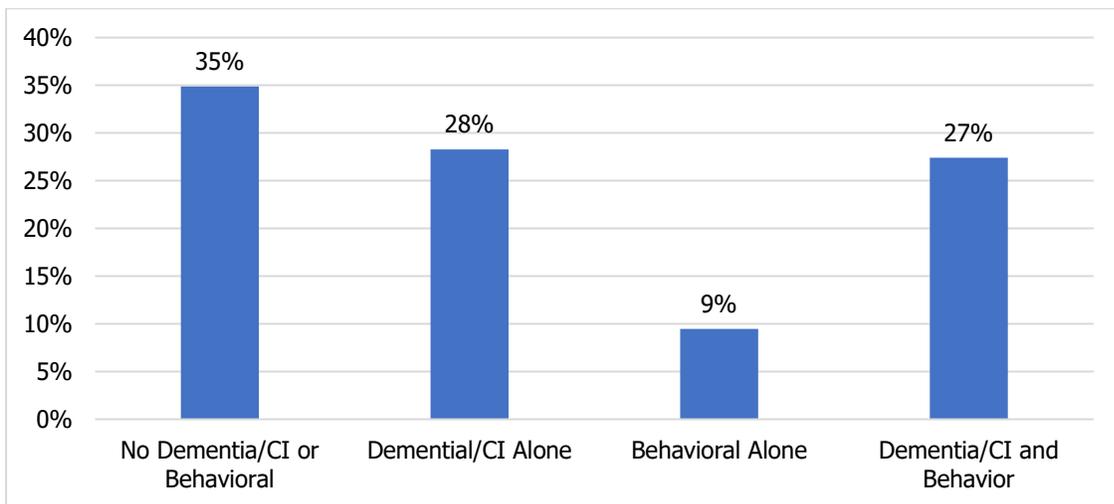


Figure 3.12 Combinations of Dementia/Cognitive Impairment and Behavioral Health Conditions by LTSS Type (Annually 2016-2019)

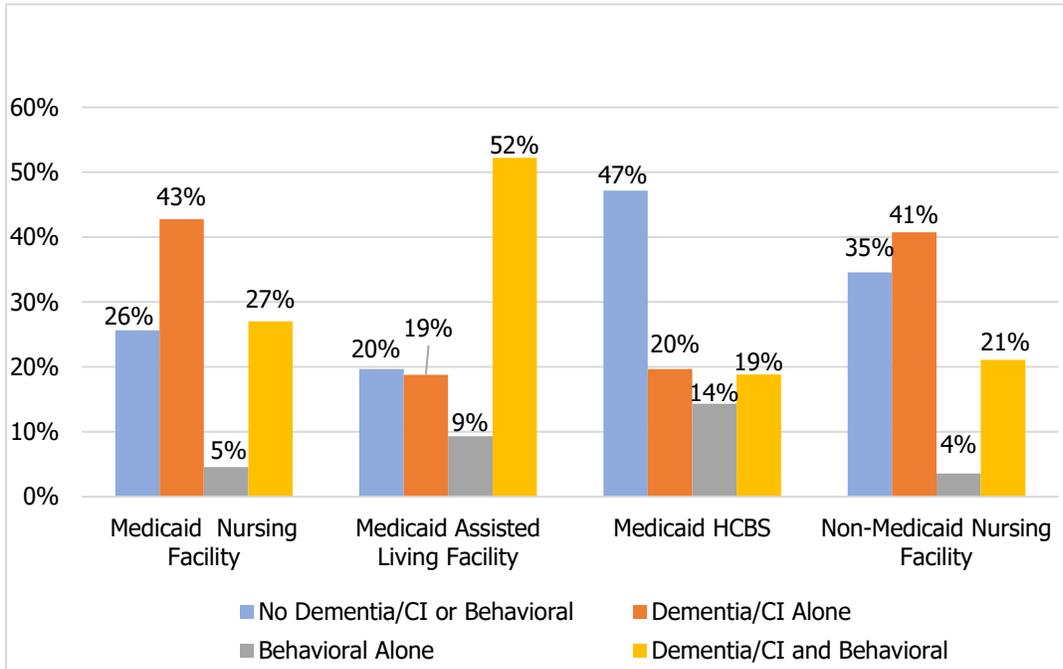


Figure 3.13 Annual LTSS Users of Care by Average Number ADL Dependencies, Range = 0-8 (Annually 2016-2019)

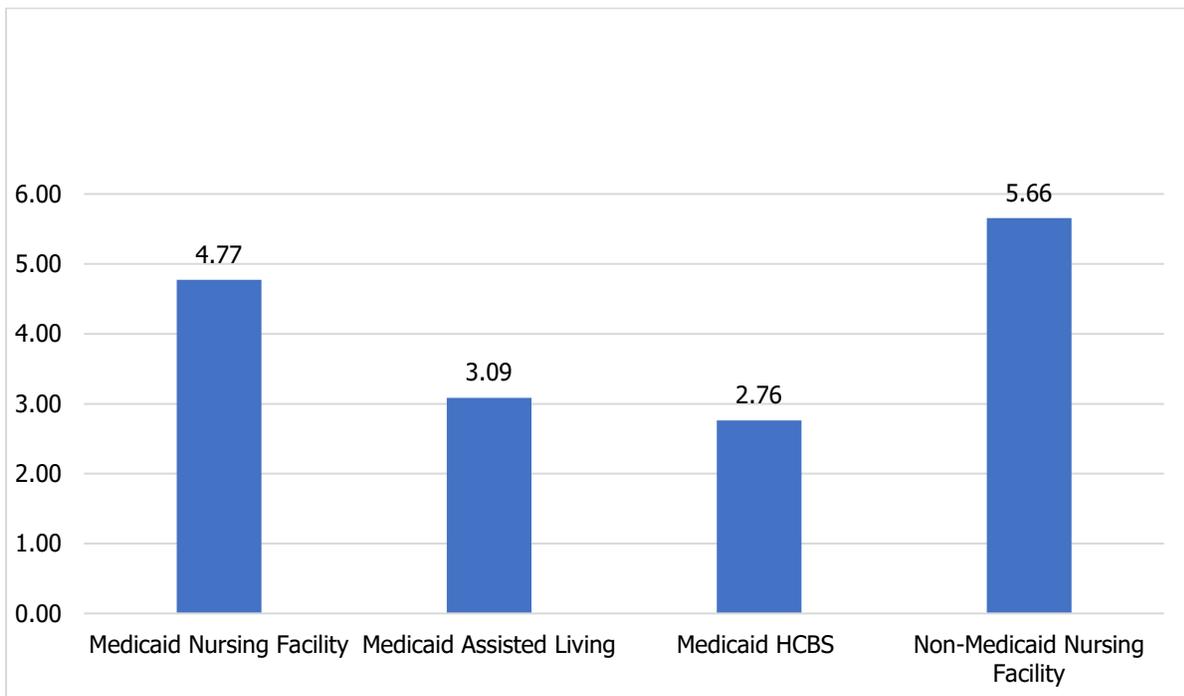


Table 3.2 shows the combinations of dementia/cognitive impairment and ADL dependency. The users of Medicaid HCBS stood out as having the highest percentage of people with 2 or fewer ADL dependencies. Most of these people were absent dementia/cognitive impairment. Residents of assisted living facilities also had next highest percentage of residents with 2 or fewer ADL dependencies, although many of these residents had dementia/cognitive impairment. Nursing facility residents had the highest percentage of residents with 3 or more ADL dependencies, either alone or combined with dementia/cognitive impairment.

Table 3.2 LTSS users by Dementia/Cognitive Impairment, ADL Dependencies, and Type of LTSS

	0-2 ADLs without Dementia	0-2 ADLs with Dementia	3-8 ADLs without Dementia	3-8 ADLs with Dementia	Total
Nursing Facility - Medicaid	11%	17%	19%	52%	100%
Medicaid- Assisted Living	17%	29%	17%	42%	105%
Medicaid- HCBS	35%	16%	27%	22%	100%
Nursing Facility - non-Medicaid	8%	9%	30%	53%	100%
Total	22%	18%	22%	38%	100%
Total Number	10,357	8,450	10,606	17,855	47,268

Chapter 4. The COVID-19 Pandemic and Trends in LTSS from Baseline (2016-2019) through the COVID-19 period (2020-2021)

This chapter addresses the impact of the COVID-19 pandemic on LTSS by examining annual trends in key indicators from the pre-COVID period (2016-2019) through the first two years of the pandemic (2020-2021). Complete data were not available for later years. The key indicators are use of different types of LTSS, demographic characteristics and measures of LTSS need, and mortality rates.

In this chapter we report patterns of LTSS for all nursing facility users, including those with short stays (< 90 days). Most of this group of short stay nursing facility users was excluded from the findings in Chapters 3 and in the projections reported in Chapter 5, because they did not use any LTSS services beyond the short nursing facility stay. We assumed that many of these people entered the nursing facility for recovery or rehabilitation after an acute care episode, and that they were not permanently disabled. The reason for including the short-stay nursing facility residents in the trend analysis is to estimate the impact of COVID-19 on nursing facility use overall and as well as its impact on what we have defined as the LTSS population for our main analysis. The Appendix – Chapter 4 Trends in LTSS Pre-COVID (2018-2019) and COVID Period (2020-2021) presents findings from a detailed analysis of LTSS trends by LTSS categories, demographics, care needs, and mortality.

Trends in New Entrants to LTSS Use by Year

The numbers of new entrants into nursing facilities dropped substantially with COVID-19 both among people enrolled in Medicaid and those not enrolled. New entrants among Medicaid enrollees continued to decline in 2021 while new entrants not enrolled in Medicaid experienced a small recovery in 2021.

People not enrolled in Medicaid comprised the vast majority of new short-stay entrants to nursing facilities (Figure 4.1). The numbers for short-stay entrants for both Medicaid and non-Medicaid enrollees trended downward from 2016-2019 and then dropped sharply in 2020 with the COVID-19 pandemic. The non-Medicaid new entrants rose somewhat in 2021, while the new entrants enrolled in Medicaid continued to decline.

Among nursing facility entrants with stays of 90 days and longer, the non-Medicaid numbers trended downward through 2020, but then rose in 2021 (Figure 4.2). In contrast, the new entrants enrolled in Medicaid, who remained in the facility 90 days or longer, dropped substantially in 2020 and then continued a decline in 2021.

The number of new entrants to Medicaid HCBS and assisted living facilities also dropped in 2020 with the pandemic (Figure 4.3). The numbers rose again in 2021, particularly among new entrants to Medicaid assisted living facilities where the number of new entrants exceeded prior years. The increases in new entrants to assisted living facilities and HCBS may be among individuals who otherwise would have used nursing facilities pre-COVID 19; however, we have no evidence to support this speculation.

Figure 4.1 Number of New Entries with Short Nursing Facility Stays (< 90 days)

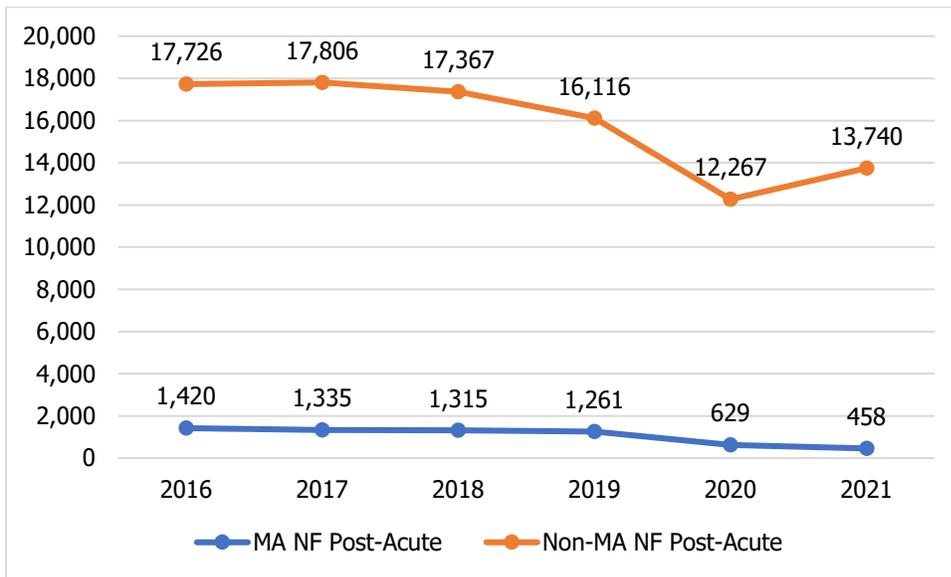


Figure 4.2 Number of New Entries with Nursing Facility Stays 90 Days or Longer

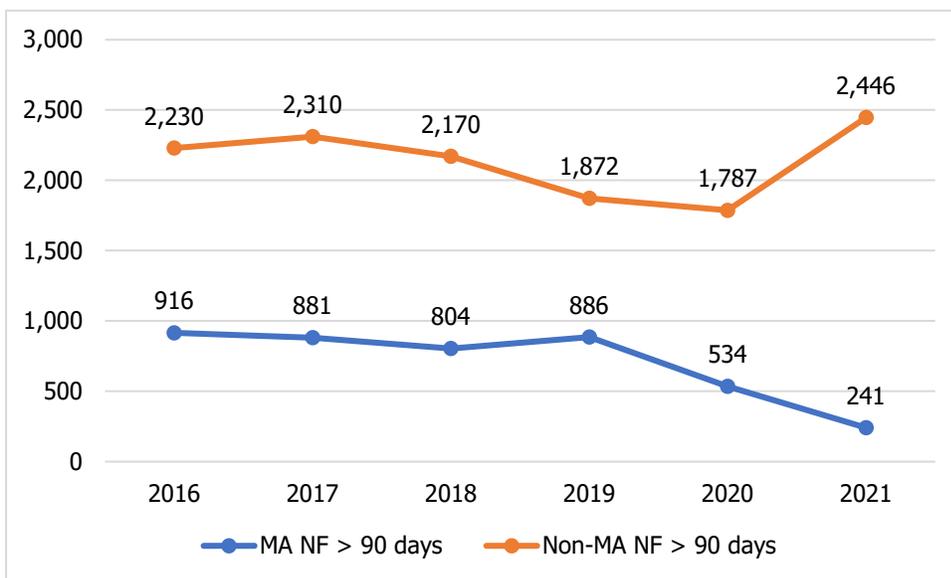
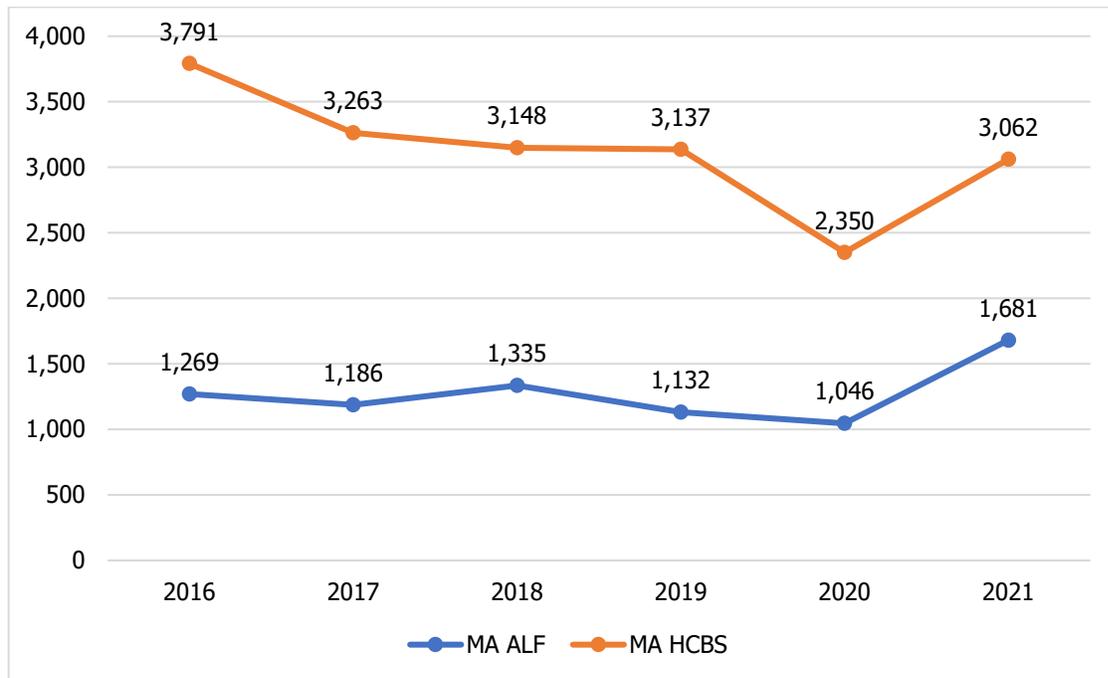


Figure 4.3 Number of New Entries to Medicaid Assisted Living and Medicaid HCBS



Trends in Annual LTSS Users by Type of LTSS

The annual number of nursing facility users enrolled in Medicaid displayed a downward trend from 2016-2019 that accelerated in 2020 and 2021 (Figure 4.4). This downward trend is indicative of the decline in new nursing facility entrants among Medicaid enrollees combined with their shorter stays in 2020 and 2021. The numbers of non-Medicaid nursing facility users stayed steady both before and during the pandemic. The numbers of annual users of Medicaid HCBS and assisted living facilities showed only a small decline between the pre-COVID and COVID periods (Figure 4.5).

Figure 4.4 Number of Annual Nursing Facility Residents with Stays of 90 days or More

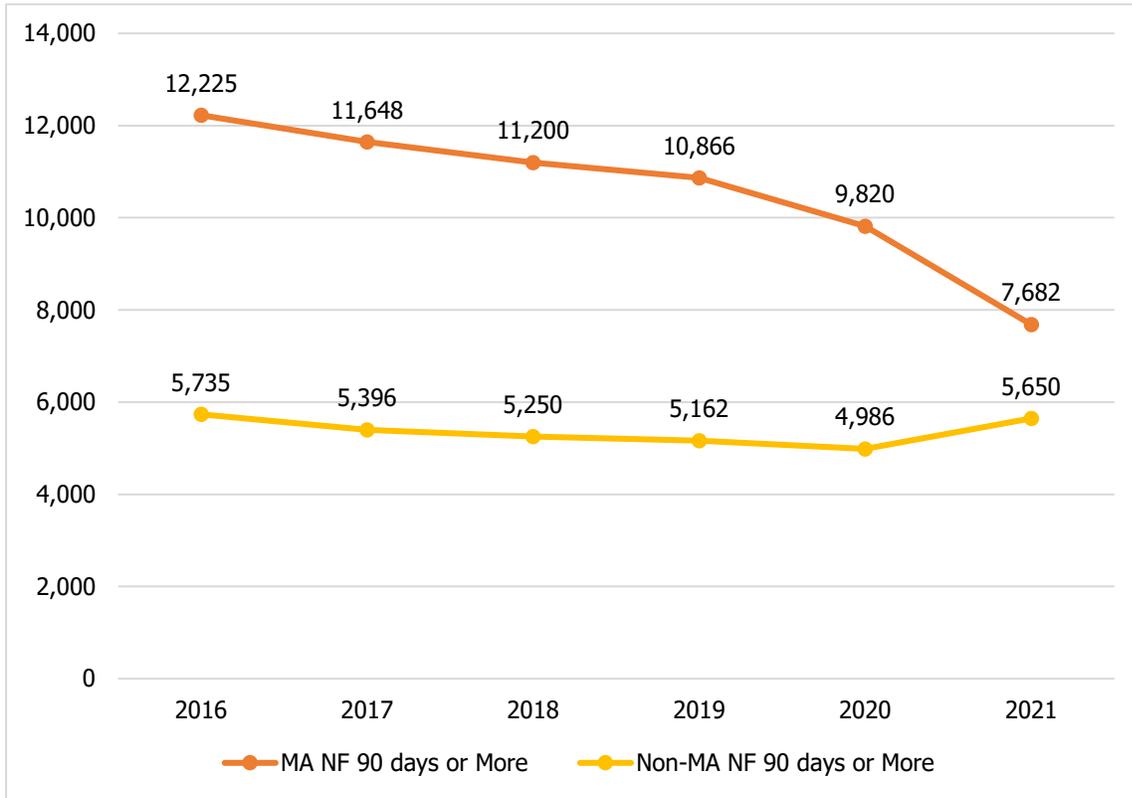
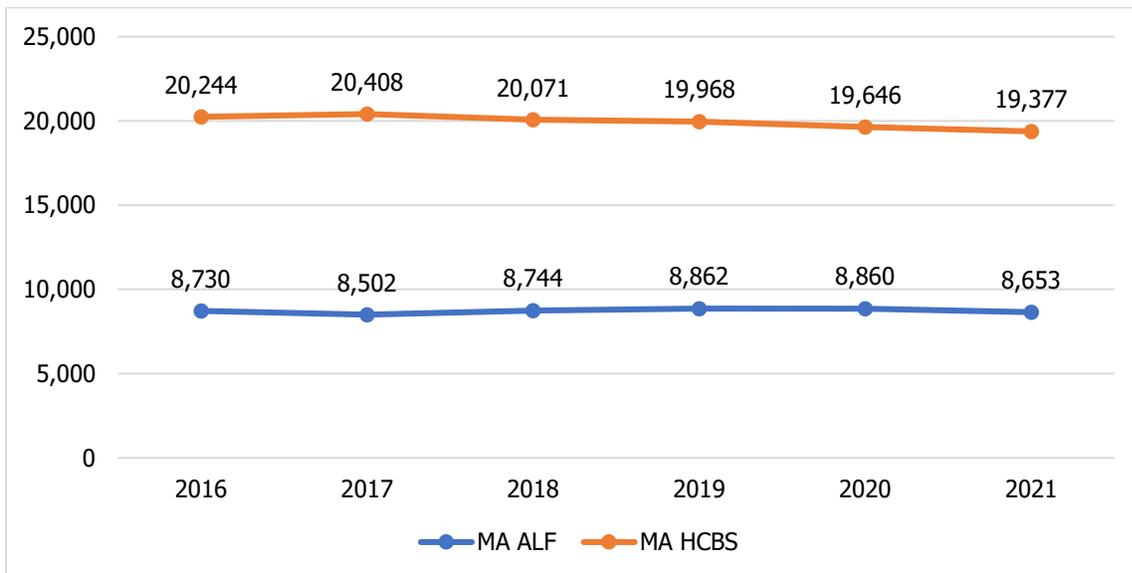


Figure 4.5 Number of Annual Medicaid Assisted Living and Medicaid HCBS Users



Trends in Characteristics of LTSS Users

Although the numbers of new LTSS entries changed over time their characteristics remained very similar between the pre-COVID and COVID periods (Table 4.1). Most new entries to LTSS were above the age of 85, female, unmarried (widowed, divorced, separate, or never married), White non-Hispanic, and residing in the Twin Cities metro area. About three of five had dementia/cognitive impairment and one-fourth had behavioral health conditions. About seven in ten were dependent in 3 or more activities of daily living (out of 8 total).

Table 4.1 Trends in Characteristics of New LTSS Entries by Year

Characteristic at Initial Entry	2016	2017	2018	2019	2020	2021
Number Entering	27,352	26,781	26,139	24,404	18,613	21,628
Age						
65-74	25%	24%	25%	26%	26%	27%
75-84	34%	34%	34%	35%	34%	35%
85 and older	41%	42%	41%	39%	40%	38%
Total	100%	100%	100%	100%	100%	100%
Gender						
Male	39%	39%	40%	41%	42%	42%
Female	61%	61%	60%	59%	58%	58%
Total	100%	100%	100%	100%	100%	100%
Marital Status						
Married	36%	37%	38%	38%	37%	38%
Widowed	41%	40%	39%	38%	37%	36%
Separated/divorced	14%	13%	14%	15%	15%	15%
Never Married	9%	9%	9%	10%	11%	11%
Total	100%	100%	100%	100%	100%	100%
Race/Ethnicity						
Asian / Pacific Islanders	2%	2%	2%	2%	2%	2%
Black/African American	3%	3%	3%	3%	3%	4%
Hispanic	1%	1%	1%	1%	1%	1%
Native American	1%	1%	1%	1%	1%	1%
Multiple race/ethnicity	0%	0%	0%	0%	0%	0%
White	93%	94%	94%	93%	93%	92%
Total	100%	100%	100%	100%	100%	100%
County of Residence						
Twin Cities	61%	62%	62%	63%	62%	63%
Other MSA	8%	8%	8%	8%	7%	7%
Outlying county of an MSA	6%	6%	6%	6%	6%	6%
Rural	25%	24%	25%	23%	25%	24%
Total	100%	100%	100%	100%	100%	100%
Dementia and/or Cognitive Impairment						
Yes	39%	38%	38%	37%	40%	37%
No	61%	62%	62%	63%	60%	63%
Total	100%	100%	100%	100%	100%	100%

Characteristic at Initial Entry	2016	2017	2018	2019	2020	2021
Behavioral Health Conditions						
Yes	21%	21%	21%	21%	23%	24%
No	79%	79%	79%	79%	77%	76%
Total	100%	100%	100%	100%	100%	100%
Number of ADL Dependencies (Range= 0-8)						
0-2	32%	30%	30%	31%	28%	30%
3-8	68%	70%	70%	69%	72%	70%
Total	100%	100%	100%	100%	100%	100%

Trends in Twelve-Month All-Cause Mortality for LTSS Cohorts beginning in March 2018-2021

The March LTSS cohorts were followed for 12 months (through February of the following year) to determine all-cause mortality rates (Table 4.2). The excess deaths, or differences in mortality between the pre-COVID-19 and COVID-19 periods, could be attributed to COVID-19 either directly or indirectly.

Nursing Facility Residents - The rate of mortality among nursing facility residents, already higher than for Medicaid assisted living facility residents and HCBS participants, rose substantially in 2020 during the first 12 months of the COVID-19 pandemic (Table 4.2). Mortality rates rose 21% from 335 deaths/1000 population in 2019 to 406/1000 in 2020, then declined to 326/1000 in 2021 to a level similar to the years before the pandemic. Mortality rates were highest among nursing facility residents not enrolled in Medicaid who had stays of more than 90 days at the beginning of the cohort. Their mortality rate increased 24% from 363/1000 in 2019 to 449/1000 in 2020. Mortality among Medicaid residents with long stays experienced an increase of 23% from 324/1000 in 2019 to 400/1000 in 2020.

Medicaid Assisted Living Residents - Residents of assisted living facilities had lower mortality rates than nursing facility residents but much higher mortality rates than participants in the Elderly Waiver – HCBS, Alternative Care, and PCA without a waiver (Table 4.2). Following the same pattern as among nursing facility residents, mortality rates for assisted living resident rose by 23% from 197/1000 in 2019 to 243/1000 in 2020, and then declined to a pre-pandemic level of 207/1000 in 2021.

Medicaid HCBS Participants - Mortality rates for participants in the Elderly Waiver-HCBS, Alternative Care, and PCA without a waiver were relatively low during the pre-pandemic period, yet their percentage increase was similar to the other LTSS categories. Their mortality increased 19% from 68/1000 in 2019 to 81/1000 in 2020. Unlike the other categories, their mortality rates did not return to a pre-pandemic level in 2021; the rate remained at 81/1000.

Table 4.2 Mortality over 12 Months for Cohorts Beginning in March of 2018-2021 by LTSS Categories

	Deaths				Deaths/1000			
	2018	2019	2020	2021	2018	2019	2020	2021
MA NF LOS 0-90 Days	396	402	462	213	320	321	356	263
MA NF LOS 91+ Days	3,329	3,426	4,058	2,442	309	324	400	309
Non-MA NF LOS 0-90 Days	484	455	499	542	342	339	365	351
Non-MA NF LOS 91+ Days	1,676	1,663	1,961	1,459	357	363	449	364
Medicaid Assisted Living	1,835	1,891	2,445	1,941	195	197	243	207
Elderly Waiver - HCBS	1,012	1,096	1,381	1,373	62	65	79	78
Alternative Care	225	213	252	246	90	87	97	98
PCA w/o Waiver	187	190	203	161	74	74	84	81
All NF	5,885	5,946	6,980	4,656	325	335	406	326
Medicaid Assisted Living	1,835	1,891	2,445	1,941	195	197	243	207
EW-HCBS, AC, or PCA	1,424	1,499	1,836	1,780	67	68	81	81
All LTSS	9,144	9,336	11,261	8,377	187	189	226	183

Note: LOS: length of stay

Chapter 5. Base Case Current and Future Utilization and Payments for LTSS

In projecting Base Case future utilization and payments for LTSS, we draw on population projections for older Minnesotans from the Minnesota State Demographic Center, data on monthly per user Medicaid payments for LTSS services from the Medicaid MMIS, Medicaid nursing facility rates from DHS administrative sources, and patterns of LTSS utilization over the baseline period 2016-2019. The projection methods are described in Chapter 2, Study Methods, and in the Appendix - Chapter 5 Baseline Projections. Summary information on projected LTSS use and payments is presented in this chapter, while detailed figures are contained in the Appendix - Chapter 5.

There is a degree of uncertainty about any future projections, particularly in a system as dynamic as LTSS. In this chapter we present results from a straightforward base case analysis resting on a series of simplifying assumptions. The simulations in Chapter 6 address some of the uncertainty inherent in forecasting the future, particularly from a statistical perspective.

Simplifying Assumptions

Before presenting findings from the projections, we list simplifying assumptions regarding the future use of care and costs with the Base Case scenario. These assumptions make the projections less complex and more transparent, yet they also represent study limitations.

- Rates of LTSS service use during the baseline period, i.e., numbers of people using each LTSS service and months of service use/person, are assumed to follow the same patterns in the future. The projections do not consider potential shifts in service use between LTSS categories, e.g., from nursing facility to assisted living facility or other HCBS waiver services.
- The baseline projections rely on patterns of care prior to the COVID-19 pandemic. They assume that utilization and payments for LTSS will return to pre-COVID patterns.
- Age is the only demographic characteristic affecting future use of LTSS. Population projections by gender, race, marital status, or county of residence are not considered in the projections.
- Rates of disability, economic status, and availability of family or other private means of support are assumed to remain the same for successive cohorts.
- Medicaid payments for LTSS services, which depend on the base-line rates of service use and payment rates, are also assumed to follow the same patterns in the future, allowing for inflation adjustments.
- Payment rates for LTSS services are assumed to increase by 2.5% per year. This annual inflation rate was selected arbitrarily to represent a modest increase in LTSS costs over the next decade. Alternative inflation rates could be applied to the unadjusted figures in Table A5 to arrive at alternative payment projections.

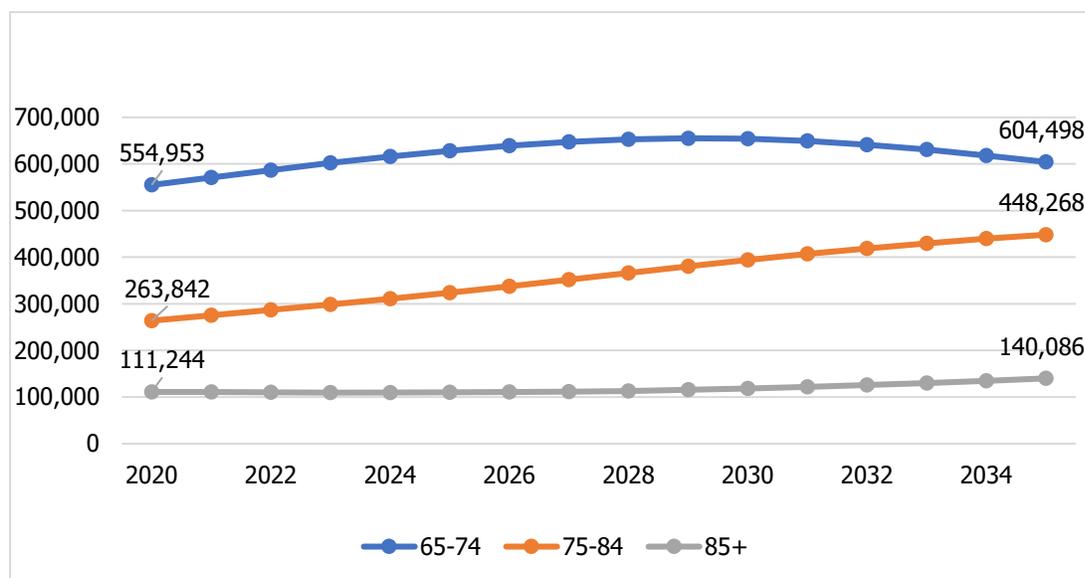
Demographic Projections and Baseline LTSS Utilization and Payments

The starting figures for the Base Case projections were the demographic projections by age group (65-74, 75-84, and 85 and older) and mean monthly Medicaid payments for LTSS per user and mean number of months of LTSS from the Baseline period 2016-2019. The 2016-2019 period was chosen because it contained the most accurate information, un-affected by

data problems that could have arisen during 200-2021, and because we wanted to test a Base Case scenario that LTSS utilization and payments would return to pre-COVID patterns. The simulations in Chapter6 test alternative scenarios incorporating the COVID experience.

Figure 5.1 shows projected annual growth for the Minnesota older population by age categories from 2020-2035. The highest growth rate is in the 75-84 age category, who are members of the “baby boom” generation aging into their late seventies and early eighties. The numbers in the 65-74 age category are projected to level off and decline slightly from 2030 to 2035. The 85 and older age group, which steadily increases in size over the period, will reach its peak in subsequent years when the baby boom generation ages into their late eighties. Even modest growth in the 85 and older age group has implications for future LTSS use and payments because people in this age group have the highest rate of LTSS use.

Figure 5.1 Projections - Total Minnesota Population by Age Categories



The mean monthly Medicaid payments per LTSS user for the baseline period are displayed in Figure 5.2. The figures range from \$6,084 for nursing facilities to \$143 for access services. The Medicaid payment rate is lower than the average monthly charge for nursing facility care because the Medicaid payment is reduced by the resident’s share of the monthly charge. Figure 5.3 shows the total annual Medicaid payments for LTSS during the year. Since nursing facility care is so expensive and nursing facilities are so heavily used, the total payments for nursing facilities tower above the other LTSS services.

Figure 5.2 Mean Medicaid Payments / Month / User by LTSS Service Annually for Years 2016-2019

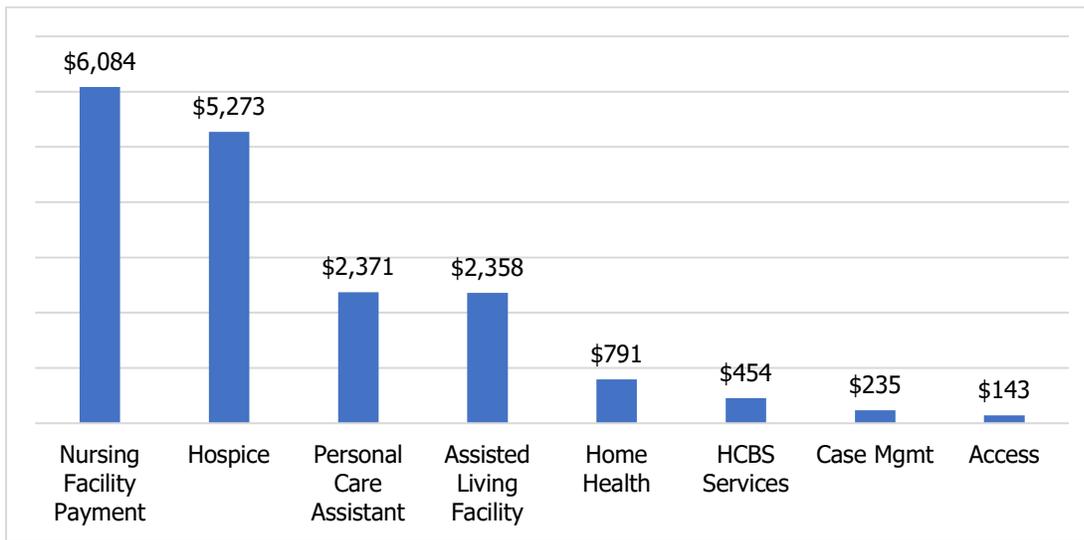
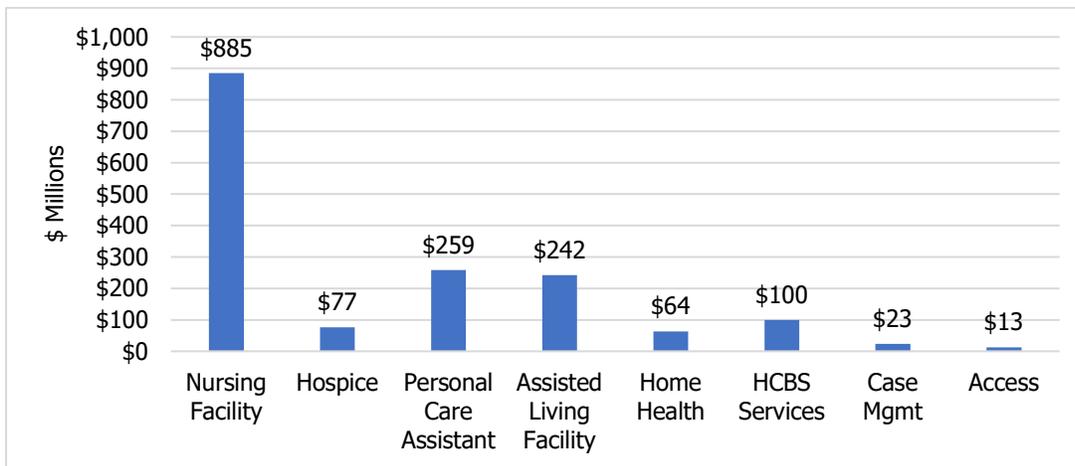


Figure 5.3 Total Annual Medicaid Payments (\$ Millions) (2016-2019)



Base Case Projections of the Number of People Using LTSS Services Annually by Age Group, 2023-2035

The total number of people using any LTSS annually under the Base Case is projected to increase by 26% from 51,870 in 2023 to 65,343 in 2035 (Figure 5.4). As shown in Figure 5.5, the largest projected increase is in the 75-84 age group (17,681 to 26,548), followed by the 85 and older age group (16,470 to 21,000). The number of people in the 65-74 age group is projected to increase only slightly (17,719 to 17,794).

Because users of residential care are on average older than users of home and community-based services, the number of residential care users will increase more rapidly as the LTSS population ages (Figure 5.6-Figure 5.9). The percentage increases between 2023 and 2035 range from 22% for use of personal care assistants to 31% for use of nursing facilities by people not enrolled in Medicaid and 29% for use of nursing facilities by people enrolled in Medicaid (Table 5.1). The largest absolute increases in projected increases are for Medicaid

enrollees using nursing facilities (19,388 to 25,015), non-Medicaid users of nursing facilities (14,325 to 18,724), and Medicaid enrollees using assisted living facilities (13,058 to 16,708). Smaller yet still substantial increases are projected for users of personal care assistants (11,690 to 14,268) and other home and community-based services (18,108 to 22,593). The numbers using access and case management services, as well as home health and hospice are also projected to grow steadily with the aging of the population. The Appendix - Chapter 5 contains details of the number of users per year by age and LTSS service.

Figure 5.4 Projected Total Number of Annual LTSS Users

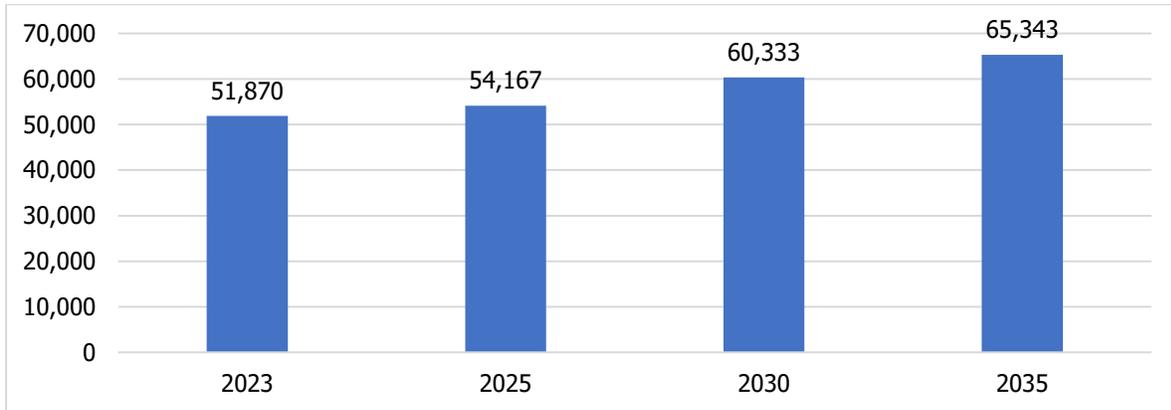


Figure 5.5 Projected Total Number of Annual LTSS Users by Age

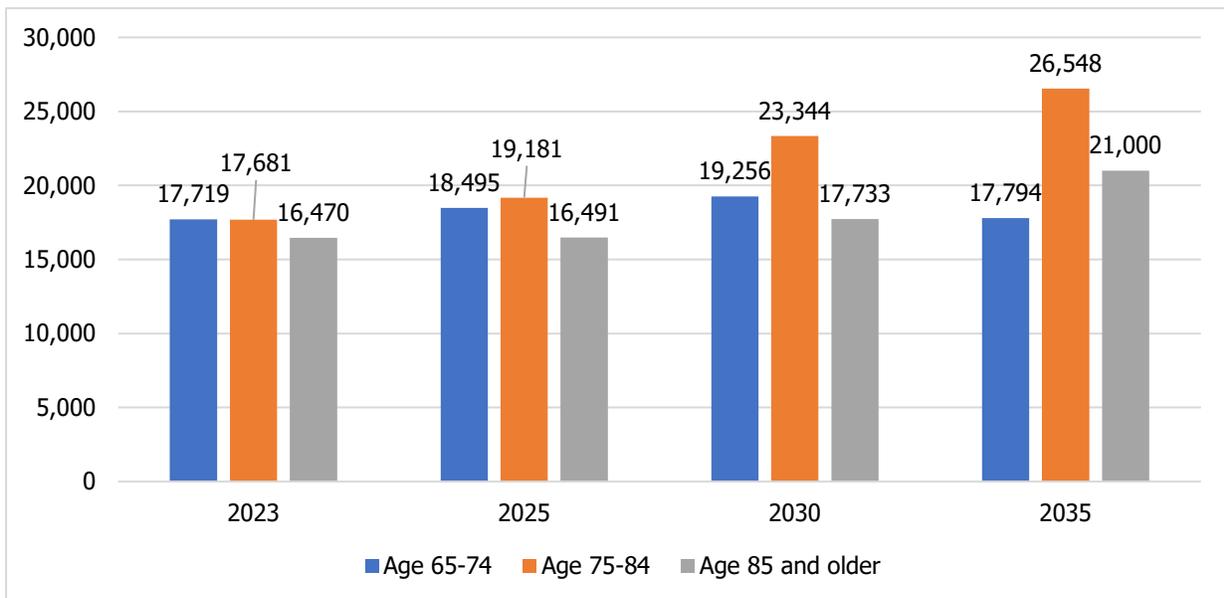


Figure 5.6 Projected Annual Users of Nursing Facilities and Assisted Living Facilities by Year

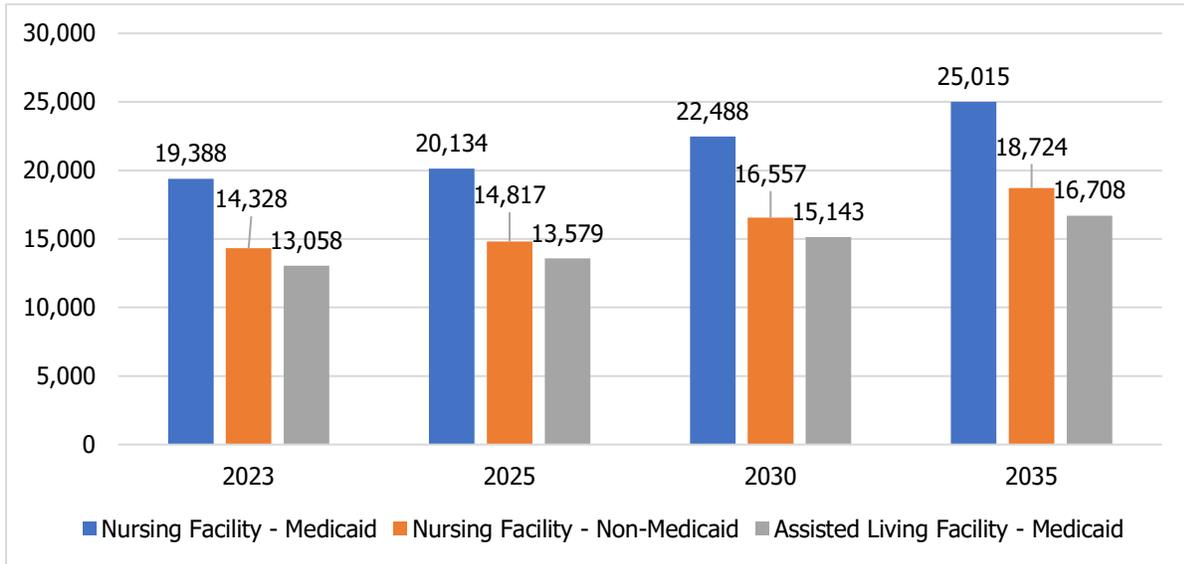
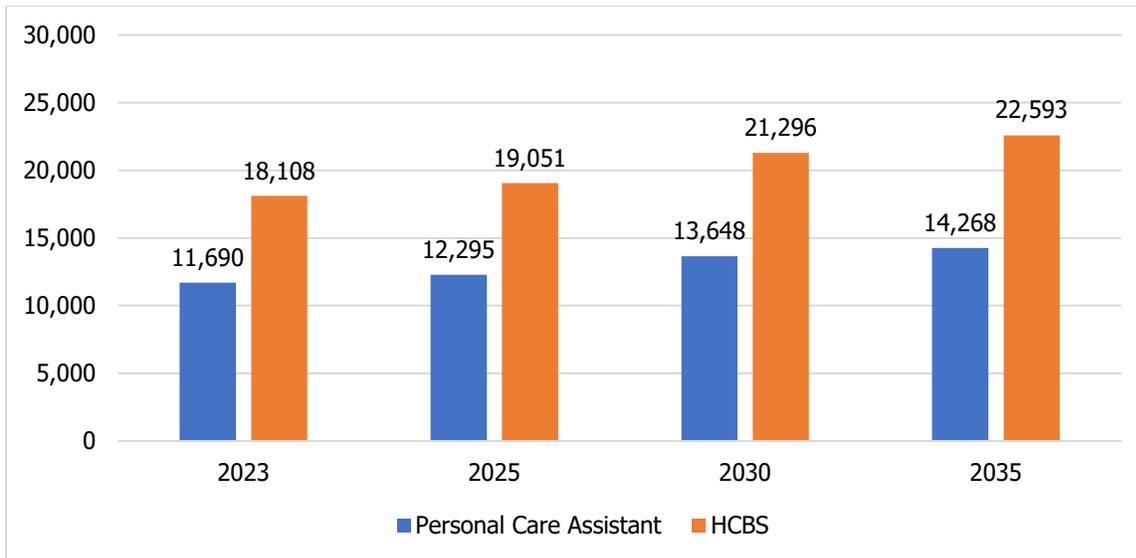


Figure 5.7 Projected Annual Users of Personal Care Assistant or Other Home and Community-Based (HCBS) Services by Year



Note: HCBS: adult day services, chore, home meals, homemaker, and Consumer-Directed Community Supports

Figure 5.8 Projected Annual Users of Case Management or Access Services by Year

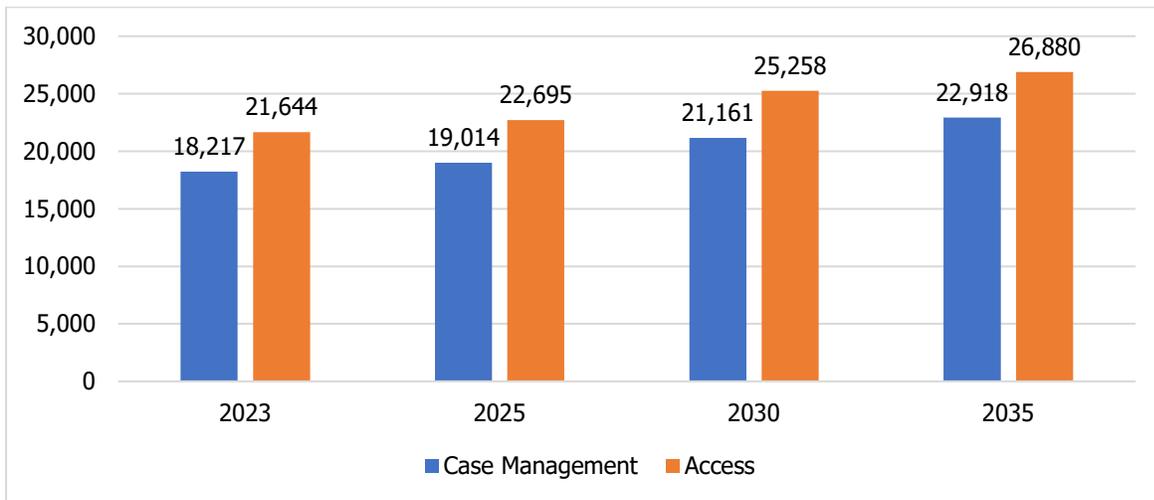
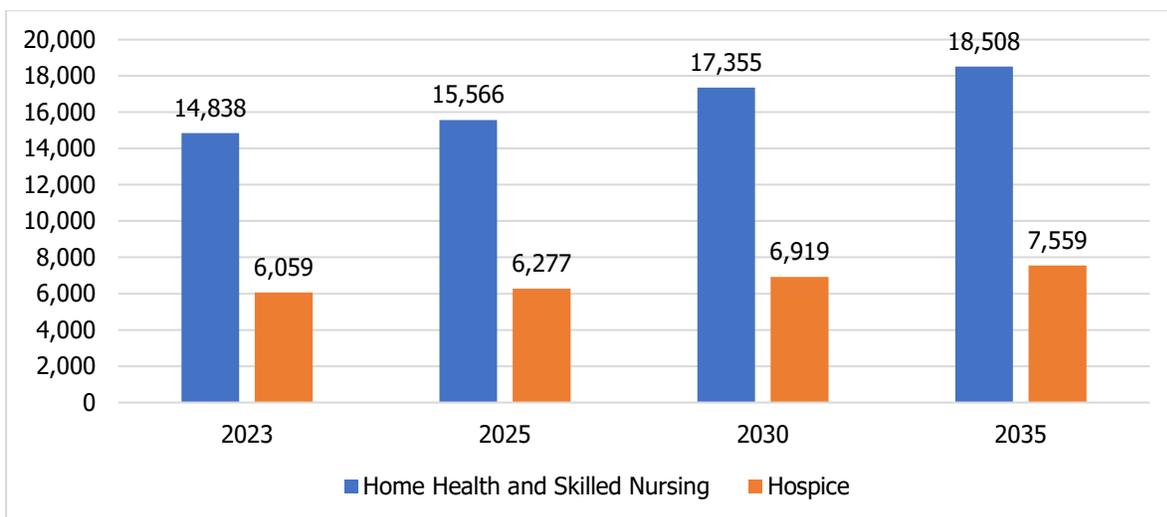


Figure 5.9 Projected Annual Users of Home Health and Skilled Nursing or Hospice by Year



Base Case Projections for Total Annual Payments for LTSS Services

The total Medicaid payments for LTSS under the Base Case are projected to increase from \$1,977 million in 2023 to \$3,379 million in 2035 (Figure 5.10), representing a 71% increase. Between 2025 and 2035, payments are projected to grow by 56%. As shown in Figure 5.11 and Table 5.1, Medicaid payments for nursing facility care are projected to increase by 74% from \$1,103 million in 2023 to \$1,758 million in 2035. Medicaid payments for assisted living facility care are projected to increase by 72% from \$315 million to \$517 million. Increases in other LTSS payments from 2023 to 2035 range from 64% to 68%. The projected increases are \$302 to \$520 million for personal care assistants, \$113 to \$190 million for other HCBS services, \$30 to \$51 million for case management, \$17 to \$28 million for access services, \$80 to \$134 million for home health and skilled nursing, and \$107 to \$180 million for hospice care.

Figure 5.10 Projected Total Annual Medicaid Payments (\$ Millions, 2.5% annual inflation)

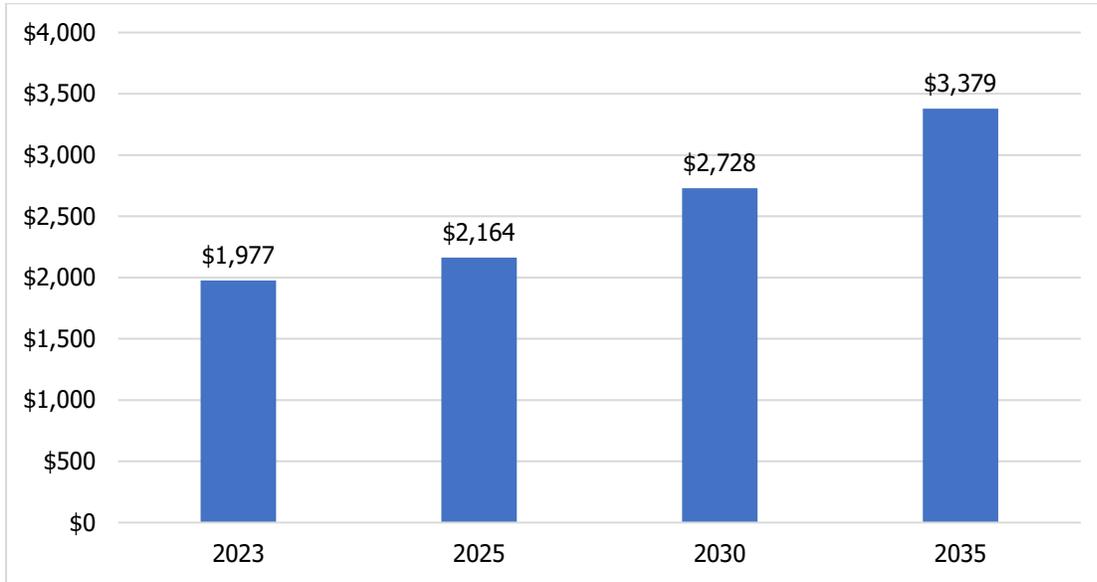


Figure 5.11 Projected Medicaid and Payments for Nursing Facilities and Assisted Living Facilities (\$ Millions, 2.5% annual inflation)

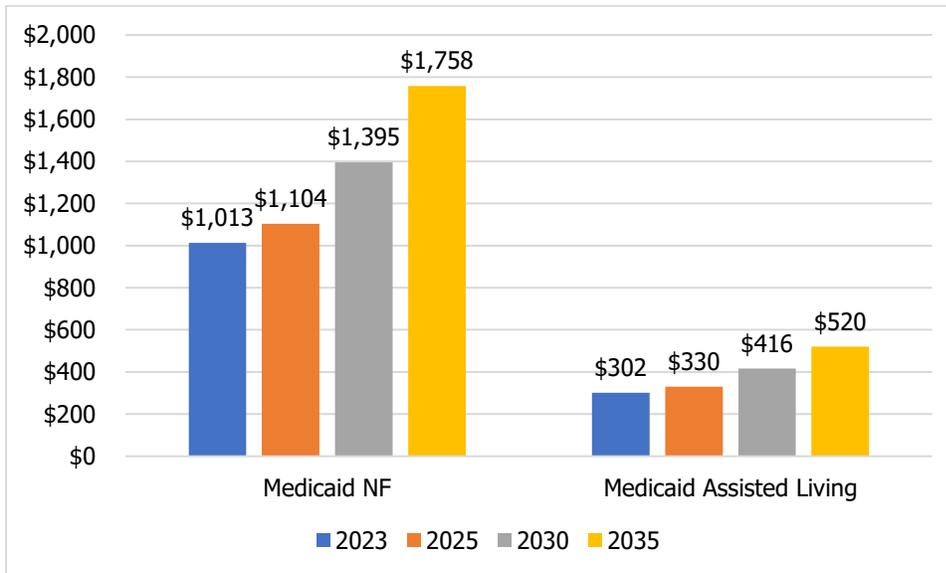
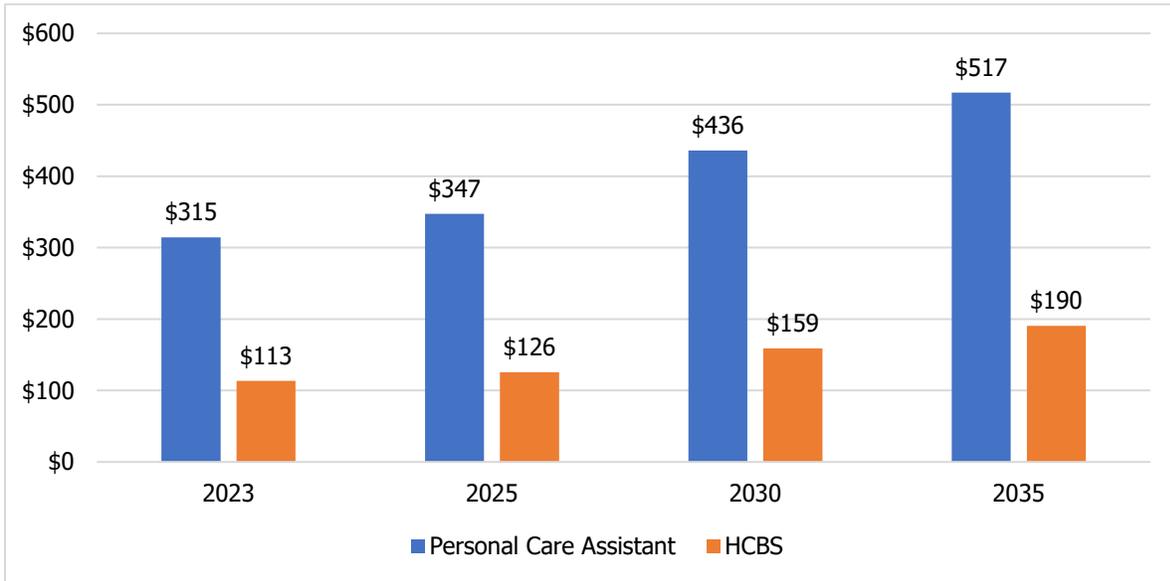


Figure 5.12 Projected Medicaid Payments for Personal Care Assistant and other HCBS (\$ Millions, 2.5% annual inflation)



Note: HCBS: adult day services, chore, home meals, homemaker, and Consumer-Directed Community Supports

Figure 5.13 Projected Medicaid Payments for Case Management or Access Services (\$ Millions, 2.5% annual inflation)

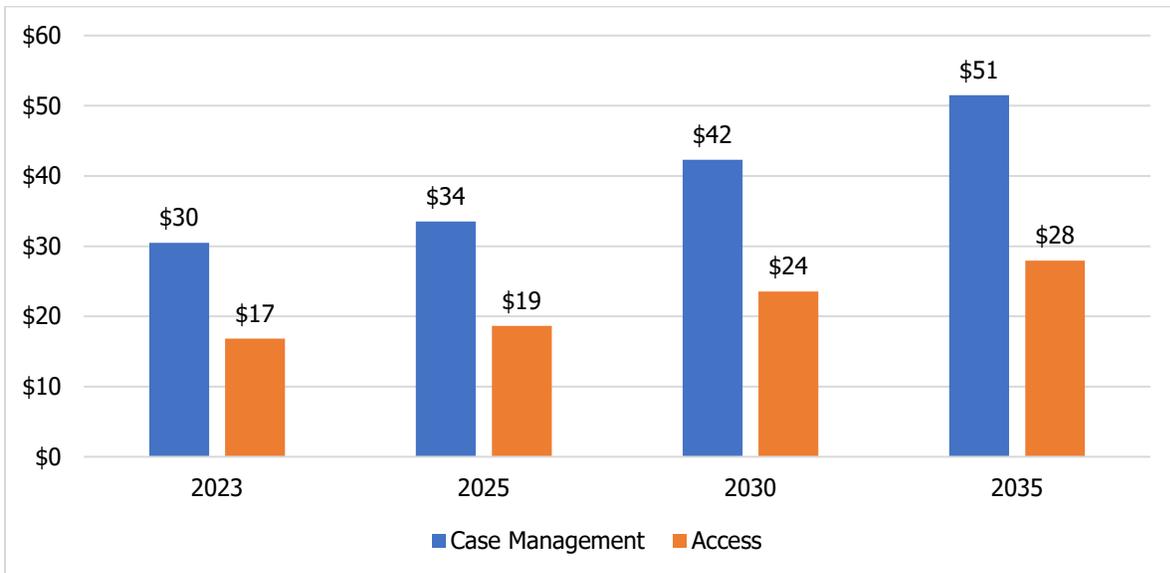


Figure 5.14 Projected Medicaid Payments for Home Health or Hospice (\$ Millions, 2.5% annual inflation)

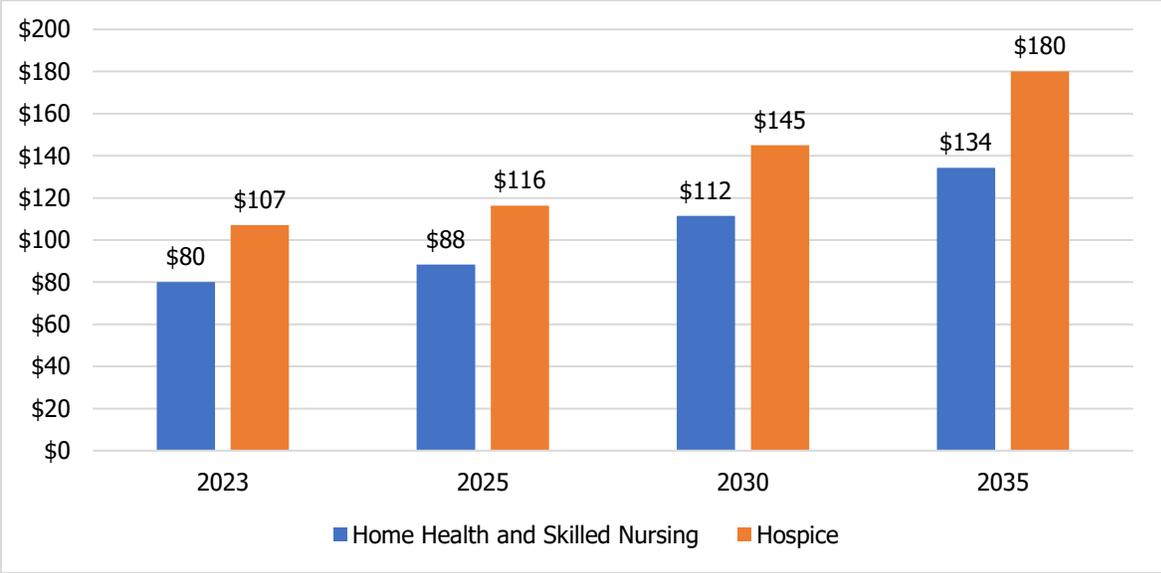


Table 5.1 Percentage Increases from 2023 to Each Future in Use and Payment for LTSS

Year	Nursing Facility - Non-Medicaid	Nursing Facility - Medicaid	Assisted Living Facility	Personal Care Assistant	HCBS	Case Mgmt.	Access	Home Health & Skilled Nursing	Hospice
LTSS Users									
2025	3%	4%	4%	5%	5%	4%	5%	5%	4%
2030	16%	16%	16%	17%	18%	16%	17%	17%	14%
2035	31%	29%	28%	22%	25%	26%	24%	25%	25%
LTSS Payments									
2025	n/a	9%	9%	10%	11%	10%	11%	10%	9%
2030	n/a	37%	38%	39%	40%	39%	40%	39%	35%
2035	n/a	76%	72%	64%	68%	69%	66%	68%	68%

Note: payment projections are not available for users of nursing facilities who are not Medicaid enrolled.

Chapter 6. Micro-Simulation

Introduction

In order to test underlying assumptions behind the projected LTSS growth in usage and dollars, it was decided to utilize microsimulation models to test “what if” analyses. A simulation model developed specifically for this project was used to simulate LTSS use and payments for cohorts of new entrants into LTSS in future years (2025-2029, 2030-2034, and 2035-2039). For this round of assumption testing three scenarios were simulated:

1. A Base Case with a return to pre-COVID rates of total LTSS use;
2. COVID-19-related decline in rates of total LTSS use coupled with a shift away from nursing facility to other type of LTSS;
3. Base Case rates of total LTSS use combined with a shift away from nursing facility use.

All three scenarios resulted in projected increases in total Medicaid payments between periods. For example, Base Case payments were projected to rise by 53% from \$2,887 million for the 2025-2029 cohort to \$4,423 million for the 2035-2039 cohort. Compared to the Base Case, the decline in total LTSS usage rates associated with COVID-19 had a significant impact on simulated total Medicaid payments. Payments were 29% less for the 2025-2029 cohort, 30% less for the 2030-2034 cohort, and 35% less for the 2035-2039 cohort. The third scenario, with a NF-shift but no COVID-related decline in utilization, resulted in only a small change from the Base Case with only a 0.3% - 0.4% difference in payments

If declines in LTSS use associated with COVID-19 and/or the downward trend in nursing facility use were to continue, the result would be much lower growth in projected LTSS use and payments.

We must add notes of caution. At the time of the report, we only had complete data through the first half of 2022, potentially the time when consumer negatives about nursing home use were at their highest. As a result, this analysis may be under-estimating the extent to which overall LTSS use will return to a pre-pandemic level; Medicaid payment reductions may be overestimated.

Also, this analysis may be underestimating the shift away from nursing facility use, which could accelerate in future years if consumer preferences for care settings change, the cost on nursing facility care continues to escalate, and alternatives to nursing facility care become more widely available and acceptable. Other settings, such as assisted living facilities or care in the home, may be more appropriate for people suffering from dementia but not yet having significant ADL dependencies and skilled nursing requirements.

This chapter describes in detail the data and methodology used to create case histories to project the cohort of individuals using LTSS services at any point in a future time period. The purpose of the model is to perform “what if” analyses to test key assumptions underlying LTSS growth projections. It does this by learning the patterns of movement and time spent in different LTSS subgroups to be able to reproduce patterns that mimic the observed patterns for new cohorts of LTSS users.

Simulations Compared to Straight-Line Projections in Chapter 5

The results from the projections in Chapter 5 and simulations in Chapter 6 are not directly comparable because they view LTSS use from different angles. The projections in Chapter 5 are snapshots of use and Medicaid payments for LTSS services individually and in total for selected years. They are estimated with baseline, pre-COVID patterns of LTSS that are projected forward and adjusted for growth in the older population and annual cost inflation. The projections rely on aggregated data; they do not attempt to model individual differences in patterns of LTSS use. On the other hand, the simulations are intended to capture the dynamics of LTSS use and Medicaid payments at the person level over a 5-year time horizon, beginning in selected years.

There are similarities between the simulations and the Chapter 5 projections. The simulations are based on patterns of LTSS during the same pre-COVID baseline period; they rely on the same Medicaid LTSS payment data during the baseline period; and they use the same annual population projections from 2025 to 2035, plus another 5 years from 2035 to 2039.

The differences are notable:

- The simulations capture the dynamics of person-level LTSS, including
 - Movement between settings and programs
 - Medicaid conversion
 - Mortality
- Patterns of LTSS use are adjusted for age, gender, marital status, race/ethnicity, ADLs dementia/cognitive status, and other characteristics of individuals.
- The simulations are over a 5-year period with adjustments for population growth and cost inflation over the 5 years (2025-2029, 2030-2034, 2035-2039). This 5-year horizon provides enough time to simulate the effects of multiple transitions between settings and programs, Medicaid conversion, and mortality.

Despite these differences, both the straight-line projections from chapter 5 and the simulation results from this chapter project similar levels of growth in Medicaid payments over the projection period from 2025 to 2035. For example, the base case from the simulation projects Medicaid payment growth of 53%, while in Chapter 5 payments are projected to grow 56% over the same period (see Figure 5.10 and Table 6.5).

Simulation Details: Data Sample and Variables

Any individual in Minnesota who was 65 or older and received care through the following LTSS categories in the data period (years 2016 through the first six months of 2022) was eligible for inclusion in the sample:

- Medicaid and non-Medicaid nursing facility residents
- Medicaid Elderly Waiver – Residential Services (Assisted Living)
- Medicaid Elderly Waiver – Community (other home and community-based services)
- Alternative Care Waiver
- Medicaid Personal Care Assistant (PCA) provided to people not in an Elderly Waiver program.

Those who participated in the disability waiver programs at any time during the data period were excluded from the study. Individuals having post-acute stays (e.g., 0-29 or 30-90 days) are included along with all nursing facility users. Table 6A.1 (Appendix - Chapter 6) provides more details about these categories.

Several demographic, health, and functioning variables were included in the data to assist with differentiating individual trajectories of long-term services and supports needs. Marital status was categorized as married, widowed, and other (e.g., divorced, single, never married, separated). Location was based on county of residence and was split between the Twin Cities metropolitan area, other metropolitan areas, outlying counties, rural counties, and unrecorded location. The age group was split into 65-74 years old, 75-84, and 85 and above. Race and ethnicity were categorized as Hispanic and non-Hispanic with non-Hispanic people categorized as Asian/Pacific Islander, Black/African American, Multiple races, Native American/Native Alaskan, White, or unrecorded race and ethnicity. Activities of Daily Living dependencies were based on a full 16-point scale that differentiated between extensive and total assistance. The points on the 16-point scale were categorized as low (0-4), medium (5-12), and high (13-16) dependency. Binary variables were included for gender, if the individual qualified for nursing home level of care, NF use in the two years prior to cohort entry, HCBS use in the two years prior to cohort entry, and a diagnosis of dementia or cognitive impairment.

Simulation Details: Model Overview

We adopted a micro simulation approach in projecting Long-Term Service and Support (LTSS) needs over a five-year period for individual members of the LTSS population during that period. We chose three future periods 2025-2029, 2030-2034, 2035-2039. A simulation allows us to account for uncertainty and permits flexibility in testing the impact of different assumptions about future events, patterns of care, and payments for services. The model follows the semi-Markov paradigm with details in the Appendix Chapter 6.

Simulation Details: LTSS Categories

We have selected 13 specific LTSS categories (groups) for purposes of the simulation. These specific categories are:

- deceased,
- Elderly Waiver Community (EWC),
- Elderly Waiver Residential (EWR-primarily assisted living),
- Medicaid NF stay of 29 days or less (MA NF 0-29),
- Medicaid NF stay of 30-90 days (MA NF 30-90),
- Medicaid NF stay of 91 or more days (MA NF 91+),
- enrolled in Medicaid but not receiving LTSS (MA Non-LTSS),
- Personal Care Assistance without being enrolled in a waiver program (PCA),
- Alternative Care waiver (AC),
- NF stay of 29 days or less while not enrolled in Medicaid (NF 0-29),
- NF stay of 30-90 days while not enrolled in Medicaid (NF 30-90),
- NF stay of 91 or more days while not enrolled in Medicaid (NF 91), and
- not enrolled in Medicaid and not receiving any LTSS (Non-MA Non-LTSS).

The two categories that include individuals not receiving LTSS includes those individuals who had a history of using a NF or other LTSS during the data period or in the two-year look back period.

Simulation Details: Simulation Runs

Three scenarios were run to test the impact on projections of changing the assumptions of LTSS usage rates and a shift away from institutional care towards greater home and community-based service use.

- The base case assumes that the usage rate (percentage of older adults using LTSS) and initial LTSS subgroup distribution follow pre-pandemic patterns into the future ('a return to normal').
- The COVID case assumes a drop in the usage rates and a shift in initial LTSS subgroup away from NF use based on the patterns seen during the first half of the pandemic ('the new normal').
- The NF Shift scenario assumes that the usage rate returns to pre-pandemic levels, but the shift away from NF use observed during the pandemic holds into the future.

For each scenario, three cohorts were run beginning in January of 2025, 2030, and 2035, and followed for 5 years. The simulation included 60 total months in each run – 2025-2029, 2030-2034, 2035-2039. Cohorts were refreshed at the start of each following year (new entries into the cohort) so that the simulation results would represent total LTSS use for the 5-year period. All scenarios use the same population projections by age group. For each scenario, real person profiles were sampled from the data with replacement to match age and starting LTSS subgroup requirements, but their trajectories ('case histories') were generated by the simulation model. To facilitate within simulation comparisons over time, a baseline cohort was simulated from 2016-2020 with the pandemic effect removed. This cohort served both to validate the simulation's ability to mimic observed patterns and as a baseline for comparison for projections over time.

Table 6.1 and Table 6.2 display the key assumptions around cohort sizes, age groups, and entry LTSS subgroup across scenarios. Note that cohort sizes used for the simulation are larger than elsewhere in this report as the numbers include a large number of post-acute NF users and individuals who began the simulation with no LTSS use representing those who would soon require LTSS. Table 6.1 displays the cohort size based upon the percentage of individuals from the population expected to use LTSS (usage rate). Notably, the COVID case assumes a much lower usage rate than the other two scenarios (4.6% vs 6.5-7.0%). Table 6.2 gives the assumed probabilities for initial LTSS subgroup based on age group and scenario. The COVID and NF Shift Cases both assume slightly lower rates of NF use and higher EWC use for the Medicaid enrolled population. Additional detail about age group assumptions is given in the Appendix Chapter 6.

Table 6.1 Cohort Size by Scenario

Scenario	Base Case	COVID Case	NF Shift Case
LTSS Usage Rate	6.5-7.0%	4.6%	6.5-7.0%
Baseline Cohort	80,929		
2025 Cohort Size	115,686	82,142	115,686
2030 Cohort Size	128,945	90,218	128,945
2035 Cohort Size	140,980	92,247	140,980

*Number of individuals entering into the system annually assumed to be 30% of initial cohort size. Cohort size includes individuals beginning the year without service use but expected to begin service use during that calendar year as well as a large number of post-acute nursing facility users. Usage Rate is the proportion of projected total older adult population appearing in the simulation.

Table 6.2 Distribution of Initial LTSS Subgroup by Age Group at Cohort Start

	Base Case			COVID Case/NF Shift Case		
	Age: 65-74	Age: 75-84	Age: 85+	Age: 65-74	Age: 75-84	Age: 85+
EWC	24.6%	22.1%	9.0%	25.8%	23.6%	9.9%
EWR	5.8%	9.6%	13.1%	6.3%	10.6%	14.9%
MA NF 0-29	0.6%	0.6%	0.6%	0.5%	0.5%	0.5%
MA NF 30-90	1.6%	1.8%	2.5%	1.3%	1.5%	2.1%
MA NF 91+	7.5%	10.4%	17.7%	6.1%	8.7%	15.1%
MA Non-LTSS	16.7%	6.1%	2.4%	17.4%	6.4%	2.5%
MA PCA W/O Waiver	8.3%	3.0%	1.3%	8.7%	3.2%	1.4%
NON-MA AC	2.7%	3.2%	2.8%	2.8%	3.4%	3.0%
NON-MA NF 30-90	1.0%	1.8%	3.1%	1.0%	1.9%	3.4%
NON-MA NF 91+	1.4%	3.6%	10.6%	1.5%	3.8%	11.5%
NON-MA NON-LTSS	28.4%	35.4%	34.3%	27.1%	33.9%	32.9%
Non-MA NF 0-29	1.4%	2.2%	2.7%	1.5%	2.4%	2.9%

Results

This section of the report describes the results of the micro simulation.

Beginning Characteristics, Survival and Medicaid Conversion

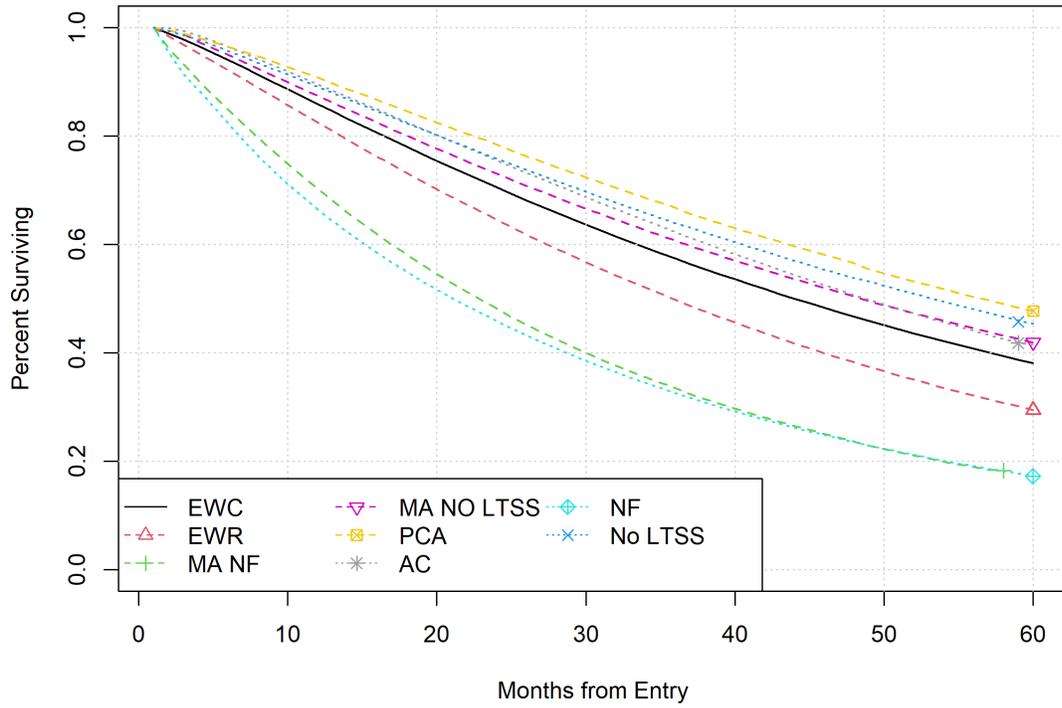
Table 6.3 displays the characteristics of the individual profiles used in the simulation across cohorts. These characteristics were not assumed to change across simulation scenarios and only the age distribution was assumed to change between the simulated cohorts (i.e., over time). The average age is 81.6 for the pre-pandemic period which is assumed to dip to 81.2 for the 2025 cohort before rising to 81.4 in the 2030 cohort and 82.1 for the 2035 cohort following population projections mapped to the LTSS population. Simulated individuals are assumed to be majority non-Hispanic White, female, unmarried with about 35% having a dementia diagnosis or cognitive impairment and a majority having moderate activity of daily living dependency.

Table 6.3 Demographic and Functioning Characteristics by Simulation Cohort

	Base	Cohort 2025	Cohort 2030	Cohort 2035
Mean age	81.6	81.2	81.4	82.1
White Non-Hispanic	86%	86%	86%	87%
Black/African American	5.2%	5.5%	5.3%	4.9%
Asian/Pacific Islander	4.3%	4.5%	4.4%	4.2%
Hispanic	1.0%	1.1%	1.0%	1.0%
Native American or Alaskan	0.9%	0.9%	0.9%	0.8%
Multiple Race or Ethnicities	0.2%	0.2%	0.2%	0.2%
Female	63%	63%	63%	63%
Married (vs. widowed/unmarried)	11%	11%	11%	11%
Dementia or Cognitive Impairment	35%	35%	35%	36%
Low ADL Need (vs. Medium Need)	35%	35%	35%	34%
High ADL Need (vs. Medium Need)	1.8%	1.8%	1.8%	1.8%

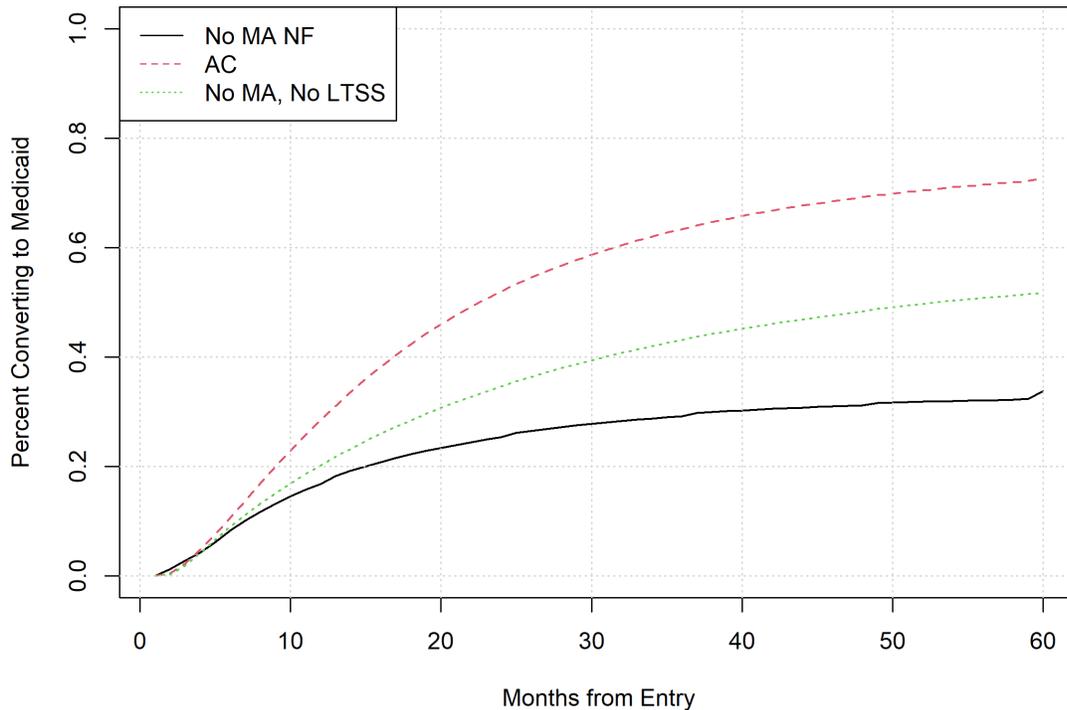
Figure 6.2 displays the simulated survival rate by entry LTSS subgroup over a 5-year time horizon across all three scenarios. Individuals who enter the simulation cohort as part of the annual refresh, in years 2-4 of the 5-year simulation period, do not appear in the later months of the figure (i.e., an individual entering in year 2 of the cohort would not count towards the last 12 months of the figure only the first 48 months). The scenarios are pooled to calculate both survival and Medicaid conversion as simulated rates did not differ substantively across scenarios. Those who began with Personal Care Assistance (PCA) without being enrolled in a waiver program had the highest survival rates while those who began in a nursing facility (NF) had the lowest survival rates on average, regardless of Medicaid enrollment status. The Elderly Waiver – Residential (EWR) had the next lowest survival, well below the people who began by participating in the Elderly Waiver -Community (EWC), Alternative Care (AC) and PCA without a waiver. Figure 6.3 shows the simulated Medicaid conversion rates for the three non-Medicaid enrolled beginning statuses. Those who began in the Alternative Care Waiver program had the highest 5-year Medicaid enrollment rates. Note that the non-Medicaid no Long-Term Service and Supports (LTSS) group represents those who are about to use LTSS within the next year, which includes directly enrolling in a Medicaid waiver program.

Figure 6.1 Survival Rate by Entry LTSS Subgroup over 5 Year Period (All Three Scenarios Included)



Survival rate by starting LTSS subgroup. Each curve stands for the percentage of individuals who began the simulation in that LTSS subgroup who remained alive until the number of months on the x-axis. Curves vertically higher in the plot represent groups with longer average survival times.

Figure 6.2 Medicaid Conversion Rate by Entry LTSS Subgroup over 5 Year Period (All Three Scenarios Included)



Medicaid conversion rate by starting LTSS subgroup. Each curve represents the percentage of individuals in that LTSS subgroup that converged to Medicaid by the number of months on the x-axis. Curves vertically higher in the plot had a faster average time to Medicaid conversion.

Total 5-Year Person Months for Each Scenario

Table 6.4 displays the average simulated person months across a 5-year period in each LTSS subgroup and differences between the baseline scenario and the other two scenarios for each LTSS subgroup. The mean person months approximate the average number of people in the LTSS system per month over the 5-year time horizon of each simulation. Simulated confidence intervals are in the Appendix - Chapter 6. In the baseline scenario, which assumes continued usage rates and patterns as the pre-pandemic period, Elderly-Waiver Community (EWC), Elderly Waiver Residential (EWR), and Medicaid Nursing Facility (MA NF) make up the bulk of the service use months, although non-Waiver Personal Care Assistance (PCA), Alternative Care Waiver program (AC), and non-Medicaid Nursing Facility (NF) use also show growth over the simulated period. The COVID scenario assumes a lower overall LTSS usage rate and a shift away from MA NF towards EWR and EWC. This is reflected in the downward shift in the person months for each category and the relatively larger number of EWC months relative to EWR and MA NF. The Nursing Facility Shift (NF Shift) scenario assumes a return to pre-pandemic LTSS usage rates, but the same shift away from MA NF towards EWC assumed in the COVID scenario.

Elderly Waiver – Community. Figure 6.4 displays the mean number of person months of EWC across scenarios and cohorts. EWC months were simulated to grow 72% in the 2035 cohort

relative to the pre-pandemic period. The COVID scenario represents a significant drop in EWC months relative to the baseline scenario, with person months 27-32% lower than the baseline scenario. EWC person months were projected to peak in the 2030 cohort under this scenario. The NF Shift scenario projects a slight bump in EWC person months of around 3% for each cohort.

Elderly Waiver – Residential: Figure 6.5 gives the mean the number of person months of EWR across scenarios and cohorts. EWR months were simulated to grow 74% in the 2035 cohort relative to the pre-pandemic period. The COVID scenario represents a significant drop in EWR months relative to the baseline scenario, with person months 26-32% lower than the baseline. The greatest growth in EWR occurred between the 2025 cohort and 2030 cohort under this scenario. The NF Shift scenario projects a slight bump in EWR person months of around 4% for each cohort.

Medicaid NF: Figure 6.6 gives the mean the number of person months of MA NF use across scenarios and cohorts. MA NF months were simulated to grow 72% in the 2035 cohort relative to the pre-pandemic period. The COVID scenario represents a significant drop in MA NF months relative to the baseline scenario, with person months 32-37% lower than the baseline scenario. The greatest growth in MA NF was projected to occur between the 2025 and 2030 cohorts in this scenario. The NF Shift scenario projects a slight drop in MA NF person months of around 4% for each cohort.

Non-Waiver PCA: Figure 6.7 gives the mean the number of person months of non-Waiver PCA use across scenarios and cohorts. PCA months were simulated to grow 64% in the 2035 cohort relative to the pre-pandemic period. The COVID scenario represents a significant drop in PCA months relative to the baseline scenario, with person months 25-31% lower than the baseline scenario. PCA was projected to peak in the 2030 cohort with slightly lower person months projected for the 2035 cohort under this scenario. The NF Shift scenario projects a slight bump in PCA person months of around 5% for each cohort when compared to the baseline scenario.

Alternative Care: Figure 6.8 gives the mean number of person months of AC use across scenarios and cohorts. AC months were simulated to grow 75% in the 2035 cohort relative to the pre-pandemic period. The COVID scenario represents a significant drop in AC months relative to the baseline scenario, with person months 29-34% lower than the baseline scenario. The NF Shift scenario projects a slight bump in AC person months of around 1% for each cohort when compared to the baseline scenario, but this change appears negligible given the uncertainty around the estimated means.

Non-Medicaid NF: Figure 6.9 gives the mean number of person months of non-Medicaid NF use across scenarios and cohorts. NF months were simulated to grow 76% in the 2035 cohort relative to the pre-pandemic period. The COVID scenario represents a significant drop in NF months relative to the baseline scenario, with person months 28-34% lower than the baseline scenario. The NF Shift scenario projects a slight bump in NF person months of around 1% for each cohort when compared to the baseline scenario.

Table 6.4 Simulated Means for Person Months of LTSS by Subgroup, Scenario, and Cohort

	Scenario	2016 Cohort*	2025 Cohort	2030 Cohort	2035 Cohort
EW Community	Baseline	12,165	17,787	19,746	20,884
EW Residential	Baseline	10,017	14,381	16,032	17,447
MA NF	Baseline	11,139	15,827	17,536	19,141
PCA	Baseline	2,781	4,064	4,434	4,554
AC	Baseline	3,214	4,651	5,196	5,642
Non-MA NF	Baseline	5,704	8,044	8,996	10,040
EW Community	COVID	12,165	13,031	14,248	14,107
EW Residential	COVID	10,017	10,602	11,647	11,879
MA NF	COVID	11,139	10,773	11,756	11,997
PCA	COVID	2,781	3,038	3,258	3,127
AC	COVID	3,214	3,324	3,662	3,711
Non-MA NF	COVID	5,704	5,775	6,363	6,636
EW Community	NF Shift	12,165	18,352	20,377	21,565
EW Residential	NF Shift	10,017	14,938	16,651	18,147
MA NF	NF Shift	11,139	15,188	16,818	18,349
PCA	NF Shift	2,781	4,277	4,662	4,779
AC	NF Shift	3,214	4,676	5,232	5,686
Non-MA NF	NF Shift	5,704	8,129	9,096	10,148
% Difference from Baseline Scenario					
EW Community	COVID		-27%	-28%	-32%
EW Residential	COVID		-26%	-27%	-32%
MA NF	COVID		-32%	-33%	-37%
PCA	COVID		-25%	-27%	-31%
AC	COVID		-29%	-30%	-34%
Non-MA NF	COVID		-28%	-29%	-34%
EW Community	NF Shift		3%	3%	3%
EW Residential	NF Shift		4%	4%	4%
MA NF	NF Shift		-4%	-4%	-4%
PCA	NF Shift		5%	5%	5%
AC	NF Shift		1%	1%	1%
Non-MA NF	NF Shift		1%	1%	1%

* 2016 Cohort run for 5-years assuming no Pandemic effect on usage rate or service usage patterns, serves as a baseline for comparisons over time.

Figure 6.3 EW Community Mean Months by Simulation Cohort and Scenario

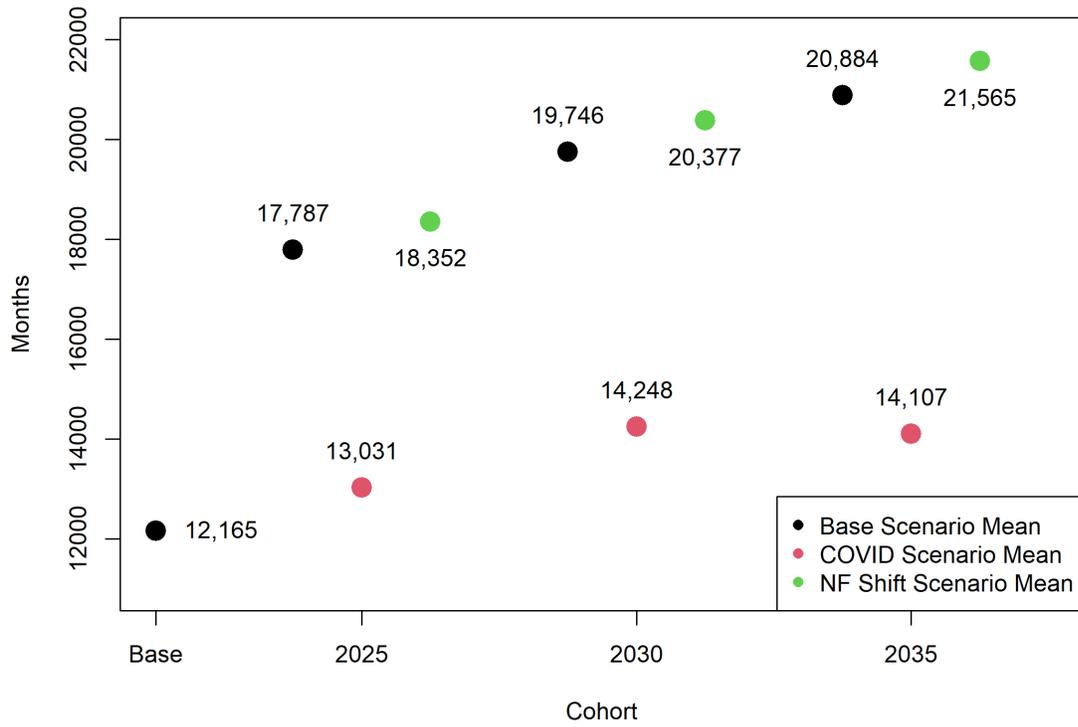


Figure 6.4 EW Residential Mean Months by Simulation Cohort and Scenario

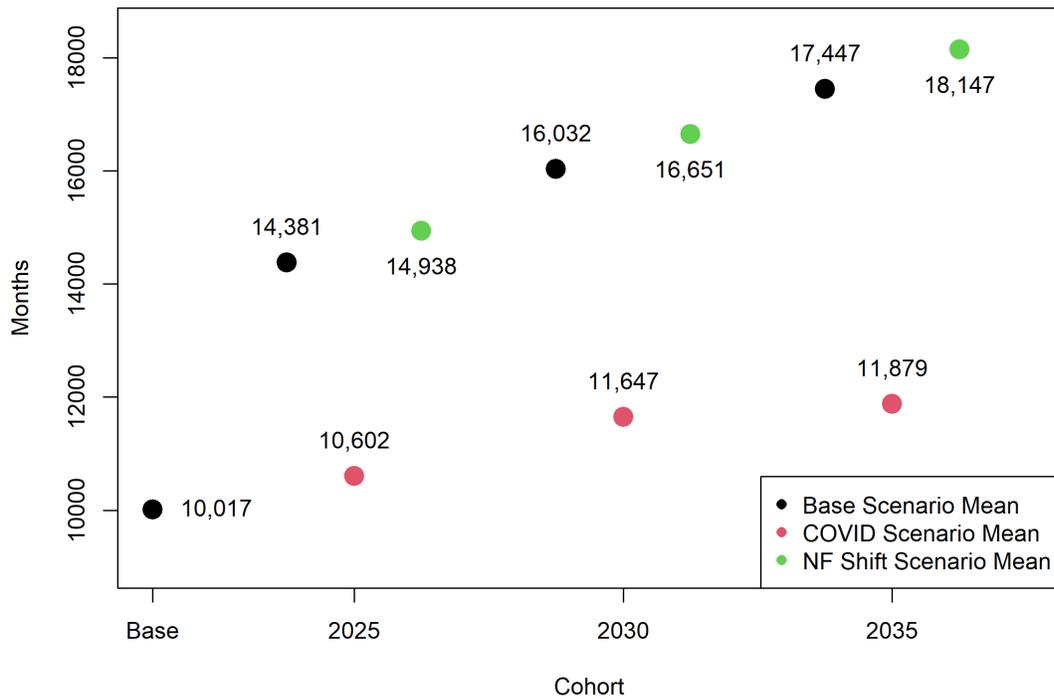


Figure 6.5 Medicaid NF Mean Months by Simulation Cohort and Scenario

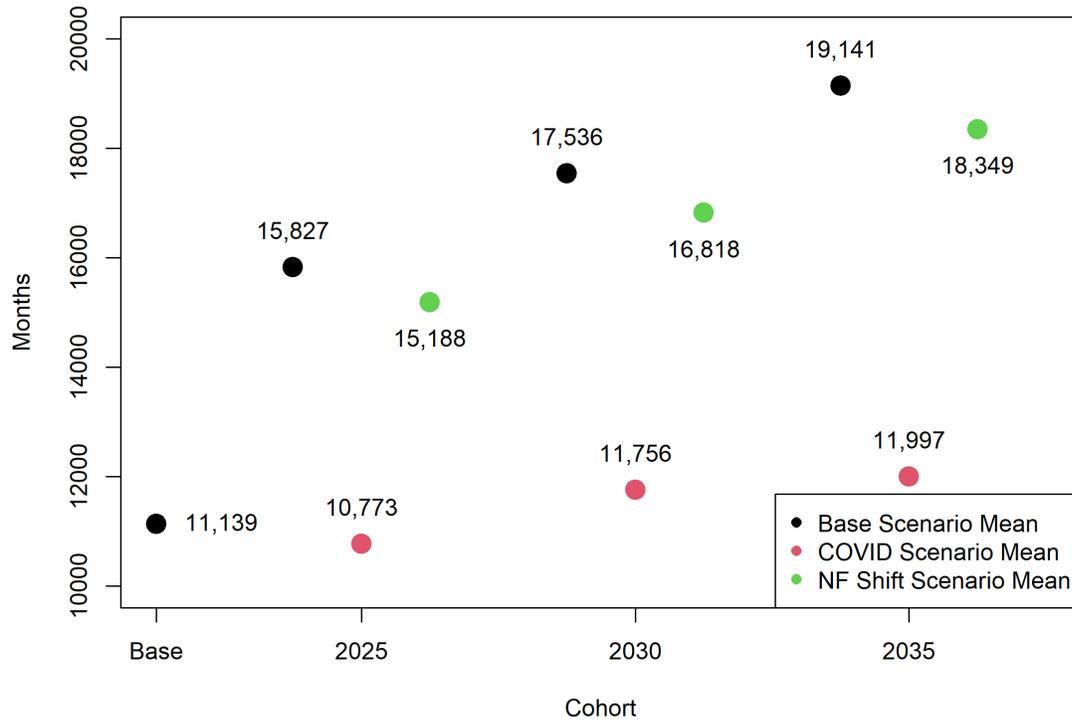


Figure 6.6 Non-Waiver PCA Mean Months by Simulation Cohort and Scenario

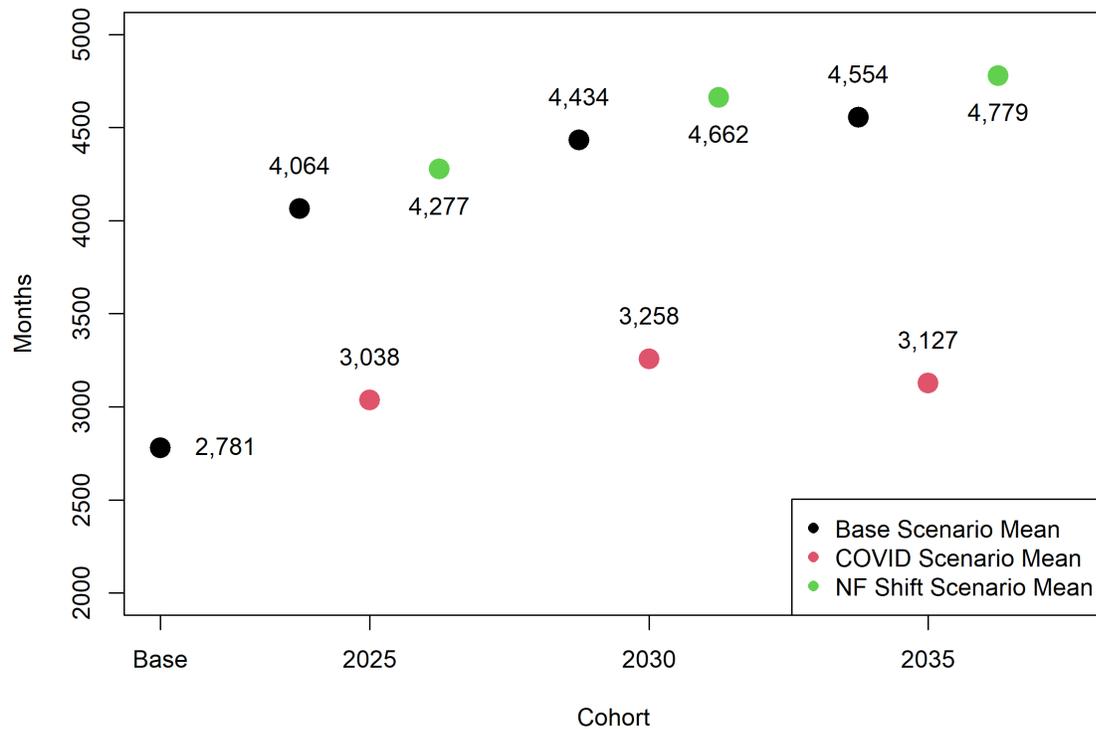


Figure 6.7 Alternative Care Mean Months by Simulation Cohort and Scenario

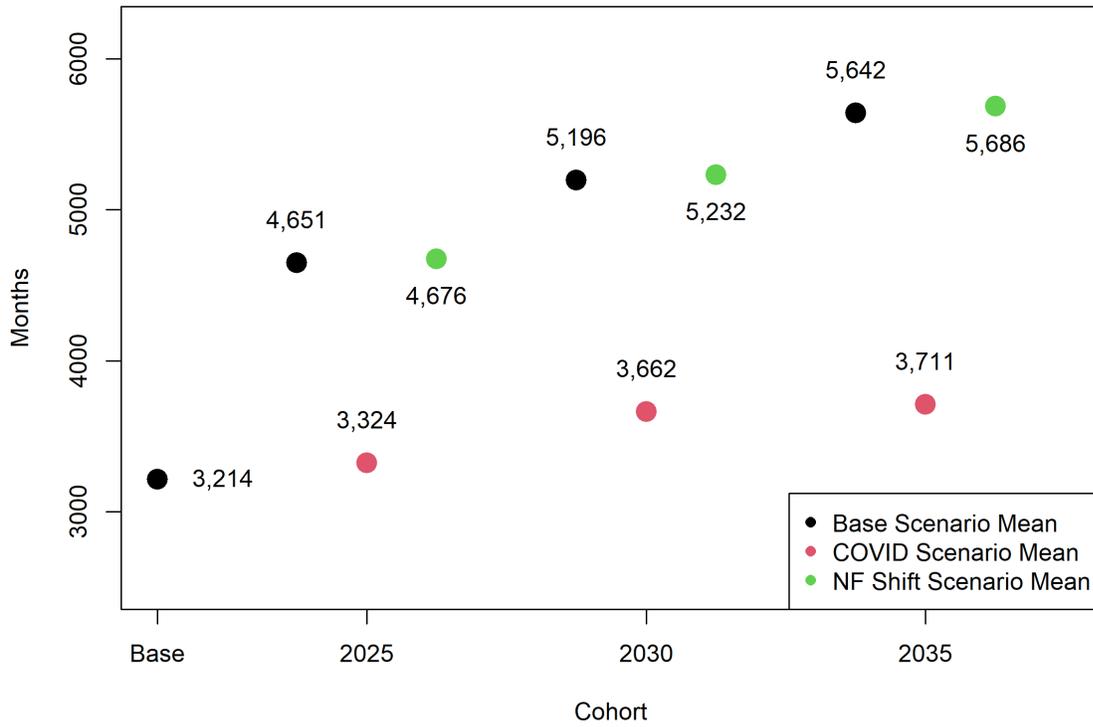
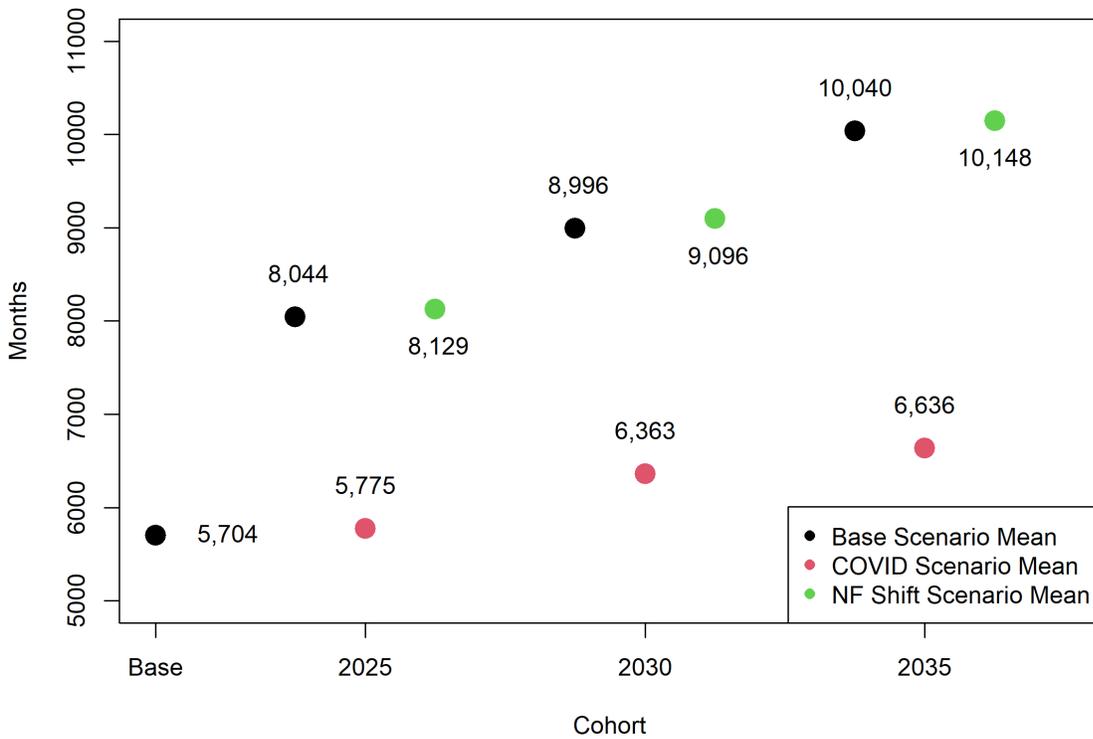


Figure 6.8 Non-Medicaid NF Mean Months by Simulation Cohort and Scenario



Annual Average Medicaid Payments for Each Scenario

Table 6.5 translates the prior set of simulated person months into annual average Medicaid payments for the category over a 5-year period (presented as annual averages). Differences for the COVID and NF shift scenario are given relative to the baseline scenario in both absolute payment changes and percentage changes. Simulated confidence intervals are in the Appendix - Chapter 6. All calculations are based on the 2018 mean expenditures and assuming a 2.5% inflation rate. Medicaid nursing facility use was projected to be the most expensive group across all scenarios.

Total average annual Medicaid payments across the LTSS subgroups were highest in the baseline scenario. Compared to the 2025-2029 cohort with total annual Medicaid payments of \$2,887 million, payments were projected to increase by 26% for the 2030-2034 cohort (to \$3,620 million) and 53% for the 2035-2039 cohort (to \$4,423 million). While payments also increased between years for the COVID-related scenarios, the increase was less than the baseline scenario. Simulation results from the COVID scenario (drop in utilization) showed 29% less in total average annual Medicaid payments relative to the baseline scenario (\$845 million less) for the 2025-2029 cohort, 30% less for the 2030-2034 cohort (\$1,098 million less) and a 35% less for the 2035-2039 cohort (\$1,542 million less). The decrease in total average annual Medicaid payments was smaller for the NF Shift scenario, ranging from \$10 - \$18 million per cohort.

Note that totals given in Table 6.5 are not expected to match the straight-line projections from Chapter 5 of the report, even for the baseline scenario, due to differing methodology. For example, the simulation utilized inflation indexing beyond the beginning year of each cohort (e.g., 2025-2029, 2030-2034, and 2035-2039), Medicaid payments for all post-acute NF users were included even those with no long term LTSS use, and models were adjusted for characteristics and functional need. However, the impact of the inclusion of short stay post-acute NF users was relatively small on Medicaid payments as much of their cost is paid by Medicare.

Elderly Waiver – Community: Figure 6.10 shows the simulated annual average Medicaid payment amounts for EWC for each cohort and simulation scenario. EWC annual average Medicaid payments were estimated at a \$491 million increase for the 2035 cohort relative to the baseline cohort. The COVID scenario represents a significant drop in EWC annual average Medicaid payments relative to the baseline scenario, an estimated \$251 million annual decrease relative to the baseline scenario for the 2035 cohort. The NF Shift scenario projects a slight increase in EWC annual average Medicaid payments, estimated at a \$25 million annual increase for the 2035 cohort.

Elderly Waiver – Residential: Figure 6.11 shows the simulated annual average Medicaid payment amounts for EWR for each cohort and simulation scenario. EWR annual average Medicaid payments were estimated at \$584 million for the 2035 cohort relative to the baseline cohort. The COVID scenario represents a significant drop in EWR annual average Medicaid payments with an estimated \$291 million decrease relative to the baseline scenario for the 2035 cohort. The NF Shift scenario projects a slight increase in EWR annual average Medicaid payments of an estimated \$36 million annual increase for the 2035 cohort.

Medicaid NF: Figure 6.12 shows the simulated annual average Medicaid payment amounts for MA NF for each cohort and simulation scenario. MA NF annual average Medicaid payments were estimated at a \$1.5 billion increase for the 2035 cohort relative to the baseline cohort. The COVID scenario represents a significant drop in MA NF annual average Medicaid payments

relative to the baseline scenario, with an estimated \$871 million decrease relative to the baseline scenario for the 2035 cohort. The NF Shift scenario projects a slight drop in MA NF annual average Medicaid payments of an estimated \$94 million decrease for the 2035 cohort.

Non-Waiver PCA: Figure 6.13 shows the simulated annual average Medicaid payment amounts for PCA for each cohort and simulation scenario. PCA annual average Medicaid payments were estimated at a \$184 million increase for the 2035 cohort relative to the baseline cohort. The COVID scenario represents a significant drop in PCA annual average Medicaid payments relative to the baseline scenario, with an estimated \$93 million decrease relative to the baseline scenario for the 2035 cohort. The NF Shift scenario projects a slight jump in PCA annual average Medicaid payments of an estimated \$15 million increase for the 2035 cohort.

Alternative Care: Figure 6.14 shows the simulated annual average Medicaid payment amounts for AC for each cohort and simulation scenario. AC annual average Medicaid payments were estimated at a \$65 million increase for the 2035 cohort relative to the baseline cohort. The COVID scenario represents a significant drop in AC annual average Medicaid payments relative to the baseline scenario, with an estimated \$35 million dollar decrease relative to the baseline scenario for the 2035 cohort. The NF Shift scenario projects a slight bump in AC annual average Medicaid payments of an estimated \$1 million increase for the 2035 cohort.

Non-Medicaid NF: Figure 6.15 shows the simulated annual average Medicaid payment amounts for non-MA NF for each cohort and simulation scenario (individuals who are on Medicaid for a minority portion of the month while in a NF). Medicaid payments represent only a partial month payment for these individuals as private sources cover the remaining costs. Private payments were not included in the report of findings. NF annual average Medicaid payments were estimated at a \$1 million increase for the 2035 cohort relative to the baseline cohort. The COVID scenario represents a significant drop in non-MA NF annual average Medicaid payments relative to the baseline scenario, with an estimated \$1 million decrease relative to the baseline scenario for the 2035 cohort. The NF Shift scenario did not project a measurable change in Medicaid payments for the non-MA NF group for the 2035 cohort.

Table 6.5 Simulated Mean 5-Year Payment* Amounts by LTSS Subgroup, Simulation Cohort, and Scenario (Millions of Dollars)

	Scenario	2016	2025 Cohort	2030 Cohort	2035 Cohort
EW	Baseline	282	514	646	773
EW Residential	Baseline	327	587	741	912
MA NF	Baseline	852	1,512	1,895	2,339
PCA	Baseline	114	207	256	298
AC	Baseline	36	65	82	101
Non-MA NF#	Baseline	1	1	1	2
Total	Baseline	1,611	2,887	3,620	4,423
EW	COVID	282	376	466	522
EW Residential	COVID	327	433	538	620
MA NF	COVID	852	1,030	1,272	1,468
PCA	COVID	114	155	188	204
AC	COVID	36	46	58	66
Non-MA NF#	COVID	1	1	1	1
Total	COVID	1,611	2,042	2,522	2,881
EW	NF Shift	282	530	666	797
EW Residential	NF Shift	327	609	768	947
MA NF	NF Shift	852	1,453	1,820	2,245
PCA	NF Shift	114	218	269	312
AC	NF Shift	36	65	83	102
Non-MA NF#	NF Shift	1	1	1	2
Total	NF Shift	1,611	2,877	3,607	4,405
\$ Change from Baseline Scenario					
EW	COVID		(138)	(180)	(251)
EW Residential	COVID		(155)	(203)	(291)
MA NF	COVID		(481)	(623)	(871)
PCA	COVID		(52)	(68)	(93)
AC	COVID		(19)	(24)	(35)
Non-MA NF#	COVID		(0)	(0)	(1)
Total	COVID		(845)	(1,098)	(1,542)
EW	NF Shift		16	20	25
EW Residential	NF Shift		22	28	36
MA NF	NF Shift		(59)	(75)	(94)
PCA	NF Shift		11	13	15
AC	NF Shift		0	1	1
Non-MA NF#	NF Shift		0	0	0
Total	NF Shift		(10)	(13)	(18)

	Scenario	2016	2025 Cohort	2030 Cohort	2035 Cohort
% Change from Baseline Scenario					
EW	COVID		-27%	-28%	-32%
EW Residential	COVID		-26%	-27%	-32%
MA NF	COVID		-32%	-33%	-37%
PCA	COVID		-25%	-27%	-31%
AC	COVID		-29%	-30%	-34%
Non-MA NF [#]	COVID		-28%	-29%	-34%
Total	COVID		-29%	-30%	-35%
EW	NF Shift		3%	3%	3%
EW Residential	NF Shift		4%	4%	4%
MA NF	NF Shift		-4%	-4%	-4%
PCA	NF Shift		5%	5%	5%
AC	NF Shift		1%	1%	1%
Non-MA NF [#]	NF Shift		1%	1%	1%
Total	NF Shift		-0.3%	-0.4%	-0.4%

* Medicaid payments for MA services.

+ 2016 Cohort run for 5-years assuming no Pandemic effect on usage rate or service usage patterns, serves as a baseline for comparisons over time.

Partial month payments for those who had payments between Medicaid and private sources. Private NF (non-MA NF) payments are not included in the report of findings.

Figure 6.9 EW Community Mean Annual Dollars by Simulation Cohort and Scenario

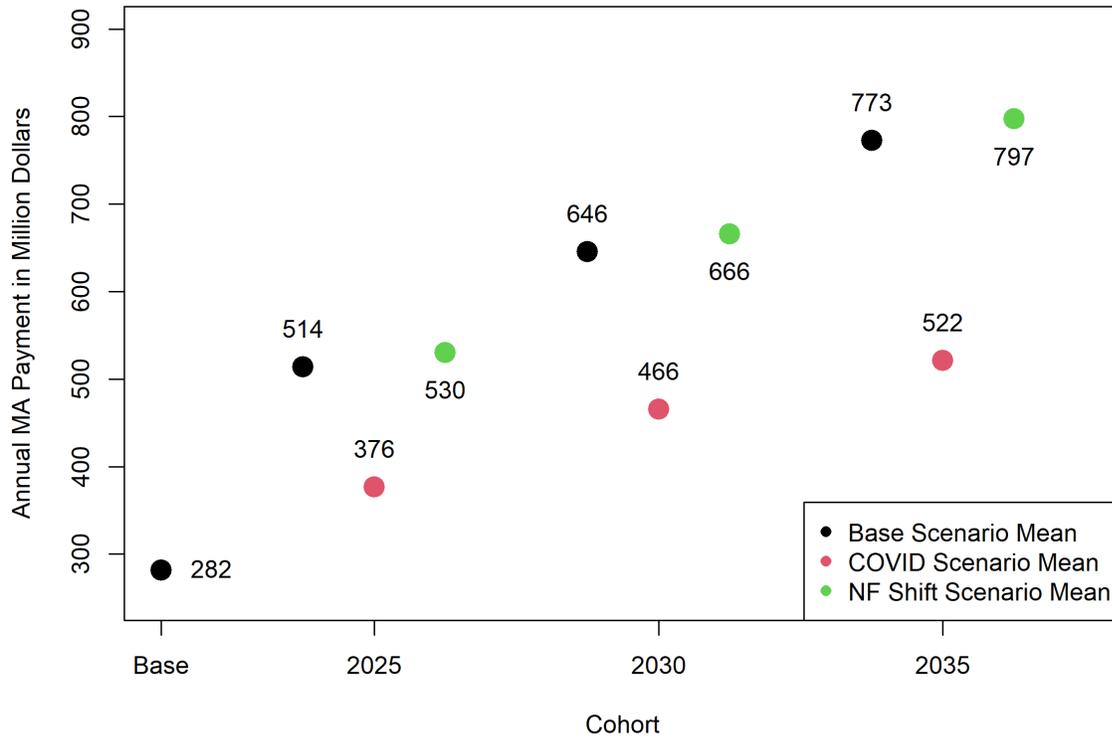


Figure 6.10 EW Residential Mean Annual Dollars by Simulation Cohort and Scenario

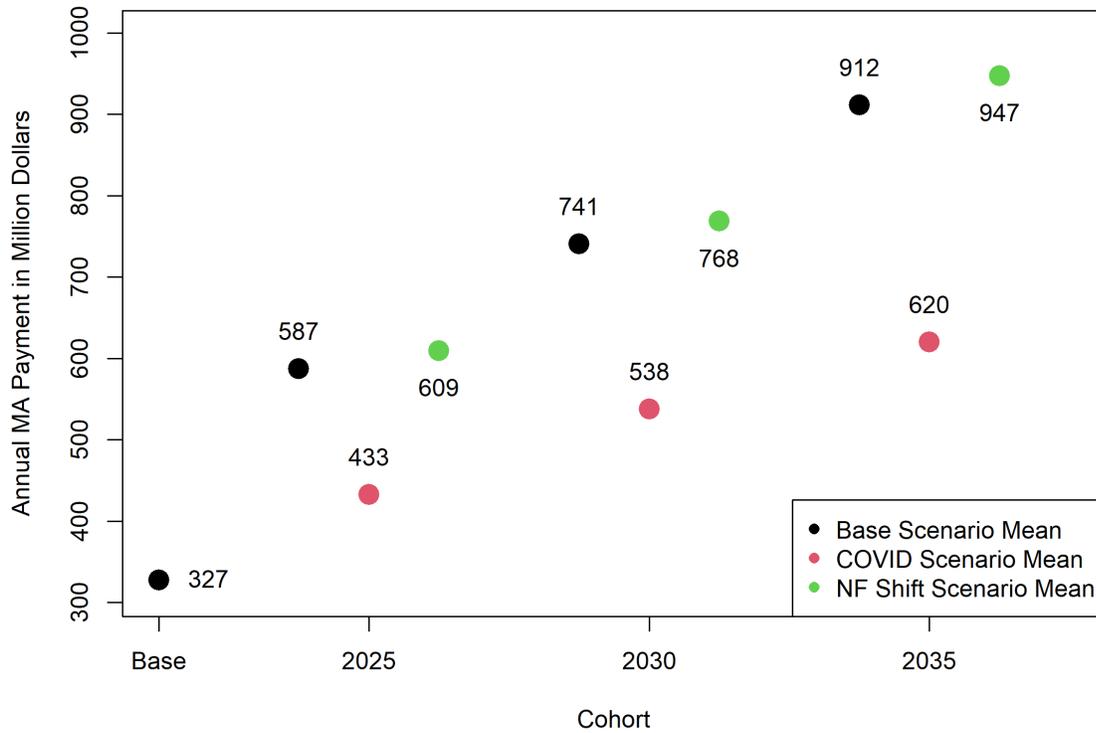


Figure 6.11 Medicaid NF Mean Annual Dollars by Simulation Cohort and Scenario

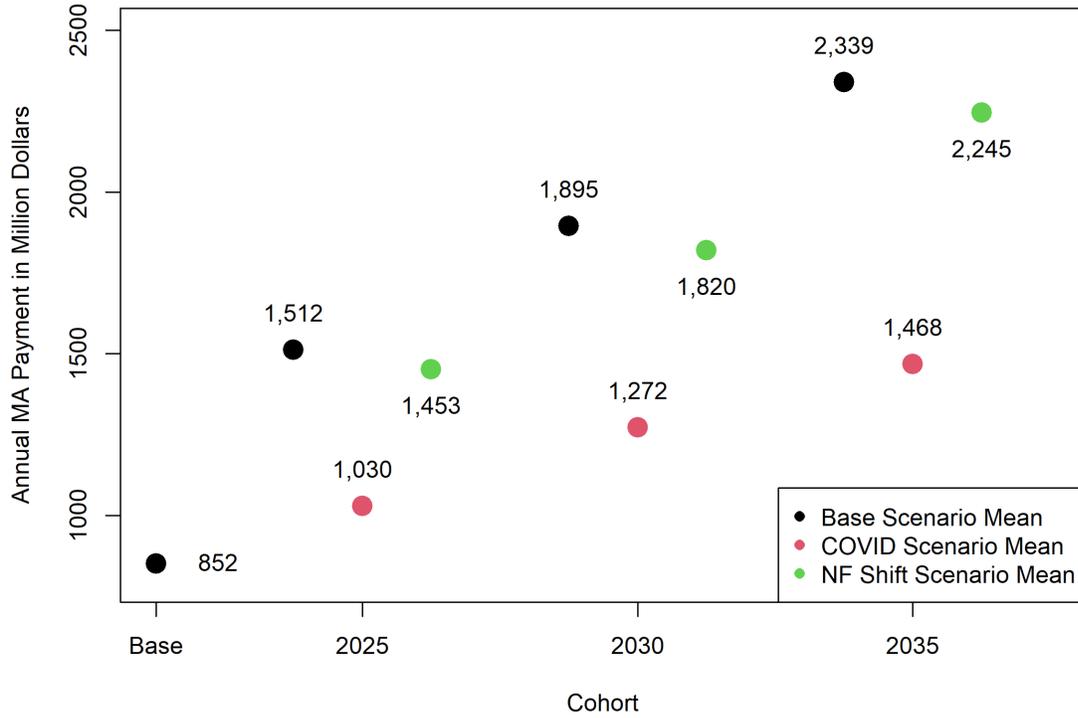


Figure 6.12 Non-Waiver PCA Mean Annual Dollars by Simulation Cohort and Scenario

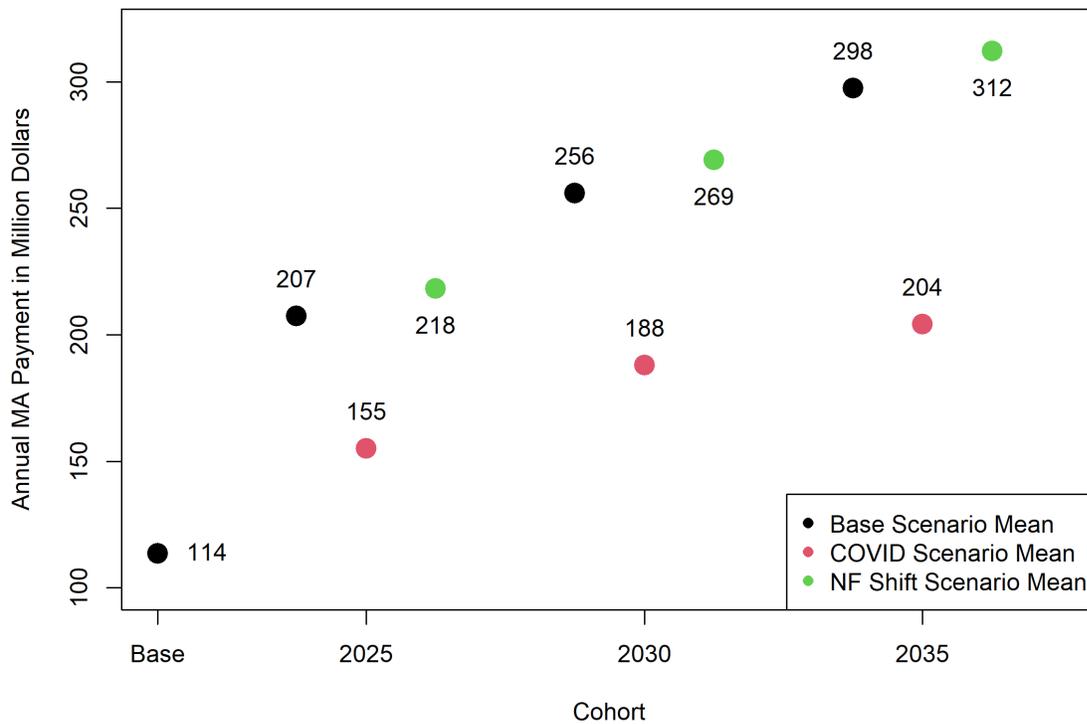


Figure 6.13 Alternative Care Mean Annual Dollars by Simulation Cohort and Scenario

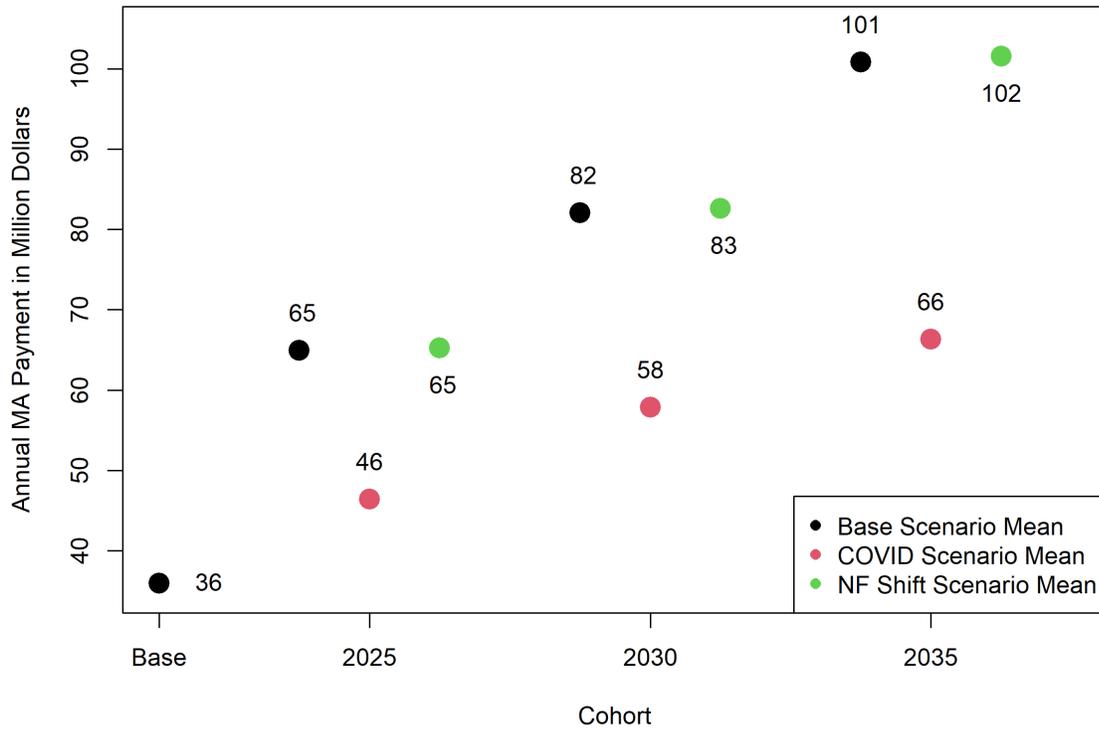
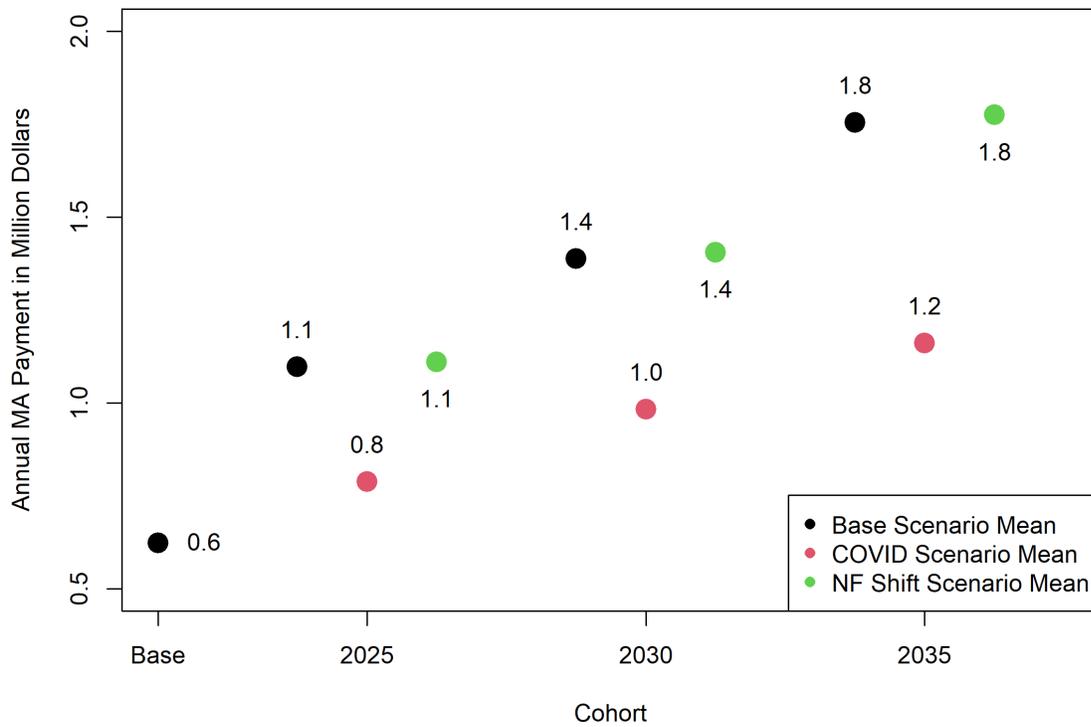


Figure 6.14 Non-MA NF Mean Annual Dollars by Simulation Cohort and Scenario



Caveats and Simplifying Assumptions

As with all projections of future events, the results should be taken as estimates of what may occur as the modeling rests upon several simplifying assumptions. The better these assumptions hold, the more likely the projections are to be near the mark. Here are a few relevant simplifying assumptions:

- The simulation model was trained upon on real data that was observed from 2016 to mid-2021 with follow up occurring as late as mid-2022. The simulations assume that the relationships observed in the data (transition path probabilities and timing of events) continues into the future.
- Outside of the age distribution, all other demographic, health, and functioning data distributions were also assumed to continue into the future. The growth in the population size and age distribution are based on projections by the Minnesota State Demographic Center, but these numbers also rest upon assumptions of what will transpire.
- Payment amount figures are based on observed averages and projected into the future based on a fixed inflation rate of 2.5%. Actual inflation could be higher or lower, and the rate could vary from year to year.
- The model does not account for any policy changes or secular trends that might put an upwards limit on LTSS subgroup membership (e.g., program capped enrollment or lack of workforce availability).
- The base simulations (pre-pandemic period) were run to provide an internal comparison over time and the baseline scenario provides a comparison group for estimates within a time period for potential shifts in service use.

Chapter 7. Summary and Conclusions

Conclusions

The report has presented considerable information about that segment of the Minnesota older population in need of and using long-term services and supports. This information includes their demographic characteristics and areas of need, their current use of LTSS, and their projected future LTSS use and payments over a time horizon from 2023-2035. The following are major conclusions from the report.

- Substantial increases in future LTSS need, utilization and costs are inevitable.
 - Aging of the older population will lead to increased need, particularly as the number of people of advanced old age increases.
 - Increases in LTSS use will be accompanied by increased payments for care because of LTSS cost inflation.
 - Future costs of LTSS may appear daunting, yet state revenues to support LTSS and people's ability to pay privately may also rise with growth in the economy.
- Only about 5% of older people in Minnesota are using LTSS annually and only about 1% are new entrants who begin using LTSS each year.
 - Even with future population projections, there will still be a relatively small percentage of the older population who need and use LTSS.
 - Despite their small numbers, older people in need of care incur very high public and private LTSS costs.
 - Although acute care costs for the LTSS population was not part of this study, we know from other sources that their acute care costs, through Medicare and out of pocket expenses, can be substantial, often well above their LTSS costs.
- The LTSS population is diverse.
 - Users of LTSS services vary widely in age, race/ethnicity, marital status, and other demographic characteristics; and they vary in the need for care for ADL dependencies and cognitive impairment.
 - They use a variety of LTSS services - nursing facilities, assisted living facilities, and home and community-based services.
 - Although Medicaid is the primary payer for LTSS, people not enrolled in Medicaid face sizable private payments for LTSS, particularly for nursing facility care.
 - Future populations needing LTSS will become even more diverse with demographic shifts and the varying economic and social experiences of succeeding generations entering old age.
 - Black/African American, Asian, Hispanic, Native American and other racial/ethnic groups are underrepresented in use of nursing facilities and Medicaid assisted living facilities. These and other differences in patterns of LTSS service use raise questions about equity in access to LTSS both currently and in the future.
- The LTSS services and settings form a complex system of care.

- Older people are continuously entering and exiting the LTSS system; people make multiple transitions between types of LTSS; and Medicaid enrollment is dynamic.
- A change in one part of the system can have ripple effects on other parts. For example, if nursing facilities experience a decline in demand due to absence of available providers, shift in consumer preferences, escalating costs, or a new pandemic, then other options must be made available if rising needs for care are to be met.
- In the current LTSS system, nursing facility residents are older and have substantial need for assistance in activities of daily living, often combined with cognitive impairment and complex medical conditions. In contrast, residents of assisted living facilities are less dependent in activities of daily living, yet they are very likely to suffer from cognitive impairment, frequently accompanied by behavioral health conditions. People participating in the HCBS waiver or PCA, while having significant care needs, tend to be younger, less ADL dependent and less likely to be cognitively impaired.
- Changes in Medicaid policy designed to divert people from one type of LTSS to another, for example from residential to home and community based LTSS, should account for current differences in need across care settings and they should be pursued cautiously.
- The “new normal” after COVID-19 could have a major influence on future patterns of LTSS.
 - Declines in rates of COVID-related LTSS use may continue, as fewer people enter the formal LTSS system.
 - The trend of shifting away from nursing facility care to assisted living facilities or home and community-based services may continue.
 - A decline in overall rates of LTSS use associated with COVID-19 could have an impact on future LTSS payments; however, this scenario is less likely than a shift in types of LTSS use.

Future Study and Policy Implications

Predicting future LTSS usage and dollars is complicated by multiple uncertainties, many of which are beyond the scope of this study. However, they should be addressed in future studies, with the aid of additional simulation modeling or other approaches to provide a higher degree of certainty around future policies. Areas for future study and policy development:

- New normal after COVID-19
 - Trends observed in the current study, based on data through mid-2022, offer a less than complete picture of the lasting COVID-19 effect.
 - After a sharp decline in LTSS use during 2020, particularly in entry to nursing facilities, there was only a partial return to the pre-COVID level in the following year.
 - Future projections of LTSS use and Medicaid payments are highly sensitive to assumptions about the persistence of the COVID-19 effect as well as the response of the system to a future pandemic.

- Gathering additional data on the post-COVID-19 experience can lead to more informed modeling of future LTSS use and costs.
- Changing consumer preferences
 - Personal preferences by consumers and their significant others appear to be shifting away from nursing facilities to other LTSS settings and services.
 - COVID-19 accelerated this trend and resulted in a sharp decline in nursing facility use, particularly among Medicaid enrollees.
 - Additional data on post-COVID patterns of LTSS use can shed light on consumer preferences and more informed modeling of a shift away from nursing facilities to other forms of LTSS.
- Alignment of individual needs for care with LTSS services and settings
 - Changes in health conditions and disability status of the older population, either improvements or declines, could alter the need for and use of LTSS.
 - Projections for the mix of future LTSS services should consider, in particular, the increased prevalence of dementia/cognitive and associated health-related behavioral problems, and the settings and types of services most appropriate for these care needs.
- Role of families and other informal caregivers
 - Users of Medicaid LTSS are much older and less likely to be married than the general older population. Although detailed information was not available for the study, other research suggests that many LTSS users were living alone without immediate support from family or other caregivers.
 - Gathering additional data on patterns of family and other informal resources could fill the gap in information about these valuable resources.
 - More information can lead to modeling of future availability of informal care. Declines in the availability of family and other private provisions of care, paid and non-paid, could put additional pressure on the formal LTSS system to fill this gap in care, particularly through use of nursing facilities and assisted living facilities.
- Equity and access to care for racial and ethnic minorities
 - Although racial and ethnic minorities are well represented among LTSS users in community settings, only small percentages use nursing and assisted living facilities. This situation raises issues of equity and access to care.
 - Is their heavy reliance on home and community-based services (e.g., Elderly Waiver and personal care assistant) a matter of personal choice, cultural traditions, greater availability of family or other informal caregivers, or other care resources? Conversely, are they less likely to use residential care facilities because of a history of discrimination, high out-of-pocket costs, or other access barriers?
 - Understanding and addressing these issues will have implications for future LTSS as the number of older racial and ethnic minorities increases. Future LTSS projections should account for different scenarios of LTSS use by racial and ethnic minorities.
- Supply of care workers and providers

- The future supply of care workers and providers is uncertain. Even before COVID-19, attracting and maintain a caregiver workforce was a challenge. The problem has worsened in subsequent years.
- There are shortages of paraprofessional workers, licensed nurses, especially RNs and APNs, and ancillary staff.
- Future projections will have to consider scenarios where care worker shortages place constraints on the expansion of LTSS and potentially contribute to LTSS cost inflation.
- Costs and financing of LTSS
 - The current study had a substantial gap in information about private payments for LTSS, which in total could approach Medicaid payments. Although the study included use of nursing facility care by people not enrolled in Medicaid, the substantial private cost of this care was not part of the projections. In addition, the study does not consider Medicaid enrollee's share of costs for nursing facilities, assisted living facilities, and the Alternative Care waiver. Finally, the study lacked information entirely about use of and private payments for assisted living facilities and in-home care for people not enrolled in Medicaid.
 - The LTSS cost inflation may significantly exceed the rate of general inflation and personal income, making LTSS even less affordable and putting additional strains on public resources.
 - While nursing facility use has been declining, the Medicaid payment rate per resident day has risen. Since the private pay rate is tied to the Medicaid rates, costs for private paying residents have been going up as well.
 - Improvements in the quality of care by assisted living facilities and home care agencies could contribute to cost increases. Much needed initiatives include stronger licensure requirements, more comprehensive quality of care oversight, increased staffing levels and standards, and higher wages and benefits to attract and maintain the caregiver workforce.
 - The uncertain evolution of the private LTC insurance market, which has been slow in developing, could be a wildcard with the potential to offer asset and income protection for future generations of older people. However, the near-term impact of private LTC insurance is limited by the high cost of insuring the current generation of older people who are at highest risk of needing LTSS. Even longer-term prospects are problematic for a market that has failed to develop on its own.
- All these factors lead to complexity in projecting future need, use and expenditures for LTSS. Probably the best way to address this complexity and characterize the uncertainty of future projections is through micro-simulation modeling which is capable of performing "what if" analyses of alternative scenarios.