



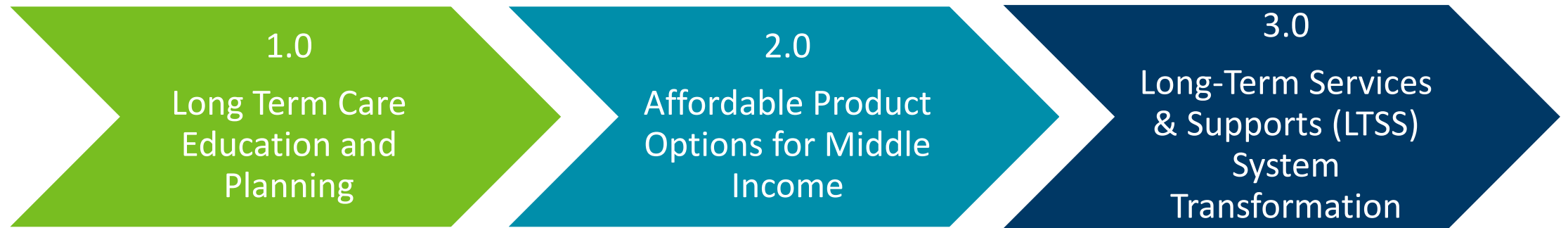
Own Your Future 3.0: Reports Examine New Directions for LTSS in Minnesota

Long-Term Care Discussion Group

December 20, 2023

- **Nikki Peterson**, Quality Assurance and Improvement Planner for the Minnesota Department of Human Services, Aging and Adult Services Division
- **John O'Leary**, President of O'Leary Management Associates LLC
- **Steve Schoonveld**, Managing Director with FTI Consulting

Own Your Future History in Minnesota



Current Sources of LTSS Coverage

Sources of LTSS Coverage in Minnesota, by Family Income

Family Income	Percent of Age 65+ Pop	Medicaid Programs	Alternative Care	OAA	Out-Of-Pocket	Private Insurance
<\$10,000	5%	X				
\$10,000-24,999	20%	X	X			
\$25,000-49,999	25%	X	X	X	X	
\$50,000-74,999	19%		X	X	X	
\$75,000-99,999	11%			X	X	
\$100,000-\$124,999	8%				X	X
\$125,000-\$149,999	3%				X	X
>=\$150,000	9%				X	X

*The distribution of total, HCBS, and NF populations by family income is based on national HRS data. These distributions have been controlled to align with the family income distribution of Minnesota. These figures are estimates that should be used to understand the general relationship between care need and family income level.

System Transformation to Increase Access to LTSS

Phase 1 – Demographics and Projections for Minnesota's Older Adult Population

- Data on MN older adult population by wide range range of variables
- Current Medicaid LTSS and future projections
- Completed by University of Minnesota and Purdue University

Phase 2 – LTSS Funding and Services Initiative

- Stakeholders from Minnesota, national experts, mini sessions
- Three Options emerged:
 - Care Navigation & Support Services
 - Medicare Companion Product
 - Catastrophic Lite

The Research Team



Carefully Selected
Stakeholders

Advisory Council

Key Subject Matter
Experts

The Stakeholders

Selected as a body of varying viewpoints from representatives across the state to address health inequities to LTSS services. Stakeholder input was vital in the funding solution selection process.

Stakeholders included Constituents from the Following:		
AARP MN	Minnesota Department of Commerce	MN Health Plans
Age-Friendly MN Council	Minnesota Department of Human Services	MN Home Care Association
Arrowhead Area Agency on Aging	Minnesota Board on Aging	MN Home Care Association
Blue Cross/Blue Shield MN	Minnesota Insurance and Financial Services Council	MN Office of the Ombudsman for LTC
Care Providers of MN	MN Alzheimer’s Association	Newman LTC
Fairview Southdale Hospitals	MN Area Board on Aging	Purdue University
Horizon Agency	MN Chamber of Commerce	Securian
Le Clair Group	MN Chamber of Commerce	State Health Access Data Assistance Center
Leading Age MN	MN Department of Human Services	Thrivent Trellis

Consultants, Advisory, and Expert Panelists

Consultants and Expert Panelists included constituents from the following:

ACLI	Federal Life Insurance Company	LeClair Group	NAIFA	Securian
ADvancing States	Genworth	Long-Term Care Associates	National Academy of Elder Law	TCare
America's Health Insurance Plans	HealthPartners	LTCI Partners	New York Life	The Carolyn Olson Group
Ameriprise / RiverSource	Horizon Agency	Medica	Newman LTC	The Helper Bees
ARRM	Ice Floe Consulting	Minnesota Business Partnership	OPGMedia	Thrivent Financial Services
CA Healthcare Advisors	Illumifin	Minnesota Chamber of Commerce	PA Department of Insurance	Trualta
Cares Plan Washington	Impact 180	Minnesota Department of Commerce	Primewest	UCare
Colorado Area Agency on Aging	Independent Living Systems	Minnesota Department of Human Services	RBC Wealth Management	UHAS
Colorado State Representative	Industry Consultant	Minnesota Board on Aging	Reverse Mortgages SIDAC	United Healthcare
Compliance Expert	John Hancock	Minnesota Department of Revenue	Sage Partners	Vitality
ET Consulting	Juniper	Minnesota Insurance and Financial Services Council	Scenscio	Wisdom Steps
Fairview Southdale Hospitals				8



The System of Long-Term Services and Supports (LTSS) among Older Adults in Minnesota

Greg Arling & Zachary Hass, Purdue University

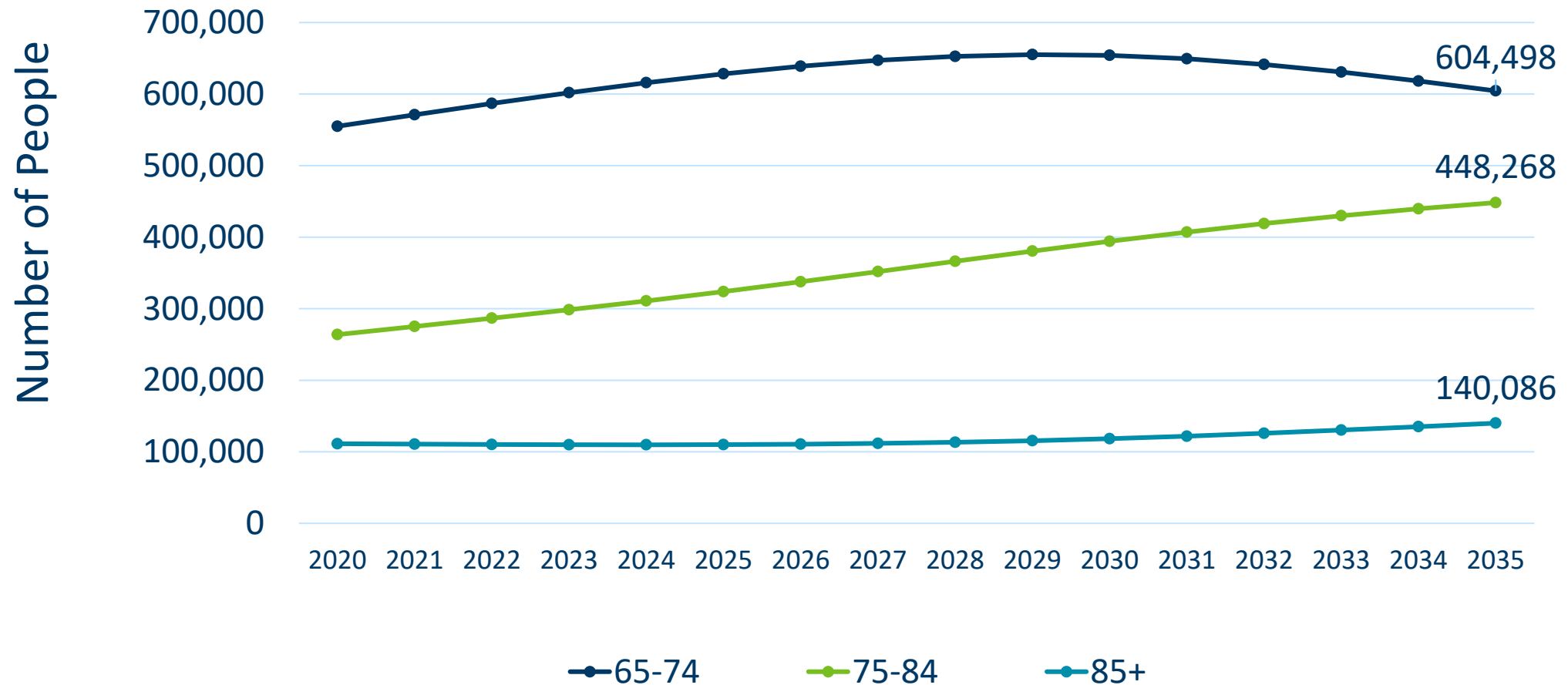
Lynn Blewett & Mark Woodhouse, University of Minnesota

- Background
- Characteristics of current LTSS users
- Future LTSS usage and expenditure
- COVID-19 Impact on LTSS
- Conclusions and Caveats

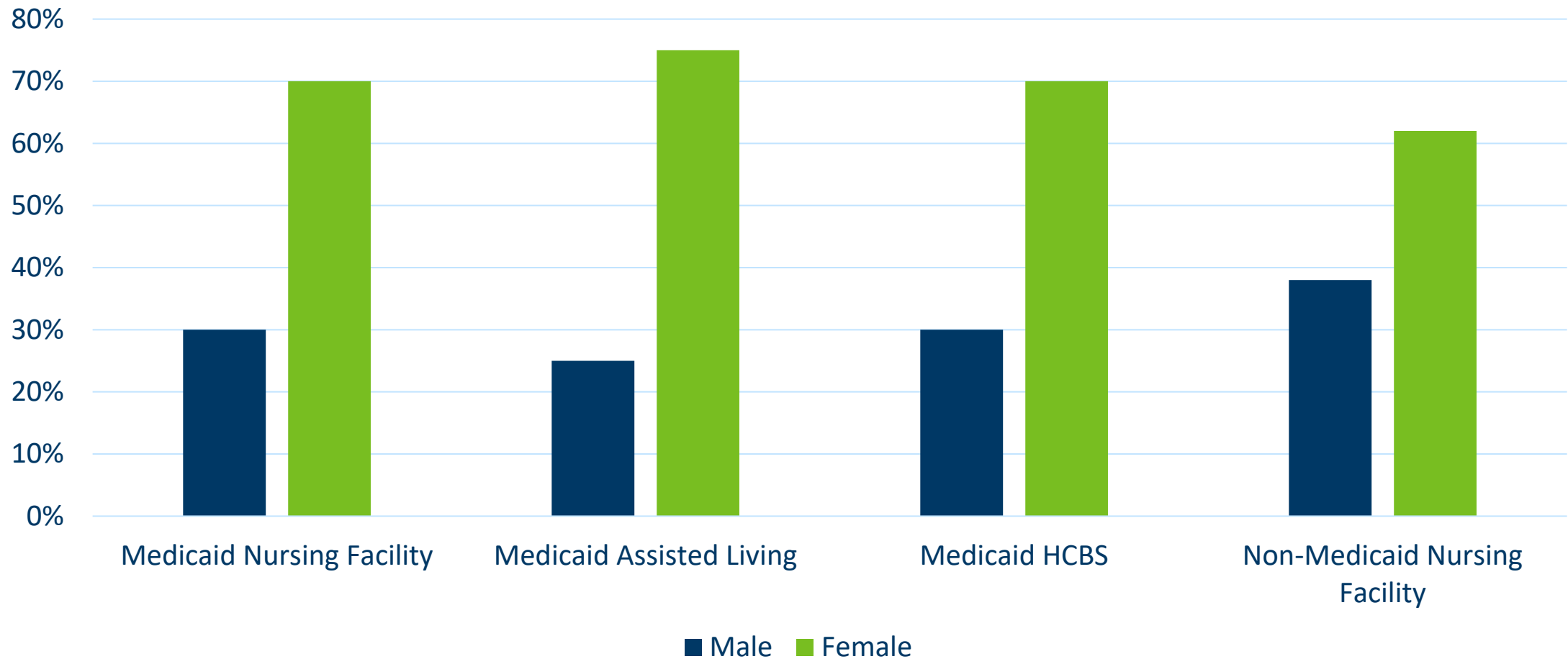
- Study current and future use of Long-Term Services and Supports (LTSS) for older Medicaid enrollees and the general population age 65 and older in Minnesota
- Describe the baseline characteristics, LTSS service utilization, and LTSS expenditures for Minnesota's older population in 2016-2021
- Develop 10-year projections for utilization and expenditure for LTSS in Minnesota

- Medicaid Management Information (MMIS)
- Nursing home Minimum Data Set (MDS)
- American Community Survey and US Census Data
- Minnesota death records and State Demographic Center population projections
 - Demographic characteristics
 - Need for LTSS
 - Months of LTSS use
 - Medicaid payments for LTSS services

The highest growth rate in Minnesota's older adult population is projected to be aged 75-84 (baby boomers)

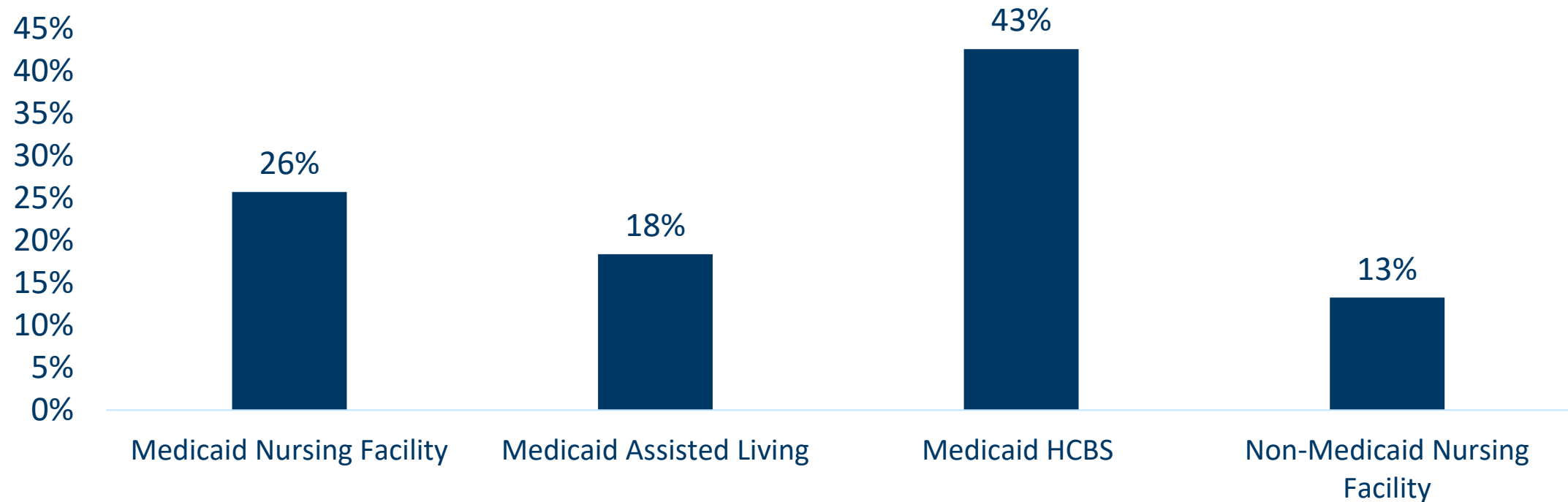


Users of all types of LTSS were predominately female



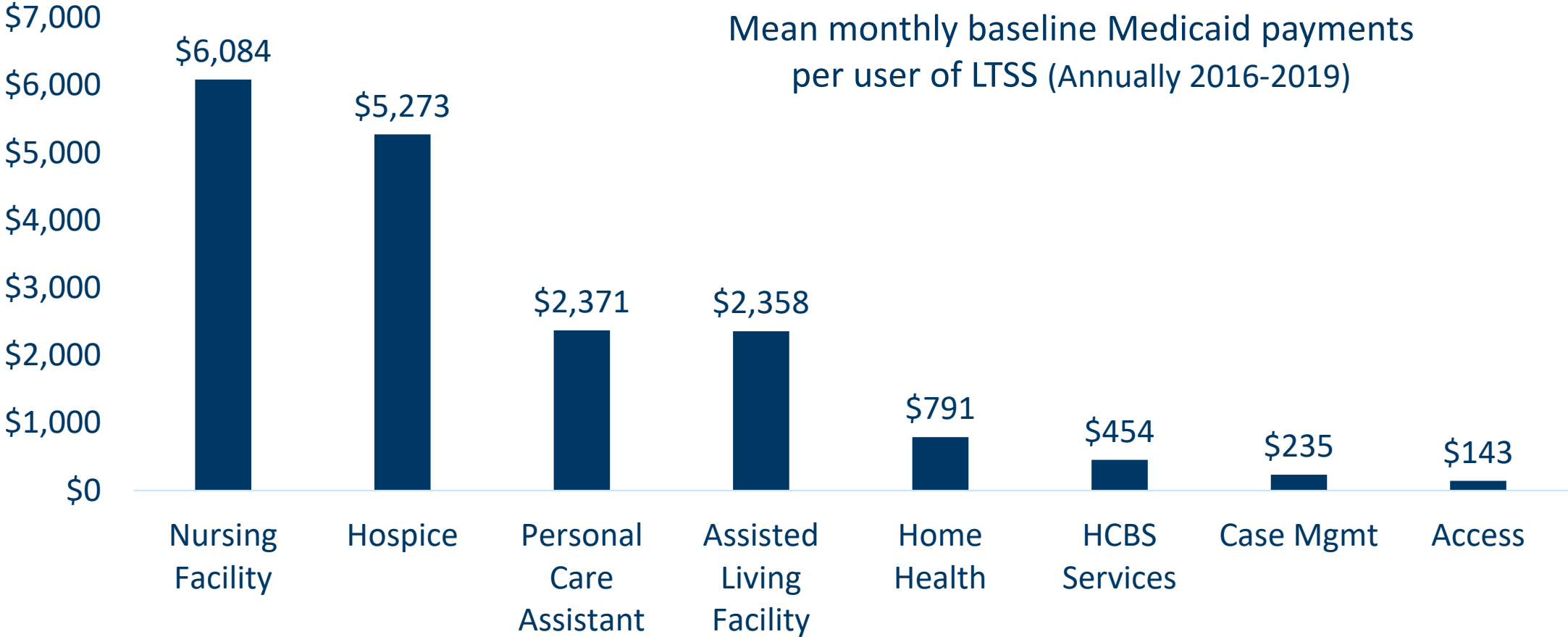
Minnesota LTSS users were more likely to be using HCBS than Nursing facilities or assisted living.

LTSS users were most likely to be using HCBS.
(Annually 2016-2019)

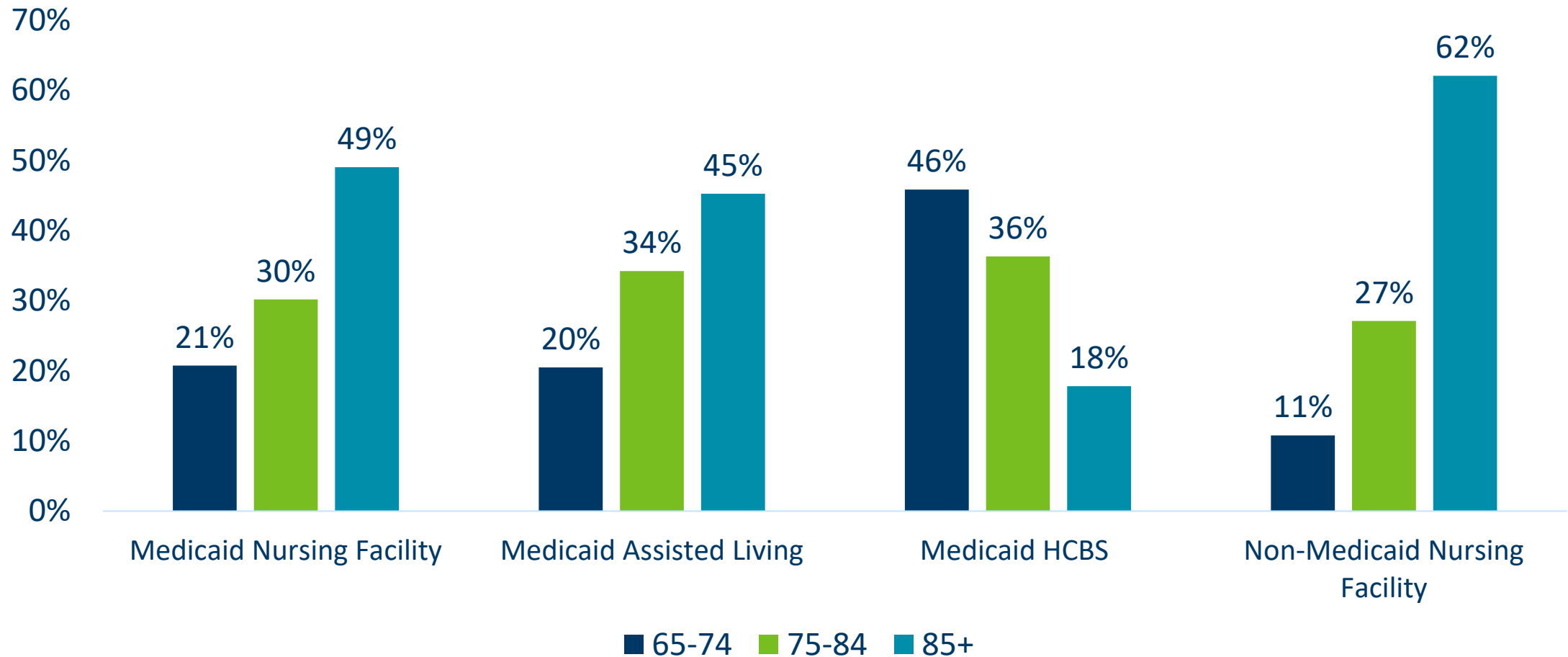


Medicaid HCBS: Elderly Waiver HCBS (32%), Personal Care Assistant w/o a waiver (6%), Alternative Care Waiver (5%)

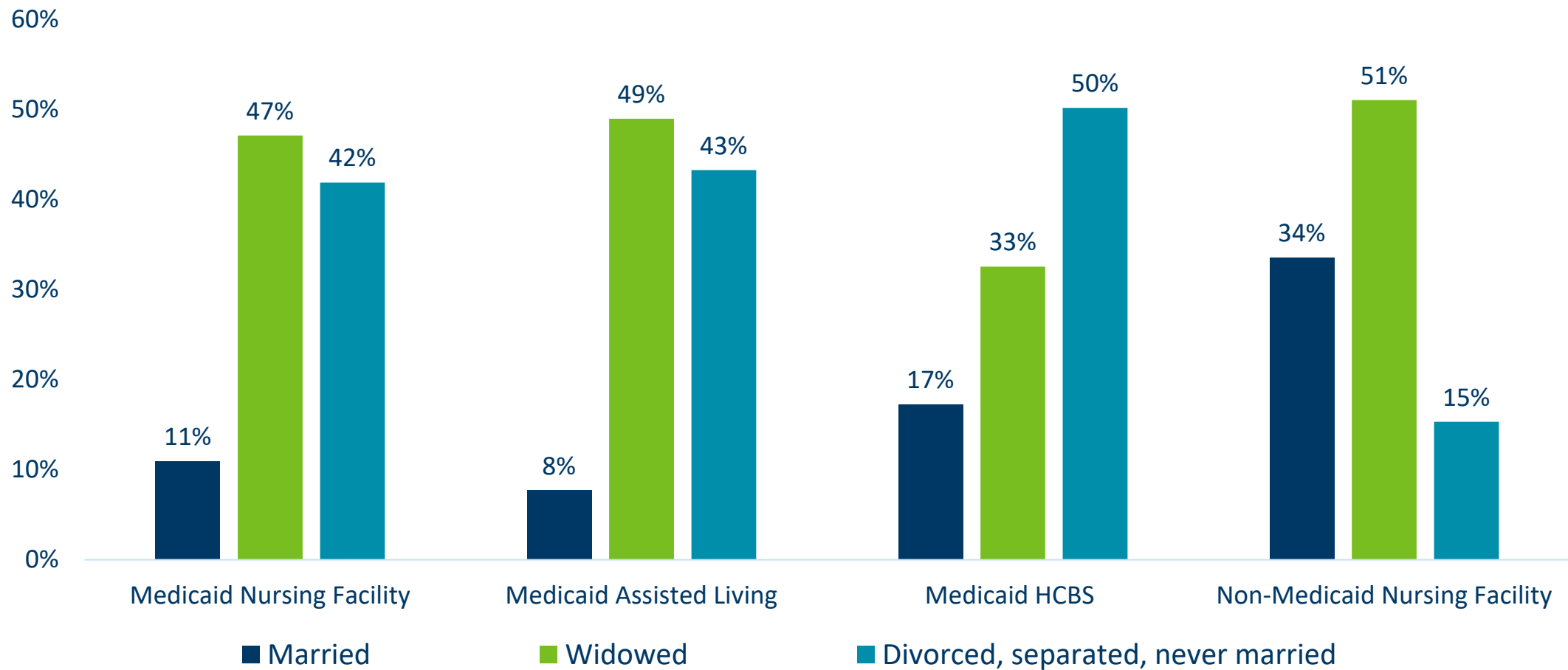
Medicaid payments were much higher for nursing facility residents than for assisted living, personal care, or other HCBS services.



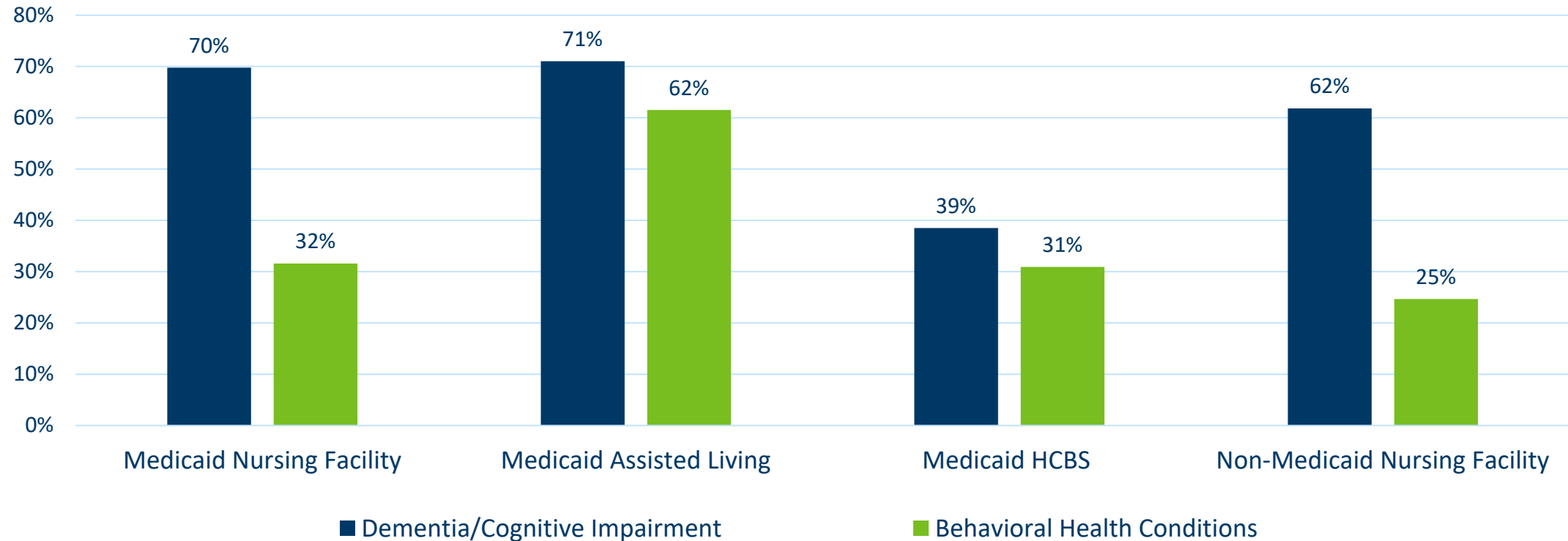
Nursing facility and assisted living facility residents were older than users of HCBS



Medicaid enrollees using LTSS were either widowed, divorced, separated, or single versus married

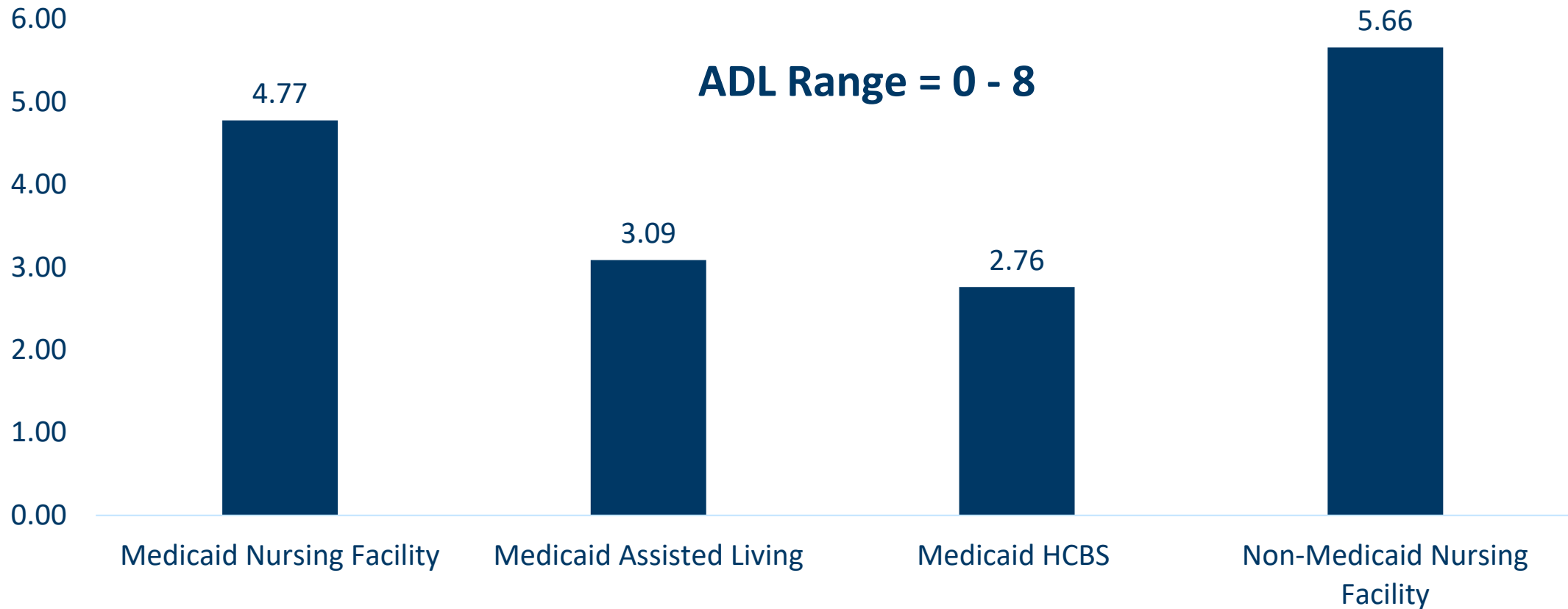


Dementia/Cognitive Impairment was highly prevalent among nursing facility and assisted living facility residents; most assisted living residents also had behavioral health conditions



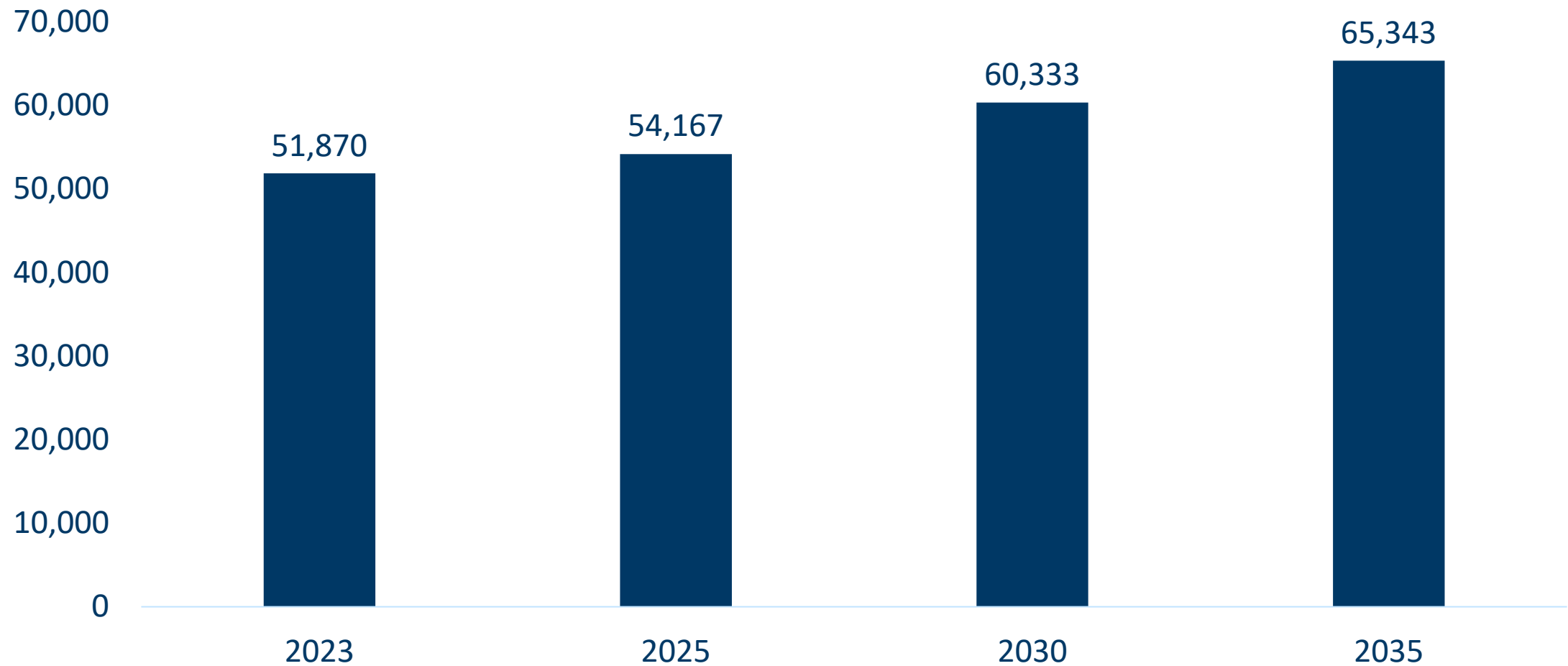
Note: Dementia/Cognitive Impairment includes Alzheimer's or Related Disorder Diagnosis or Assessed Functional Cognitive Impairment.

The average number of ADL dependencies was higher among nursing facility and assisted living facility residents.

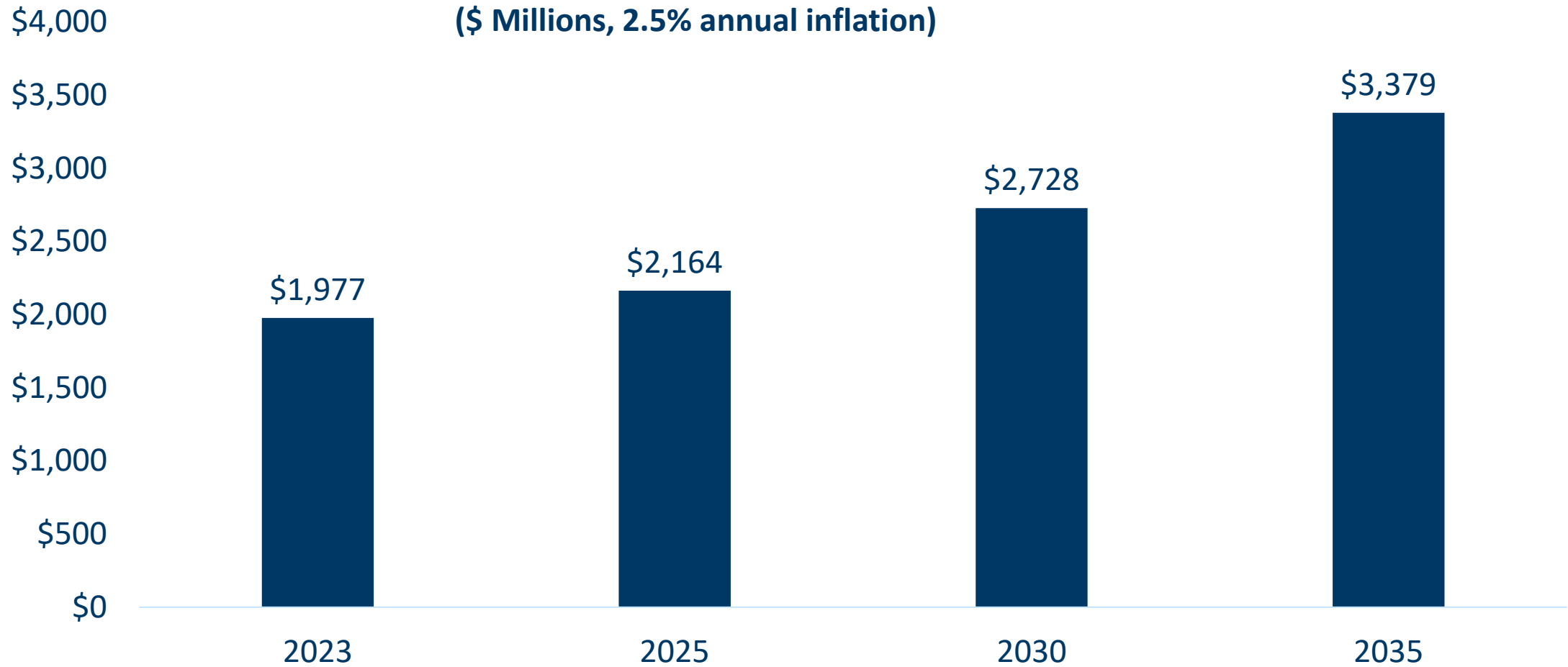


ADL dependencies: extensive or total dependence on others for bed mobility, transferring, eating, walking, bathing, dressing, grooming, and toileting.

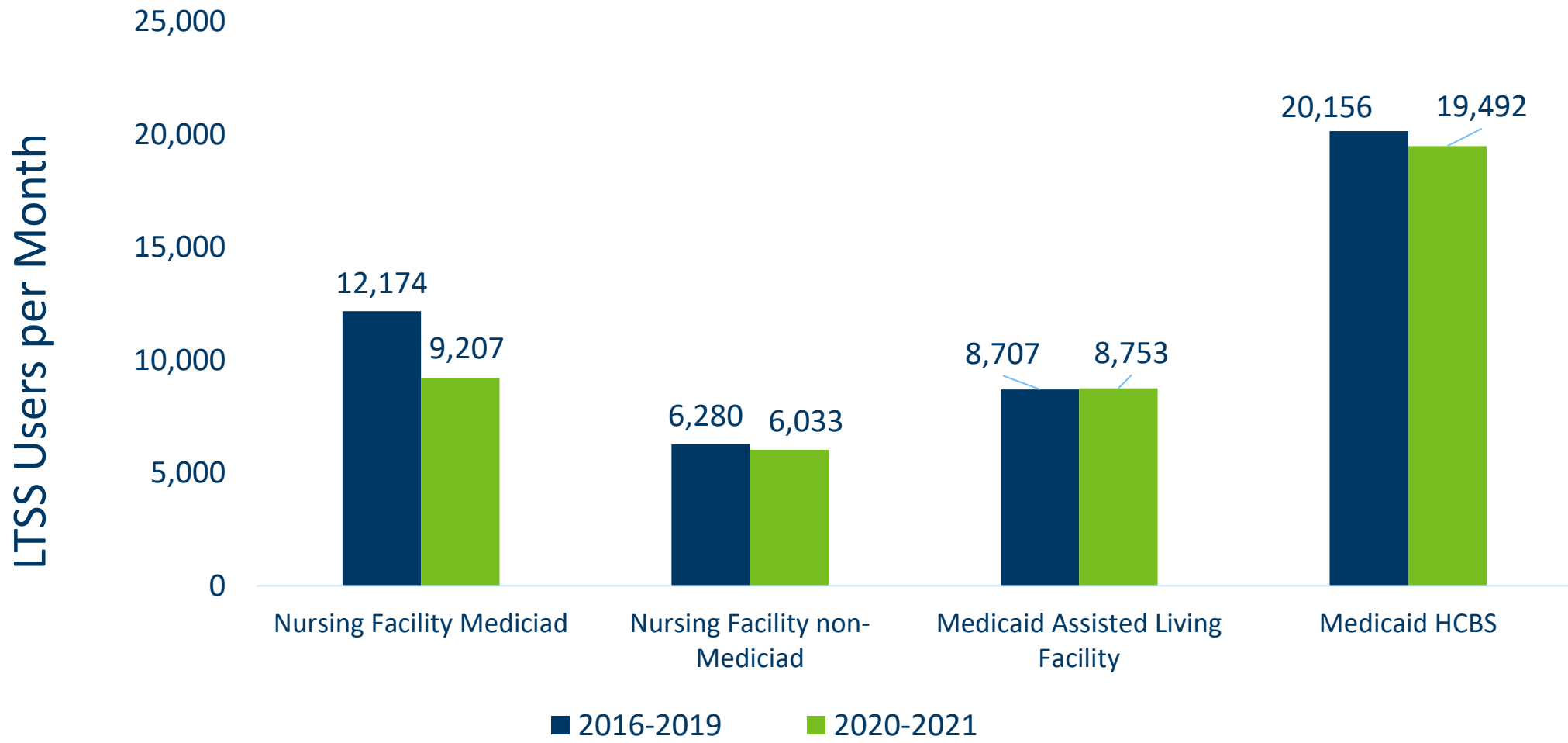
Growth in the older population will result in a projected 26% increase in Medicaid LTSS users from 2023 to 2035.



Growth in LTSS coupled with LTSS cost inflation is projected to increase total annual Medicaid LTSS payments by 71% from 2023-2035



There was a decline in LTSS users per month between the Pre-COVID (2016-2019) and COVID periods (2020-2021), especially among Medicaid nursing facility residents.



- **The LTSS system is complex**
 - Older people are continuously entering and exiting the LTSS system
 - People can make multiple transitions between types of LTSS
 - Medicaid enrollment is dynamic
- **The LTSS population is diverse**
 - Demographic characteristics, ADL dependencies and cognitive status
 - Use of different types of services, nursing facilities, assisted living, and HCBS
 - Medicaid and private payments for LTSS
- **Substantial increases in future costs of LTSS are inevitable**
 - Aging of the older population
 - Combined with anticipated LTSS cost inflation
- **Considerable uncertainty about what the future holds**

- 
- Change -0.09 % Change -1.00
- Minnesota's Long-Term Care Financing
 - **Stakeholder Key Observations & Recommendations**
 - Steve Schoonveld, FSA, MAAA, FTI Consulting

Key Findings and Opportunities Identified by Stakeholders

Care Navigation

- Care navigation and coordination for Minnesotans is essential
- Cross-program coordination is essential to provide access to existing supportive programs
- Early interventions enhances the opportunity for wellness & prevention

Finance

- Establish creative funding streams
- Support self-funded or program funded approaches
- Provide supports and potential tax credits for Minnesotans and their caregivers
- Emphasize partnership between public and private entities
- Private industry incentives

Existing Efforts

- Promote, strengthen and enhance existing MN LTSS programs such as; the Senior Linkage Line, MSHO, Elderly Waiver, and the work of the Area Agencies on Aging
- Leverage the recently passed paid family and medical leave act (PFMLA)
- Currently, a highly fragmented system that does not meet the needs of a majority of older adults.

Education

- Engage older adults and caregivers early
- Expand education on LTSS options
- Provide a central location where educational resources and supports are made available
- Introduce LTSS finance and services earlier through employee assistance or similar programs.

Technology

- Focus on technology, accessibility, and how it may be used to address the workforce crisis
- Strengthen state, county, and local based programs with technology-based solutions

Service Specific

- Supports and funding approaches are clearly defined, accessible, and understandable
- Tailor the services and financing approaches based on individual needs and means across urban, rural, tribal, and cultural differences
- Support the LTSS workforce, including recruitment, retention, and sustainable compensation efforts

Minnesota is Starting from a Great Place

Minnesota (1st) and Washington state (2nd) outperformed all other states in the country, particularly due to strong support for family caregivers, and providing many options in terms of health care providers and long-term care settings.

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CAREGIVING & LONG TERM CARE • SEP 28, 2023

New AARP Scorecard: Minnesota and Washington State Top Rankings for Long-Term Care Services and Supports for Older Americans, Including Family Caregivers

Report Finds Systemic Gaps in Nursing Homes, Home and Community Based-Care, and Support for Family Caregivers

WASHINGTON – AARP’s new Long-Term Services and Supports (LTSS) Scorecard finds that more than three years after the COVID-19 pandemic began, care provided in the United States for older adults and people with disabilities is painfully inadequate. The report finds that major gaps persist in every state, especially related to support for family caregivers, the long-term care workforce, equity in nursing homes, and emergency preparedness.

Minnesota (1st) and Washington state (2nd) outperformed all other states in the country, particularly due to strong support for family caregivers, and providing many options in terms of health care providers and long-term care settings. The lowest scoring states were in the Southeast, with Alabama and West Virginia ranking 50th and 51st, respectively.

“COVID-19 tested our long-term care systems, and they failed. Now is the time to take the lessons we’ve learned to fix them, for the sake of saving lives,” said Susan Reinhard, Senior Vice President, AARP Public Policy Institute. “AARP’s LTSS Scorecard shows some progress and innovation, but there’s still a long way to go before we have systems that allow people to age well and independently for as long as possible and support the nation’s 48 million family caregivers. It’s also clear some emerging issues deserve more attention – from whether nursing homes are prepared to confront natural disasters, to whether they have plans in place to maintain and grow their workforces.”

Additional key findings from the report include:

“No one should struggle to navigate care and services for a loved one or themselves in the 21st century,” continued Reinhard. “But right now, that’s a reality for far too many individuals and their families....”

Brief Description of Study Recommendations

Recommendation 1: Care Navigation & Support Services	Recommendation 2: Medicare Companion Product	Recommendation 3: A Catastrophic-Lite State Based Program
<p>A state developed and centralized care navigation and support structure for all older adults. The purpose is to leverage existing services, provide strong awareness and education, and support families and informal caregivers during their care journeys.</p>	<p>A new insurance product that coordinates and funds care needs emerging in retirement. The program will coordinate care for both acute care thru Medicare and LTSS needs with a complementary LTSS based product. There are two approaches, a voluntary or an obligatory option.</p>	<p>An obligatory state insurance program that would provide funds to help pay for long-lasting, long-term care expenses for five years after a two-year elimination period. The focus is on HCBS but funds would be available for facility care as well.</p>

Recommendation 1: Care Navigation & Support Services

The Concept:

- A publicly sponsored resource to provide care coordination and navigation support to older adults in Minnesota. It is web-based, telephonic, and have opportunities from self-directed to in-person care navigation supports.
- The goal is to provide ways to assist Minnesotans, their families, and their caregivers by providing resources to manage their LTSS needs from the initial diagnosis through higher levels of care needs such as facility-based care.
- A strong self-service portal is needed that will include educational resources to support informal caregivers, access to lists of local care providers, home modification resources, and a connection to community care and supports.
- This provides for a centralized place to support current State and County programs.
- The approach will be an “Aging in Place” marketplace where Minnesotans will use a care “quarterback” to navigate and support successful home and community-based care.

Recommendation 1 Concept



Recommendation 1: Summary of Key Parameters

ACCESS

All older adults are eligible to receive benefits.

BENEFIT VALUE (to older adults and state)

Value of care coordination and support

INDICATIVE COSTS & ELIGIBILITY[†]

Participation is optional.

1. General Revenues approach = 0.8%-1.6% of the state budget (not additive).

2. Premium at 65 approach = < \$25*

3. Payroll tax approach = 0.2%, Avg Monthly Prem = < \$15 per employee for 68.5K of annual salary.

INTEGRATION & STATE BENEFITS

Medicaid savings from increased care coordination, Medicaid waiver support

[†]Costs are estimates of benefit and expense payments and do not account for potential savings due to increased care coordination or Medicaid waiver support.

[‡]Average monthly premium is derived from payroll tax estimate. In the case of a payroll tax, actual individual contributions would vary by income level.

*Monthly premiums at age 65 are assumed to be indexed at 3% per year, consistent with inflation protection provided by the benefits in Options 2 and 3.

Recommendation 1: Care Navigation & Support Services

The Potential Benefits:

- Supports and enables informal and family caregiving with training and education needs.
- Reduces the demand on formal caregivers.
- Supports navigating the funding sources between acute care insurance and LTSS programs and products.
- Educates the family caregivers of their own LTSS risks. Encourages them to plan for their own needs.
- Providing a resource for ancillary services, meals, transportation, chore services, and other needs.
- Home monitoring and other technology solutions can support the caregiver and the care receiver.
- A focus on caregiver health and stress is possible so they may remain in the workforce.
- Primary Care Physicians and their staff may reference the resource to support their patients.
- The service can be employed as a resource for hospital discharge planning.
- An opportunity for a marketplace for insurance products that address LTSS funding needs and provide for a robust market for “red box” Minnesotans.

Additional Option:

- A \$15,000 lifetime benefit to support “Aging in Place” needs.

Key Questions Received on the Care Navigation & Support Services Recommendation

How is the service structured? Will older adults and their families be required to enroll in a care coordination service?

How would the service enable access to state and community programs?

Would this service be developed by private companies or state departments?

Recommendation 2: Medicare Companion Products

The Concept:

- Building upon the successful Managed LTSS (MLTSS) program in Minnesota called Managed Senior Health Options (MSHO), this approach seeks to expand coordinated care to ALL older adults by bringing MSHO-like elements “upstream”.
- In a similar way, Minnesotans would receive care through coordination between their Medicare plans and a public or private based long-term care plan.
- Can be delivered as either:
 - Market Option: Expand available insurance options by leveraging the care coordination of Medicare plans while linked to a LTSS based insurance product. Incentives may be developed to purchase, and a market may be created with carriers, employers, and advisors participating.
 - Obligatory Option: Develop a state sponsored obligatory program requiring all Minnesotans by age 65 to have at least a year of coverage. Minnesota’s older adults that are enrolled in Medicaid would automatically meet this purchase requirement. Similar market option opportunities would be created.

Recommendation 2: Summary of Key Parameters

ACCESS

90% of older adults needing care are expected to receive benefits.

BENEFIT VALUE

Benefits would pay for 15% of the average lifetime care need.

INDICATIVE COSTS & ELIGIBILITY[†]

Obligatory option:

1. Payroll tax approach = 0.5% - 0.9%, Avg Monthly Prem = \$40 per employee for 68.5K of annual salary.

2. Premium at 65 approach = \$120*

3. General Revenues approach = 2% - 5%

INTEGRATION

Medicaid savings from increased care coordination, Medicaid waiver support. Savings from direct benefit payments

[†]Costs are estimates of benefit and expense payments and do not account for potential savings due to increased care coordination or Medicaid waiver support.

[‡]Average monthly premium is derived from payroll tax estimate. In the case of a payroll tax, actual individual contributions would vary by income level.

*Monthly premiums at age 65 are assumed to be indexed at 3% per year, consistent with inflation protection provided by the benefits in Options 2 and 3.

Recommendation 2: Medicare Companion Products

The Potential Benefits:

- Care coordinated across the continuum from the physician's office, to the hospital, to the home for LTSS needs. A timely, prevention focused, and sustainable "Aging in Place" approach to care collaboration.
- Expands participation in the LTC market by middle income consumers.
- Increased carrier participation within the LTSS market and supported by employers and distribution.
- Provides a benefit on the front-end where "red box" Minnesotans need the most support.
- Avoids the issues of a payroll tax approach where participants may lose or reduce their coverage if they leave the state and increases who can participate by removing the employee-based approach.
- Coordination across the care continuum reduces the duplicative efforts of each product and may reduce both acute and LTSS claim costs and administrative expenses. Hospital re-admission rates may improve when home care is promptly coordinated.
- Aligns incentivizes and enables stakeholders including government entities, providers, insurers, and families to find unique structures not available to segregated product approaches and/or single pay LTSS designs.

Additional Option:

- Buy in to MSHO by "red box" participants.

What is the role for employers and advisors with this product?

What is an LTSS product? Under the obligatory approach, what would qualify as having coverage?

Under the obligatory approach, what potential approaches are there to subsidize costs for top of the “red box” older adults?

What potential approaches may develop under the market approach to provide LTC insurance for middle market older adults?

Recommendation 3: A Catastrophic-Lite State Based Program

The Concept:

- This obligatory program is funded by a payroll tax and provides benefits for eligible participants for up to 5 years of care following satisfaction of a 2-year elimination period.
- A payroll tax would be assessed on all w-2 income for those 18 and older. Eligibility would be vested for participants that contribute for at least 10 years with limited gaps allowed. Benefit eligibility would be the tax qualified definition requiring two of six ADLs or severe cognitive impairment.
- No exemption process is anticipated. Spouses of vested participants are covered.
- The goal is to reduce the impact of long-duration claims on spouses and families and to reduce the reliance on Medicaid programs.

Recommendation 3: Summary of Key Parameters

ACCESS

41% of older adults needing care are expected to receive benefits.

BENEFIT VALUE

Benefits would pay for 27% of average lifetime care need.

INDICATIVE COSTS & ELIGIBILITY[†]

1. Payroll tax approach = 0.6% - 1.2%, Avg Monthly Prem = \$55 per employee for 68.5K of annual salary.

2. Premium at 65 approach = \$150*

3. General Revenues approach = 3% - 7%

INTEGRATION

Medicaid savings from increased care coordination, Medicaid waiver support. Savings from direct benefit payments.

[†]Costs are estimates of benefit and expense payments and do not account for potential savings due to increased care coordination or Medicaid waiver support.

[‡]Average monthly premium is derived from payroll tax estimate. In the case of a payroll tax, actual individual contributions would vary by income level.

*Monthly premiums at age 65 are assumed to be indexed at 3% per year, consistent with inflation protection provided by the benefits in Options 2 and 3.

Proposed Recommendation 3: A Catastrophic-Lite State Based Program

The Potential Benefits:

- Minnesota's older adults may see this as a means to de-risk themselves of the long duration claim and seek protection or pursue a plan for the first 2 years of care needs.
- Opportunities for the market to innovate with creative funding approaches may increase as additional products such as short-term care, life and annuity hybrid products, supplemental health, and personal and tax-advantaged savings, can be used to fill the gap in coverage.
- Potential for private collaborations of the risk through cost sharing arrangements between the Cat-Lite program and insurers and provider organizations.
- May enable payroll tax approaches that balance the contributions of initial entrants at older ages with new entrants. For example, the initial 18 year-old cohort compared to age 55 year-old cohort. Also explore reducing the payroll tax on low-income participants and capping the total tax collected on all participants.
- Opportunity to develop approaches that give tax credits for those that purchase and retain applicable supplemental products.

Alternative Option:

- Unlimited benefit period after a 2-year elimination period.

At launch, 55 year-olds would pay the payroll tax for a minimum 10 years. This may increase the overall rate. What may be done?

What alternatives were discussed to the payroll tax approach for this benefit? How could current older adults be covered?

How would Federal Medicaid savings under this program potentially be repurposed to support Minnesota dual eligibles?

Essential Criteria for Evaluating LTSS Proposals

	Description
Access/ Equity of Access	Improves access to and usage of LTSS by Minnesota's older adult population.
Costs and Efficiency	The system improves efficiency and generates savings for public programs, consumers and their families/caregivers.
Benefits	Total benefits are reasonable in relation to the total costs borne by the consumers across the system of public/private/personal approaches.
Sustainable	The funding mechanism is sustainable and adjusts to changing economics, demographic eras, changes in family composition, and care support conditions. Sustainability applies across all stakeholder groups including consumers (out of pocket costs), public and private programs (solvency), and care providers (reasonable reimbursement).
Systemic Change	Provides fundamental positive changes to the way LTSS funding and service delivery is coordinated in Minnesota.
Feasibility	Implementation of the financing program is feasible and with limited obstacles and limited administrative costs to implement.
Integration	The care and supports, financing, and care coordination/management between private, public and other sources should be part of an integrated system.
Incentivization	The financing approach encourages support for care, prevention, and wellness initiatives. The approach aligns stakeholder needs. The system promotes consumer responsibility.
Adaptable and Supportive	The system is flexible and adaptable related to market conditions, demographic shifts, and availability of care providers and resources. The system is responsive to cultural needs and embraces caregiving approaches of different cultures and family composition.
Understandable and Marketable	Eligibility for LTSS benefits, the financing approach, and the processes are simpler, clearer, and more understandable to consumers and their families/caregivers, providers, employers, and other stakeholders.

Essential Criteria Evaluation of the Recommendations

Stakeholders also rated the potential for improvement over the current LTSS access and funding system following the developed list of essential criteria objectives. A zero implies no improvement, +1 through +3 implies modest to significant improvement:

	Rec 1	Rec 2	Rec 3
Access/Equity of Access	+2.36	+1.83	+1.67
Costs and Efficiency	+2.00	+1.83	+1.56
Benefits	+1.71	+1.92	+2.22
Sustainable	+2.29	+2.17	+1.89
Systemic Change	+1.79	+2.08	+2.22
Feasibility	+2.14	+1.17	+1.22
Integration	+1.79	+2.08	+1.78
Incentivization	+1.57	+1.42	+1.56
Adaptable and Supportive	+2.07	+1.50	+1.22
Understandable and Marketable	+2.08	+1.50	+1.56

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The Reports: <https://mn.gov/dhs/ownyourfuture/reports/>

**Demographic, Social, and Economic
Characteristics of the General Population
of Minnesotans aged 65 and Older**

ACS Final Report

Prepared by: Lynn A. Blewett, PhD
State Health Access Data Assistance Center
University of Minnesota, School of Public Health

**The Own Your Future
LTSS Funding and
Services Initiative**

Options to Increase Access to Long-
Term Care Financing, Services, and
Supports in Minnesota

October 2023

Prepared by FTI Consulting, Inc, Actuarial Research
Corporation, and the Altarum Institute, for the Minnesota
Department of Human Services Aging and Disability Services
Administration

- The marathon has just begun!
 - Continuing our community engagement efforts to gather feedback from our partners on the different recommendations discussed in the report
- The finish line
 - 2025 Legislative Proposal

Discussion

Thank You!

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**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**

**Greg Arling, Zachary Hass and Dongjuan Xu
Purdue University School of Nursing**

**Lynn Blewett and Mark Woodhouse
State Health Access Data Assistance Center (*SHADAC*)
University of Minnesota School of Public Health**

November 27, 2023

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.

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Chapter 1 Introduction

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.

Project Objectives

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 facilities, Medicaid assisted living, and Medicaid home and community-based services (HCBS).
 - Describe demographic characteristics and health status, marital status race/ethnicity of people participating in LTSS.
 - Estimate the COVID-19 impact on LTSS utilization.
- Develop 10-year projections for LTSS in Minnesota.
 - 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 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

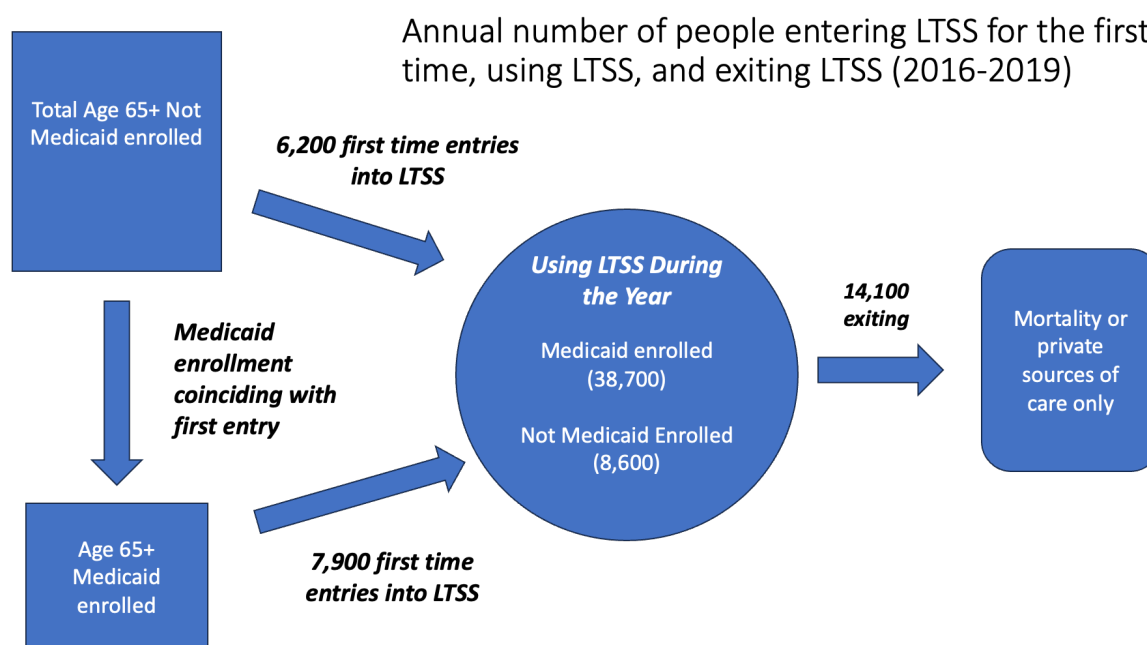
Population by Medicaid Enrollment 2019	Number	% of Total Age 65 and Older
Total Population Aged 65 and Older	920,675	100%
Medicaid Enrolled	74,795	8%
Not Medicaid Enrolled	845,880	92%
LTSS Population	46,610	5%
Medicaid Enrolled	40,457	4%
Not Medicaid Enrolled	6,153	1%

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

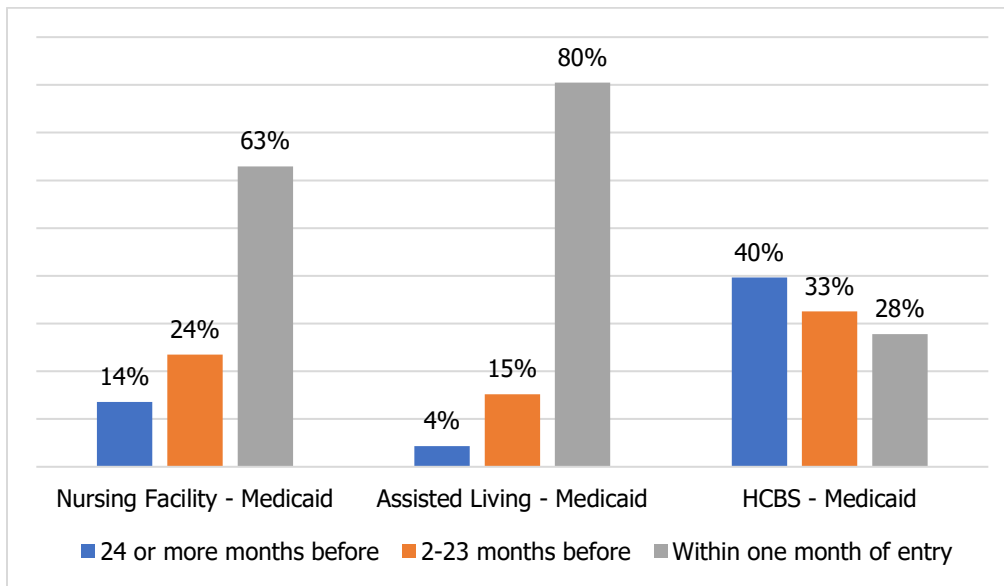
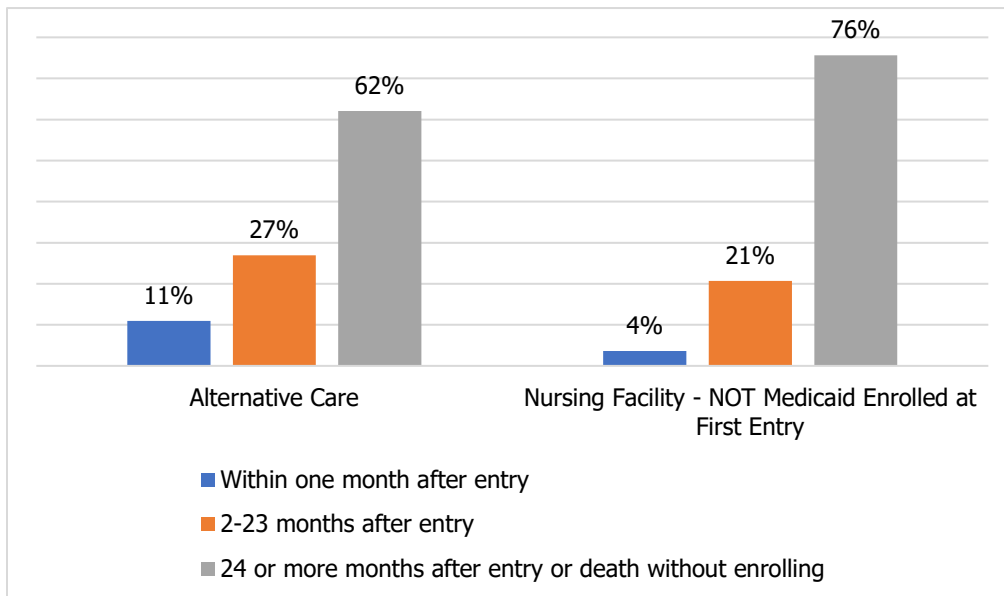


Figure 3.3 Months to Medicaid Enrollment for those Not Medicaid Enrolled at First Entry



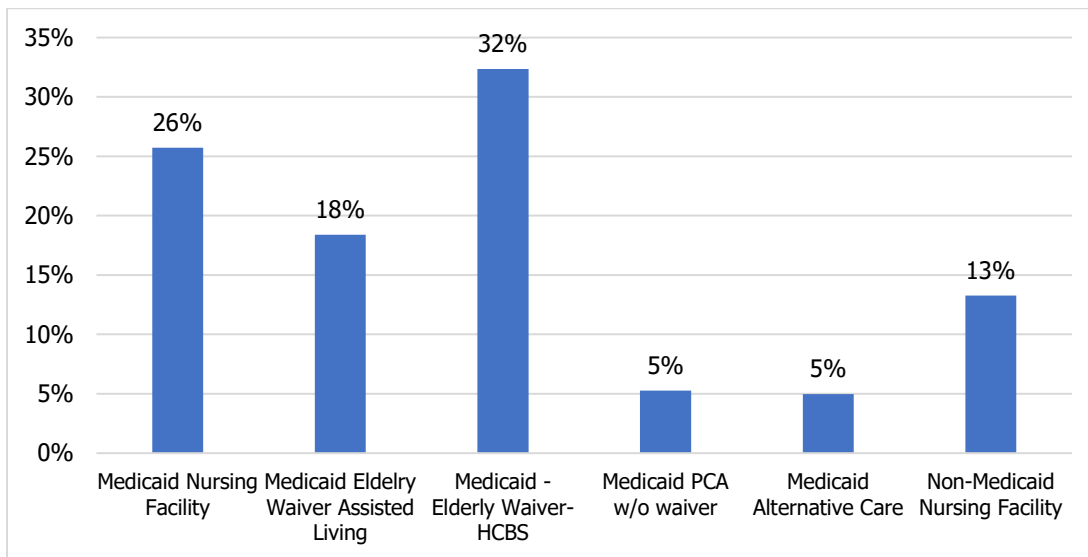
Distribution of LTSS Users Across Programs and Settings

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)

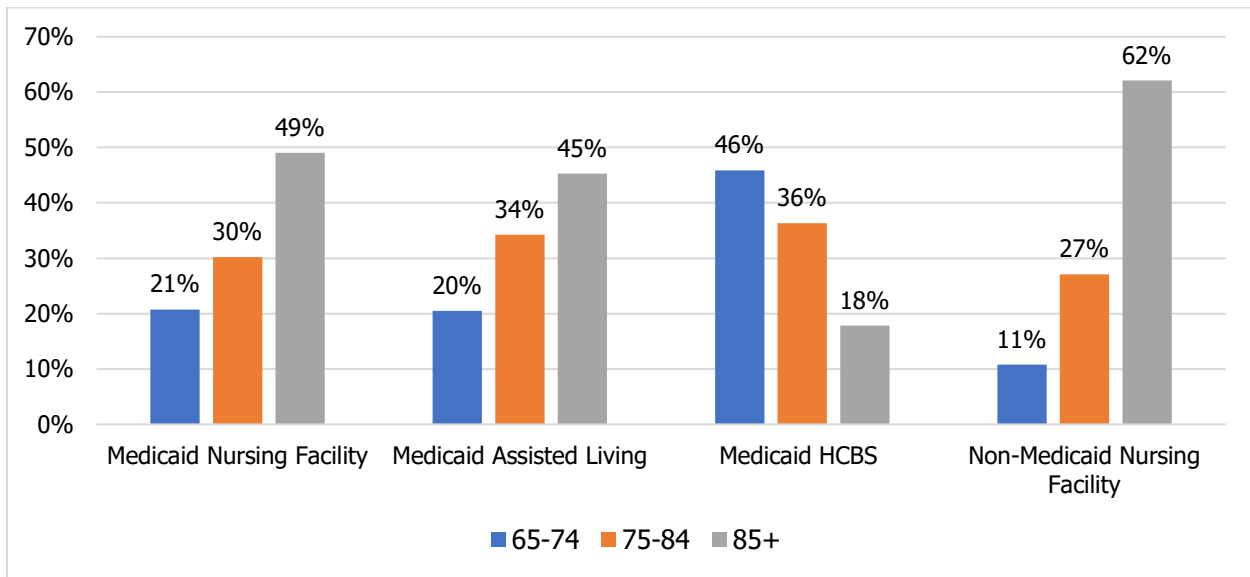


Note: Annual Average = 47,317 LTSS users

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.

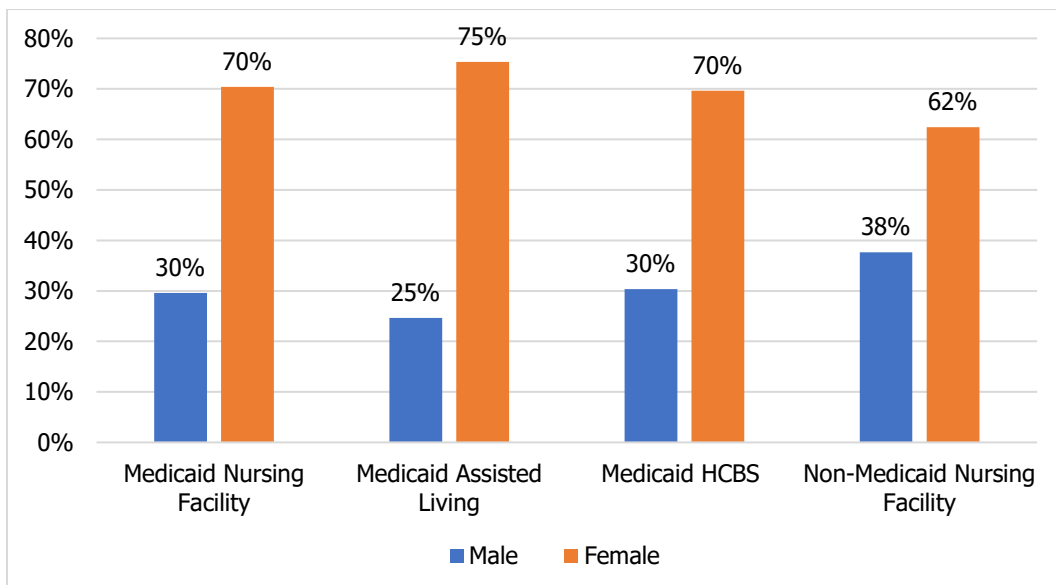
Figure 3.5 Annual LTSS Users of Care by Age (2016-2019)



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

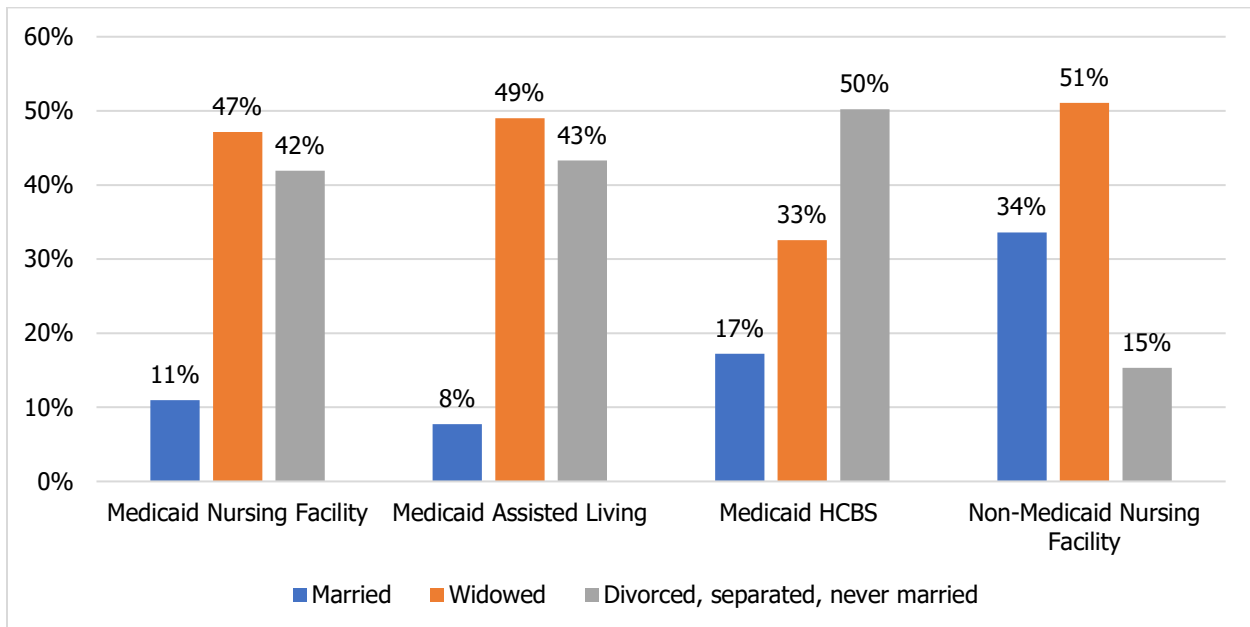
Users of all types of LTSS were predominately female (Figure 3.6) and unmarried (Figure 3.7). People who were widowed made up the largest percentage of LTSS users in all of the settings. High percentages of people enrolled in Medicaid also were either divorced, separated, or never married. The largest 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

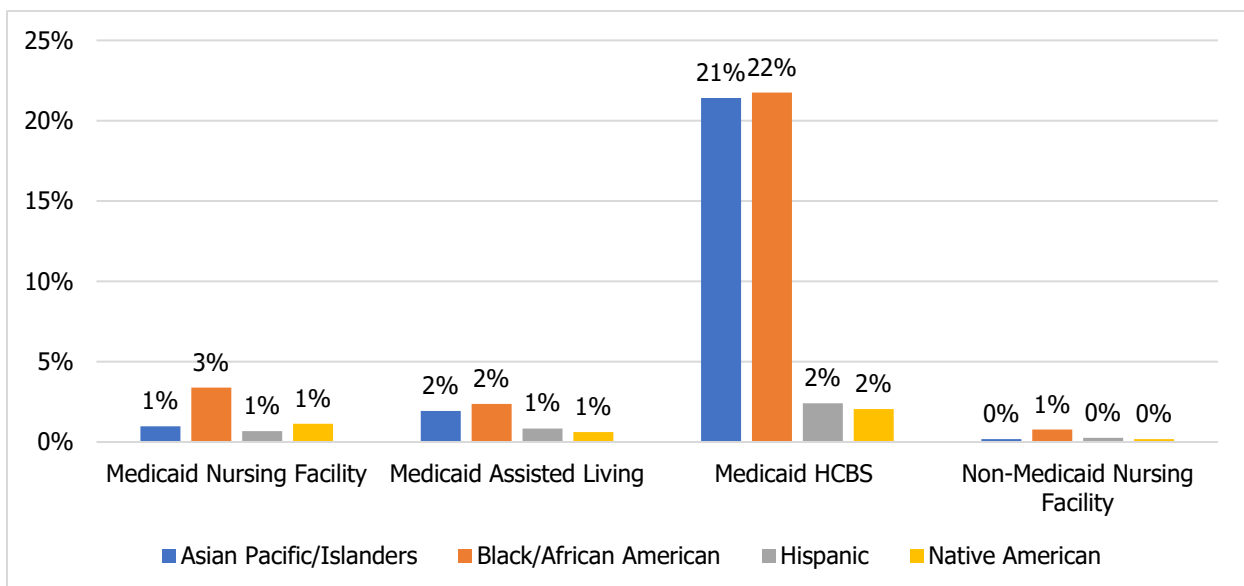
Figure 3.7 Annual LTSS Users of Care by Marital Status (2016-2019)



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)

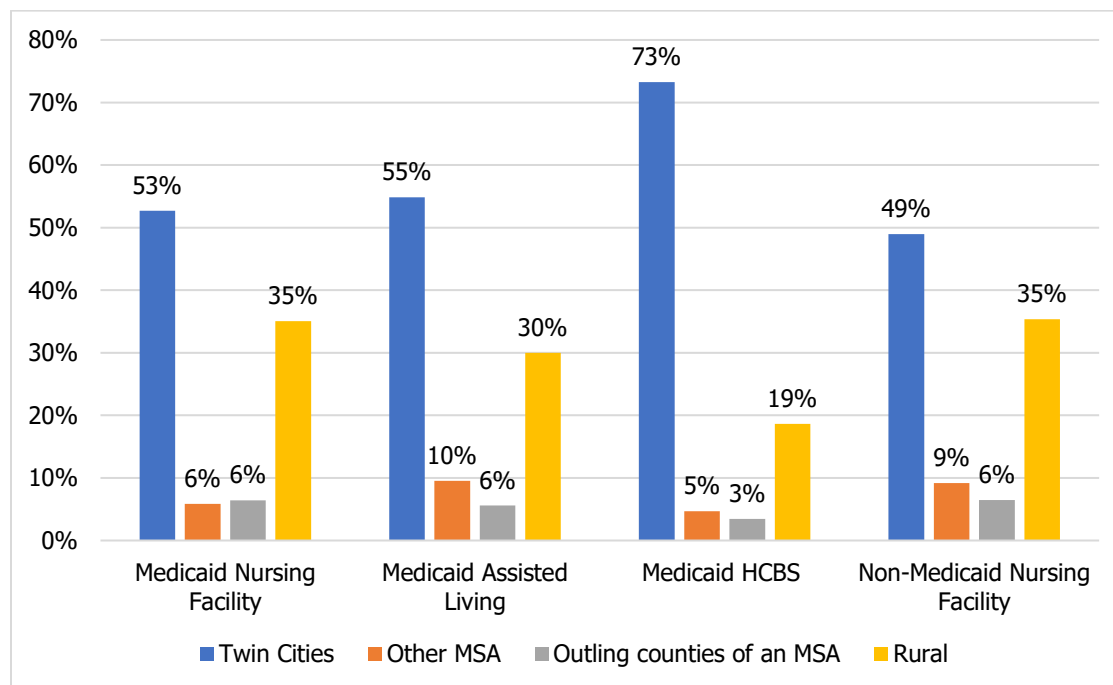


Note: Medicaid HCBS: Elderly Waiver-HCBS, PCA w/o a waiver, and Alternative Care Waiver

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)

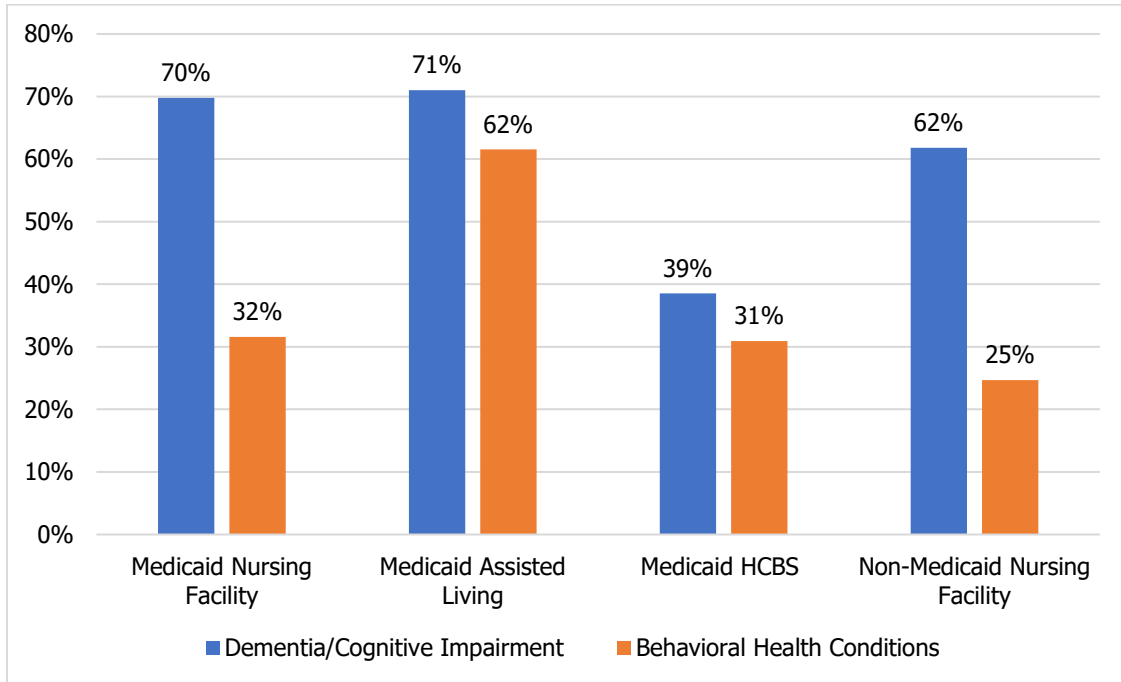


Figure 3.11 Combinations of Dementia/Cognitive Impairment (CI) and Behavioral Health Conditions (Annually 2016-2019)

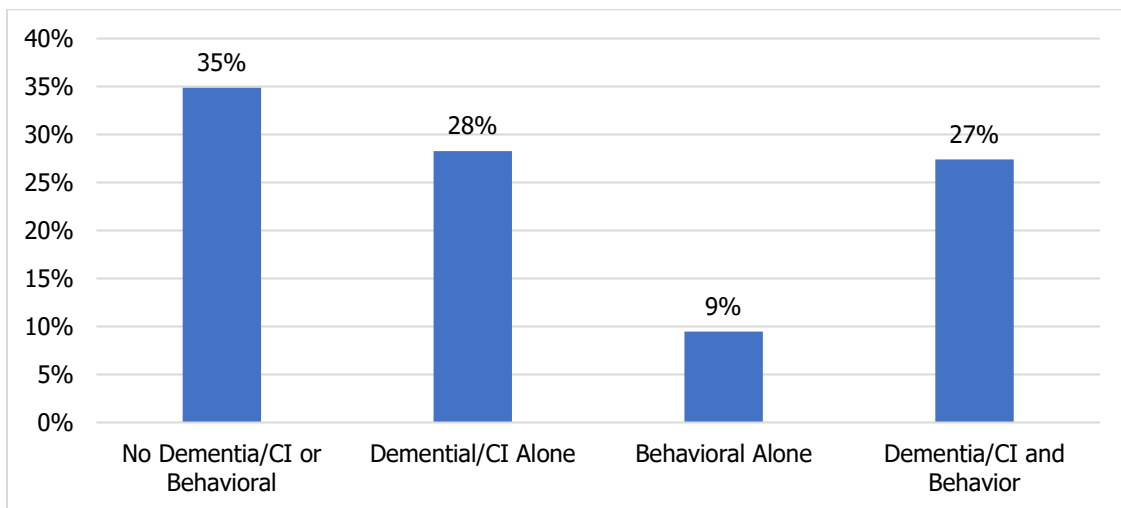


Figure 3.12 Combinations of Dementia/Cognitive Impairment and Behavioral Health Conditions by LTSS Type (Annually 2016-2019)

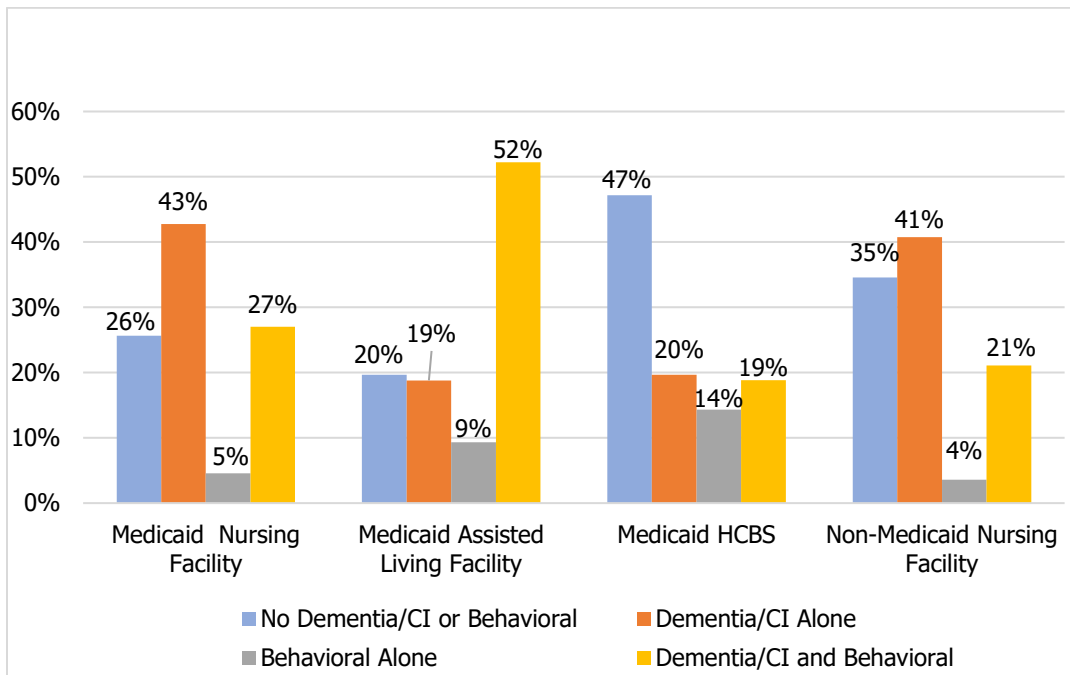


Figure 3.13 Annual LTSS Users of Care by Average Number ADL Dependencies, Range = 0-8 (Annually 2016-2019)

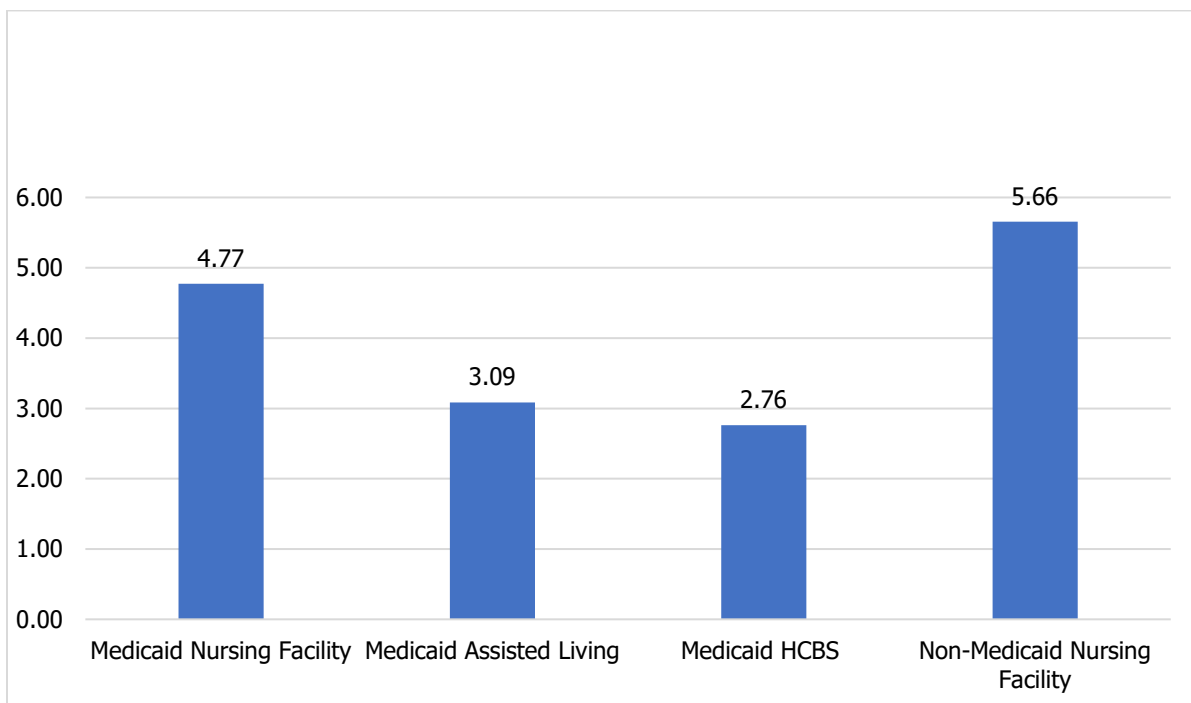


Table 3.2 shows the combinations of dementia/cognitive impairment and ADL dependency. The users of Medicaid HCBS stood out as having the highest percentage of people with 2 or fewer ADL dependencies. Most of these people were absent dementia/cognitive impairment. Residents of assisted living facilities 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)

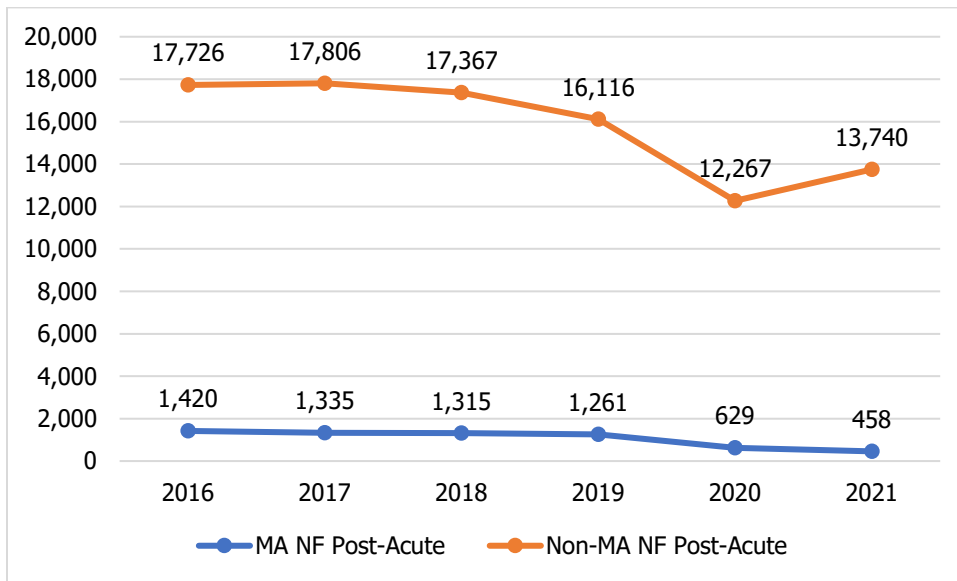


Figure 4.2 Number of New Entries with Nursing Facility Stays 90 Days or Longer

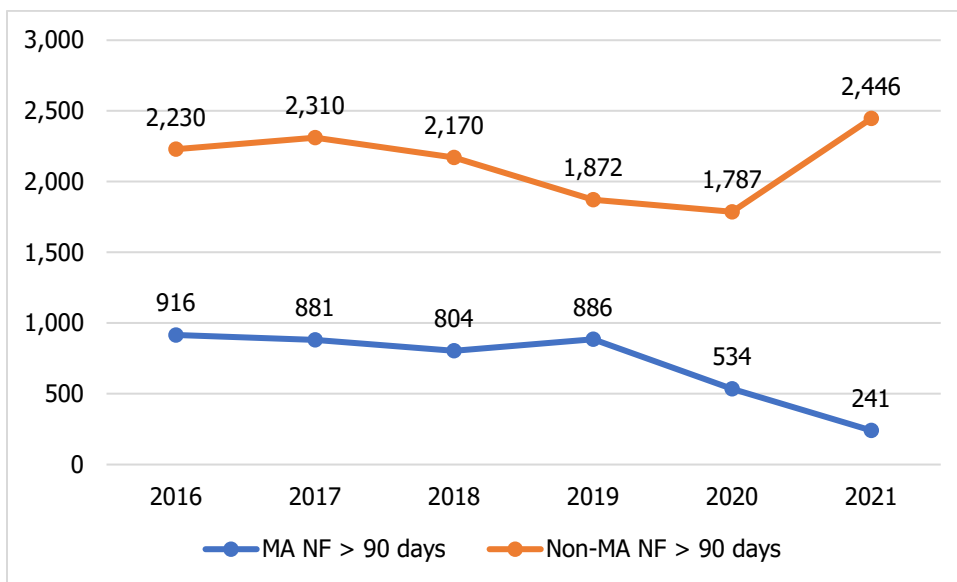
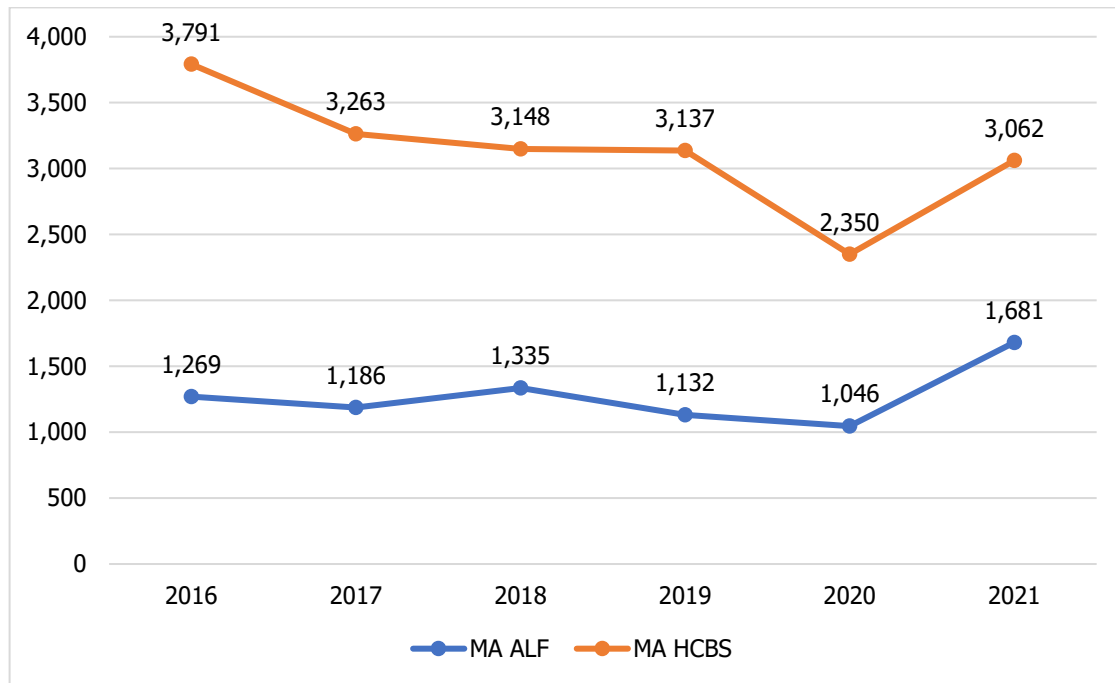


Figure 4.3 Number of New Entries to Medicaid Assisted Living and Medicaid HCBS



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

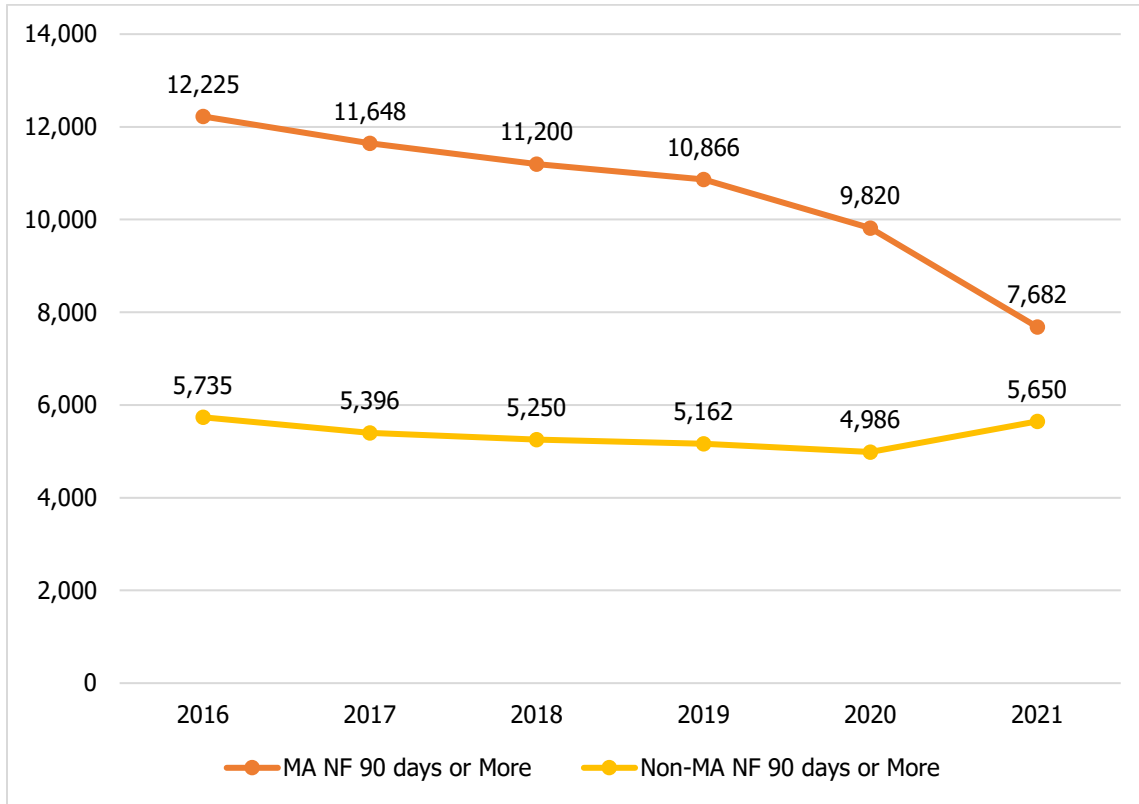
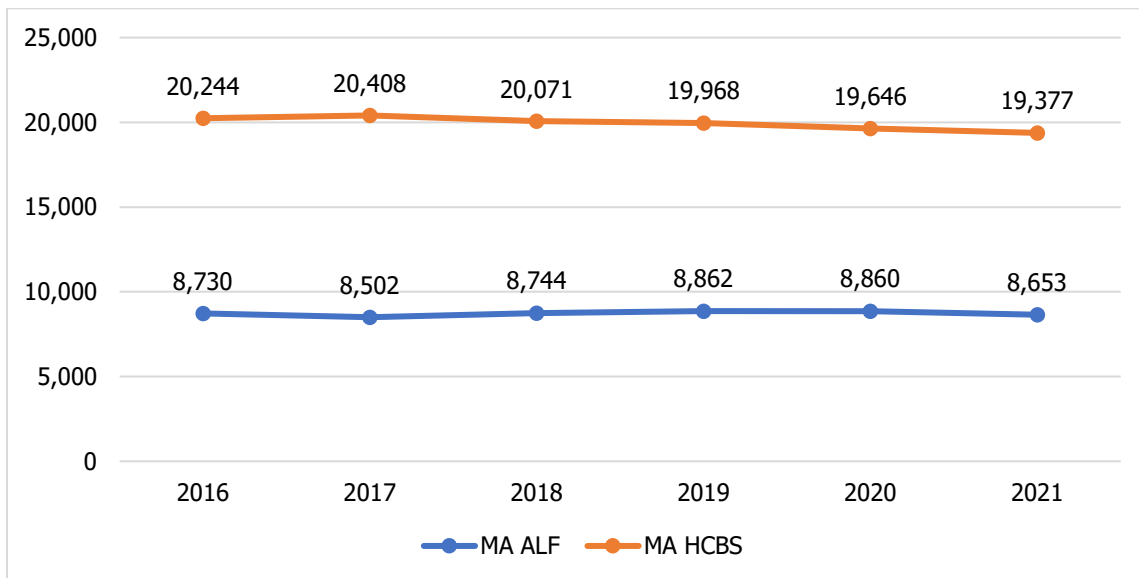


Figure 4.5 Number of Annual Medicaid Assisted Living and Medicaid HCBS Users



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.

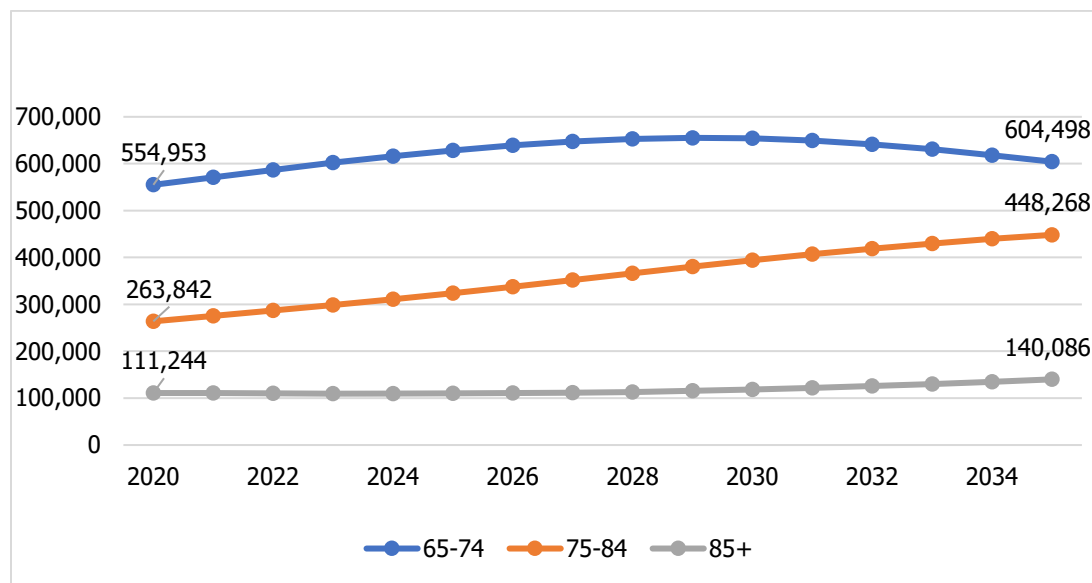
Demographic Projections and Baseline LTSS Utilization and Payments

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

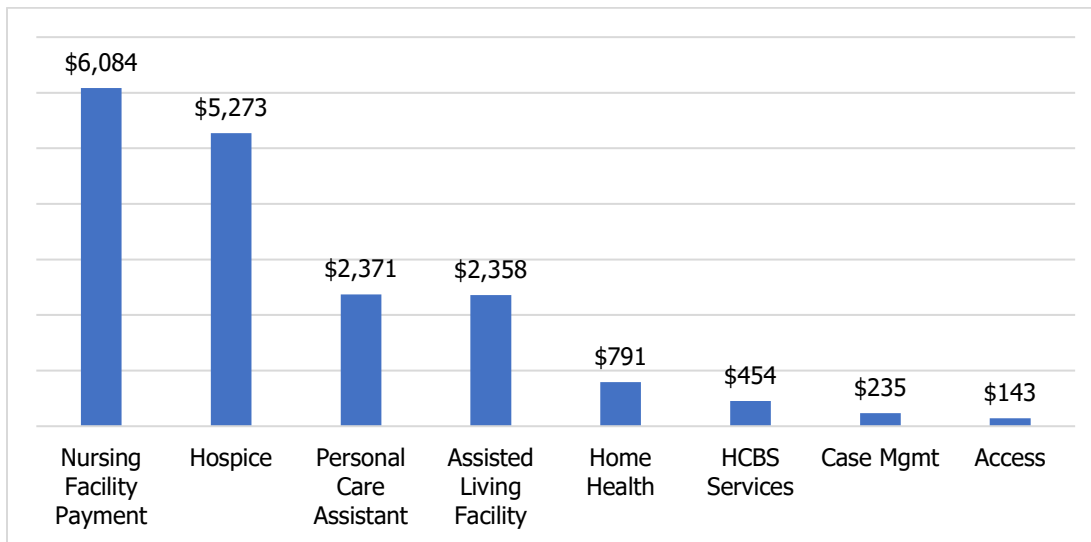
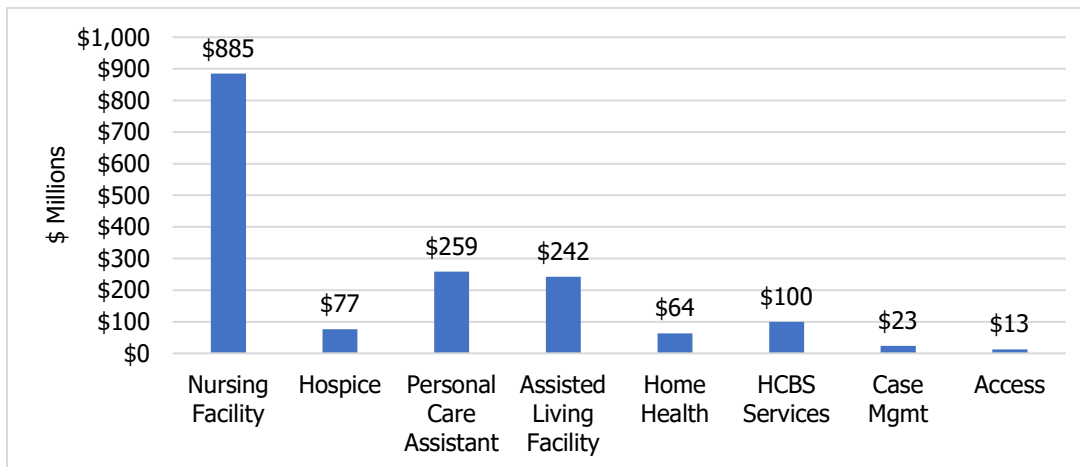


Figure 5.3 Total Annual Medicaid Payments (\$ Millions) (2016-2019)



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

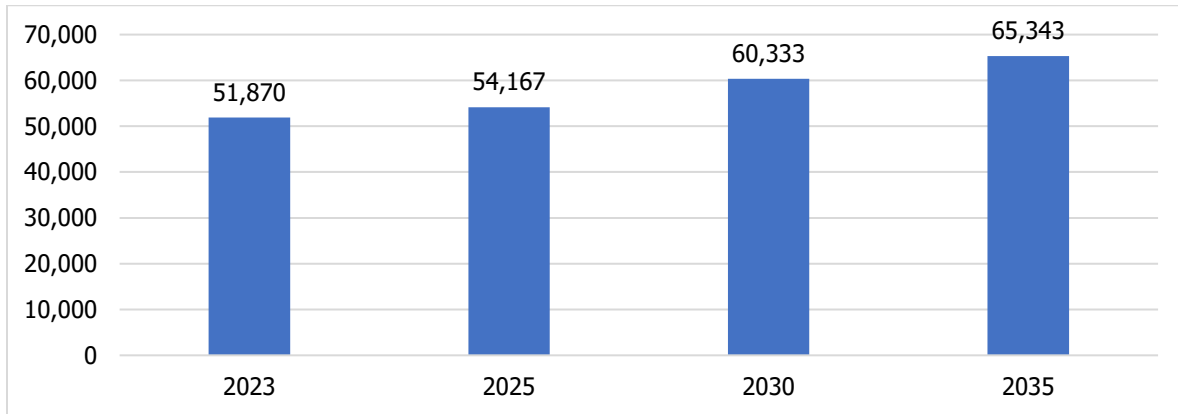


Figure 5.5 Projected Total Number of Annual LTSS Users by Age

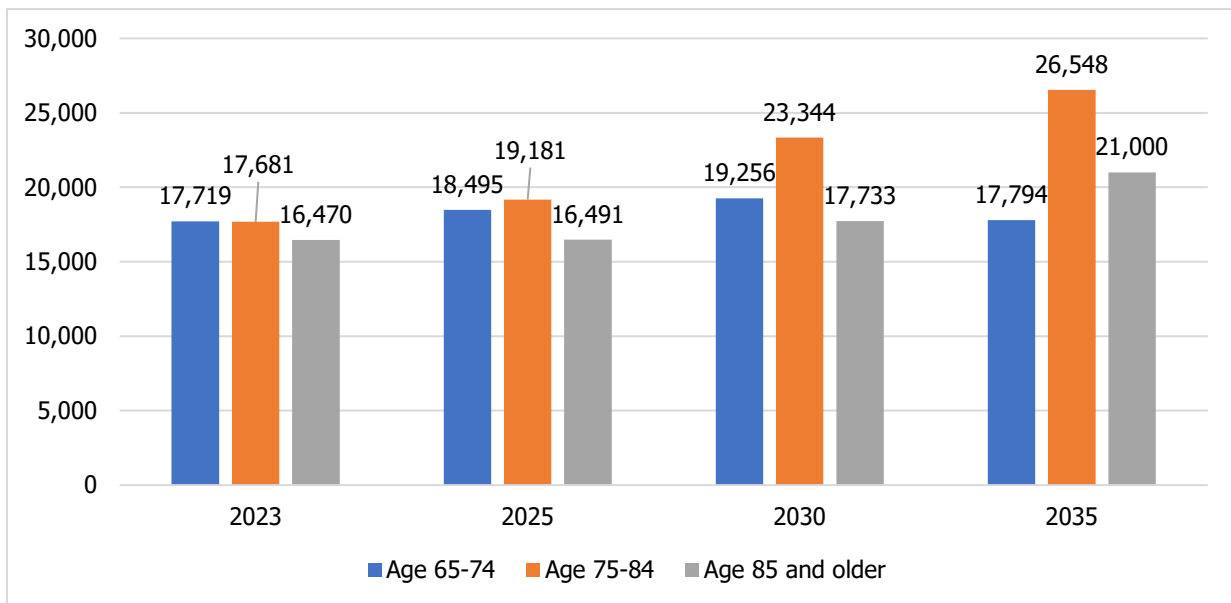


Figure 5.6 Projected Annual Users of Nursing Facilities and Assisted Living Facilities by Year

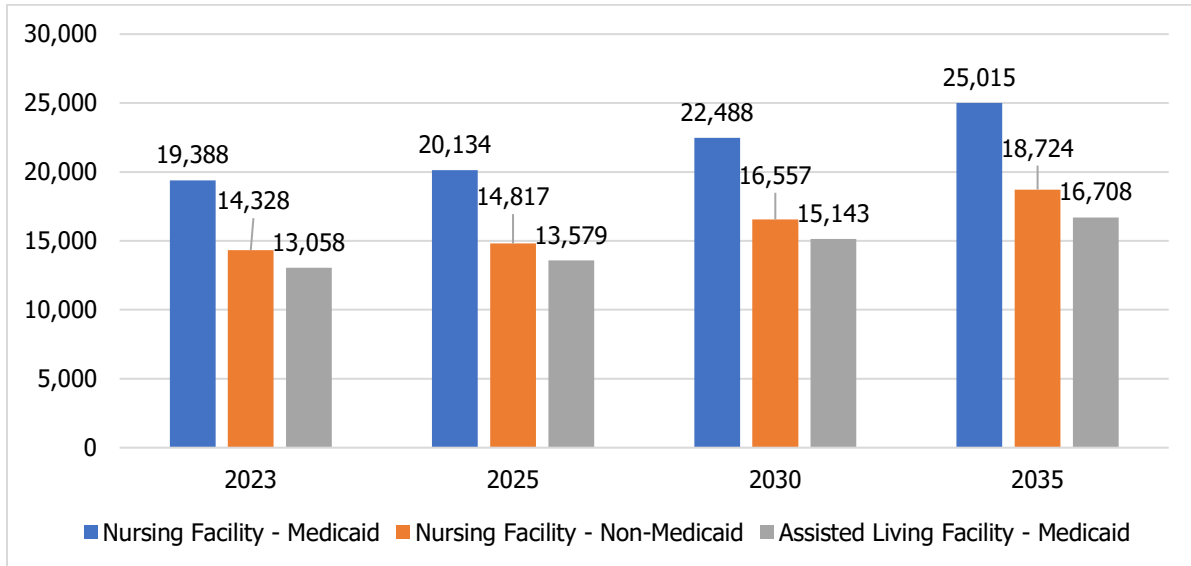
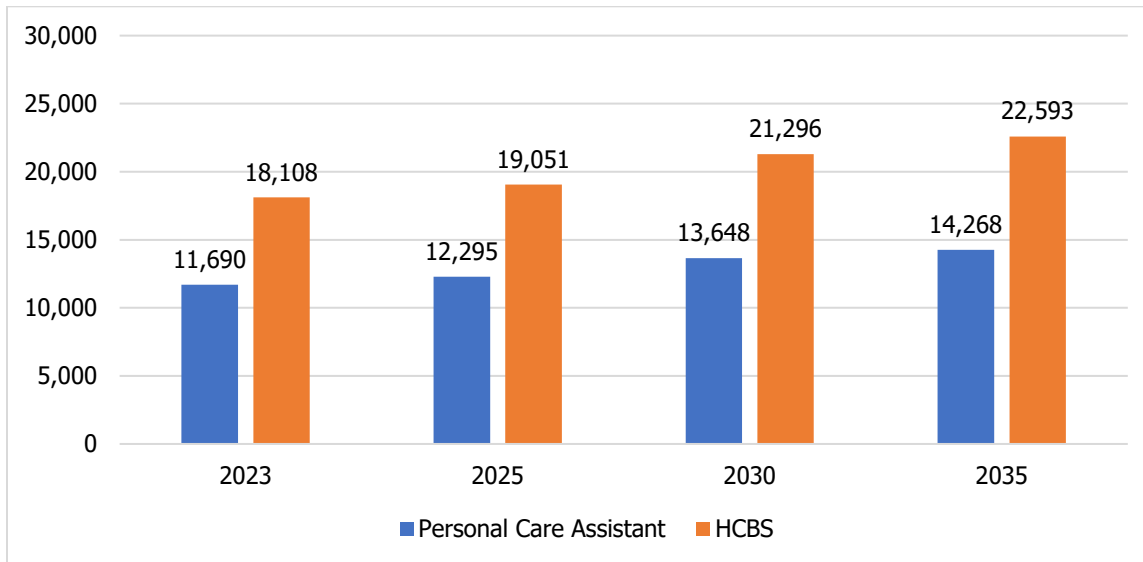


Figure 5.7 Projected Annual Users of Personal Care Assistant or Other Home and Community-Based (HCBS) Services by Year



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

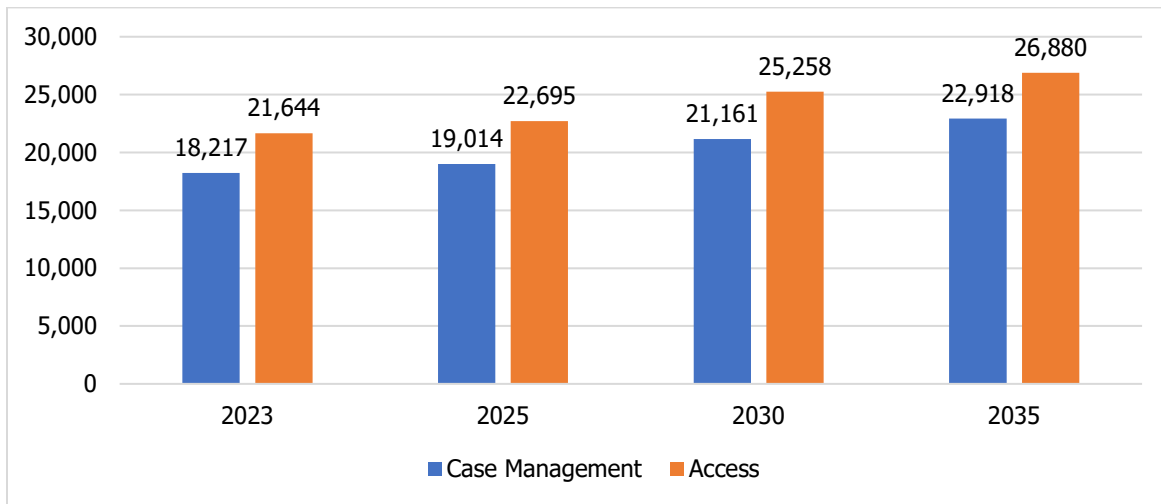
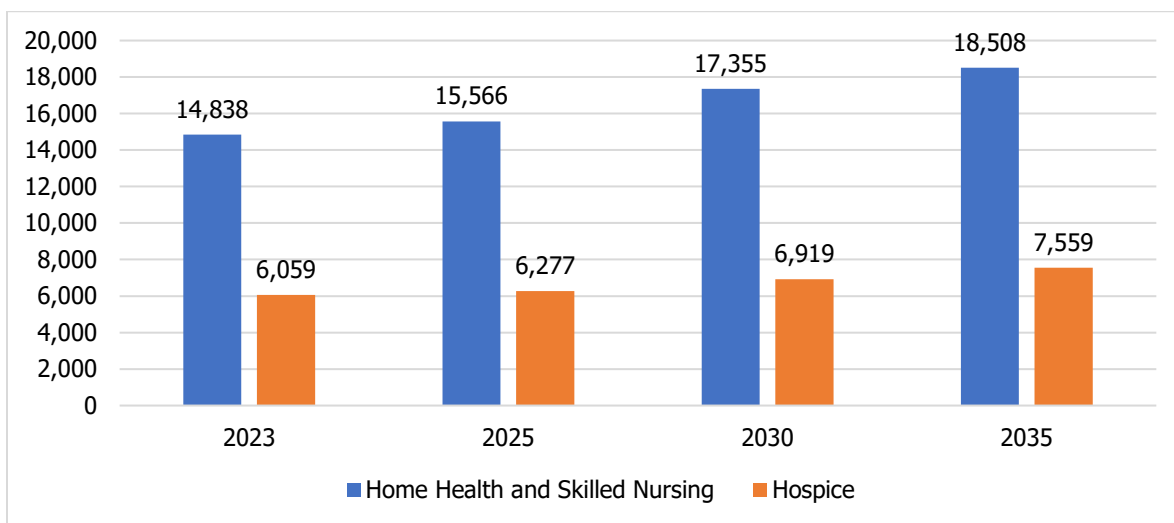


Figure 5.9 Projected Annual Users of Home Health and Skilled Nursing or Hospice by Year



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)

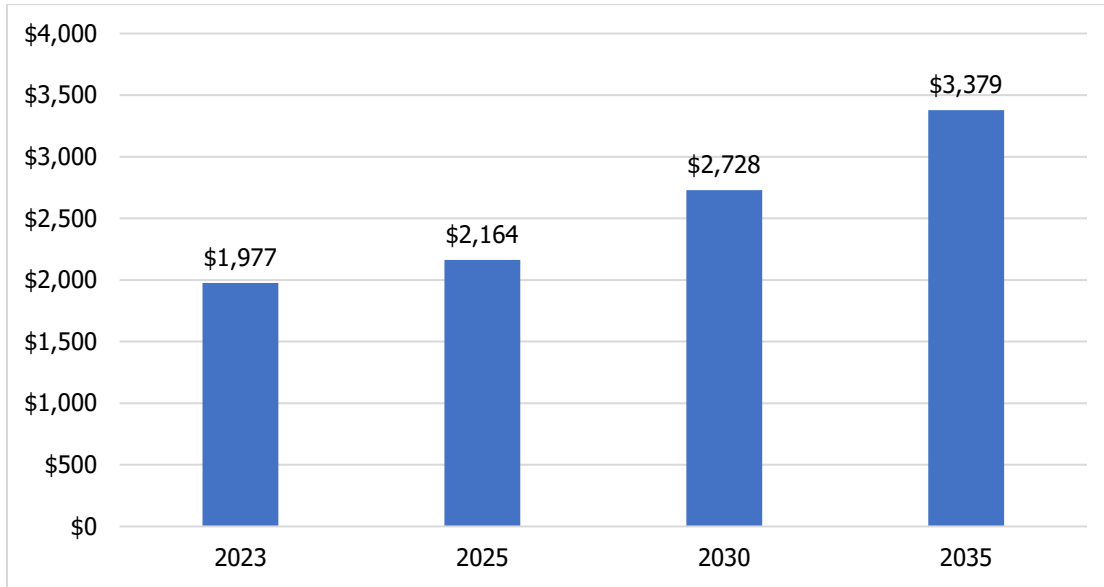


Figure 5.11 Projected Medicaid and Payments for Nursing Facilities and Assisted Living Facilities (\$ Millions, 2.5% annual inflation)

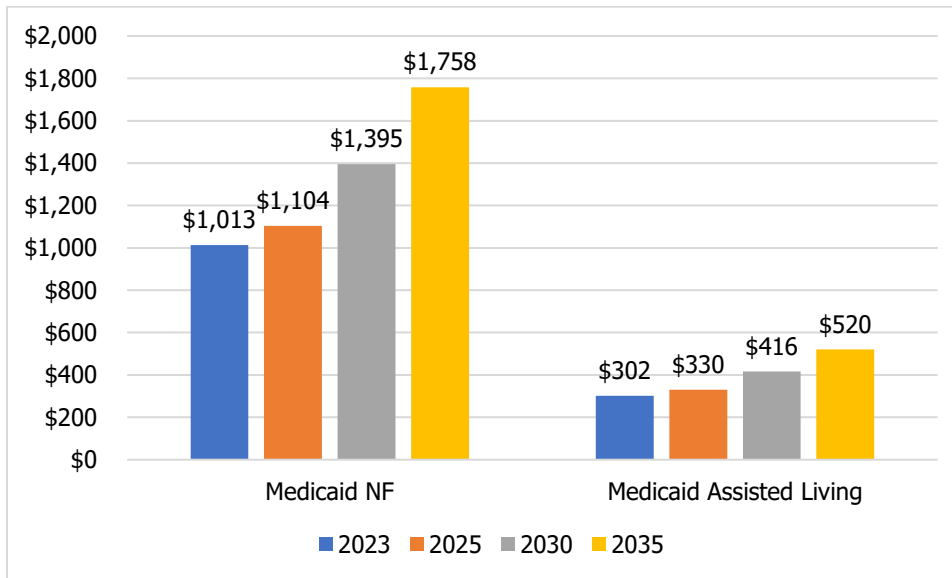
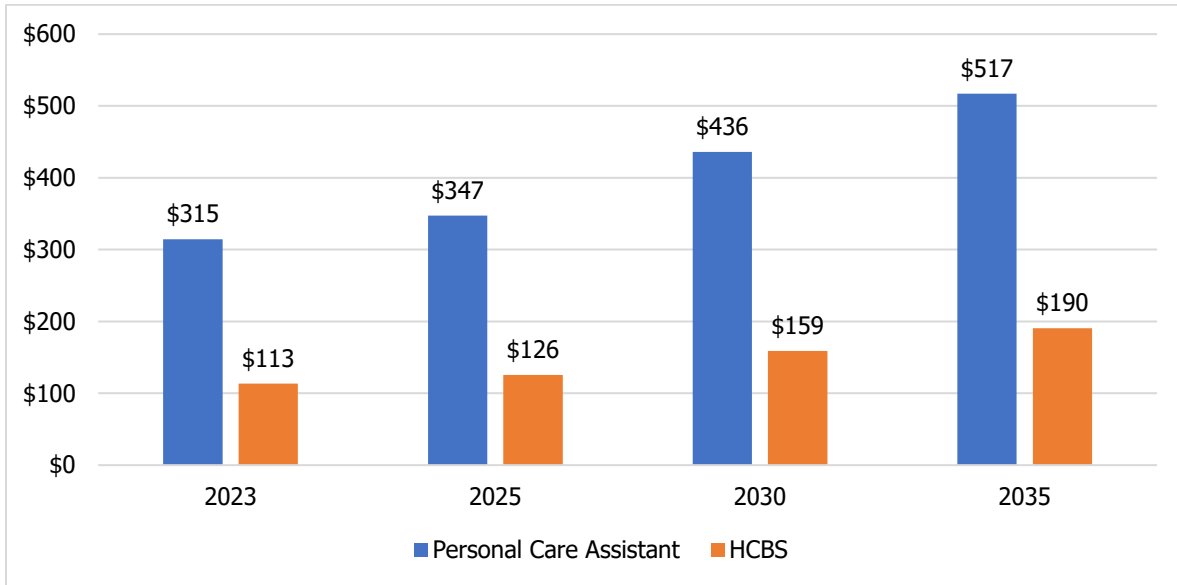


Figure 5.12 Projected Medicaid Payments for Personal Care Assistant and other HCBS (\$ Millions, 2.5% annual inflation)



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)

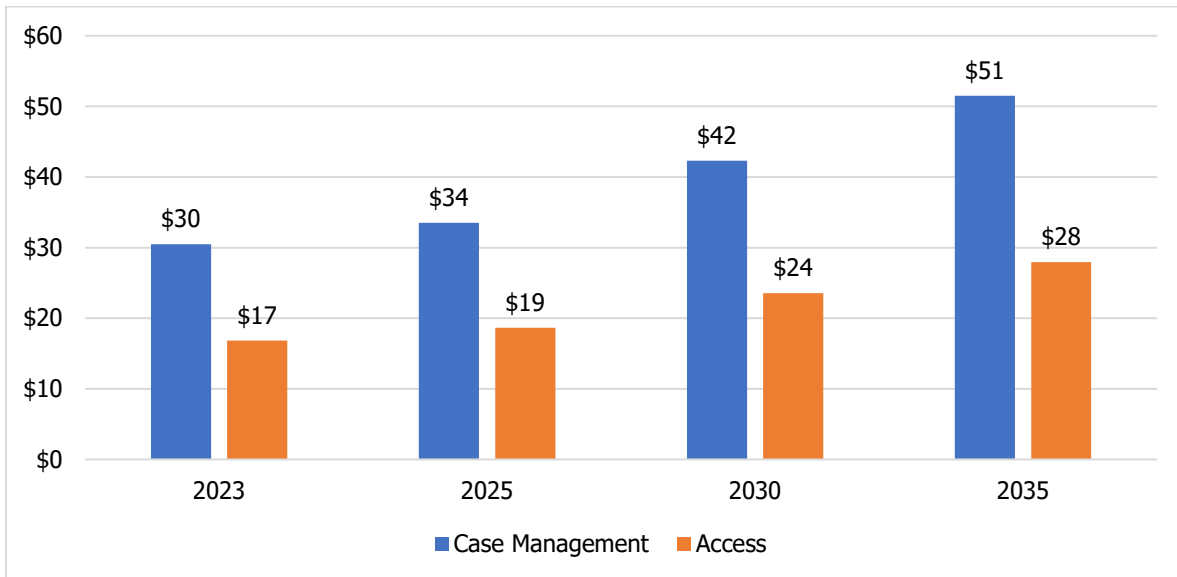


Figure 5.14 Projected Medicaid Payments for Home Health or Hospice (\$ Millions, 2.5% annual inflation)

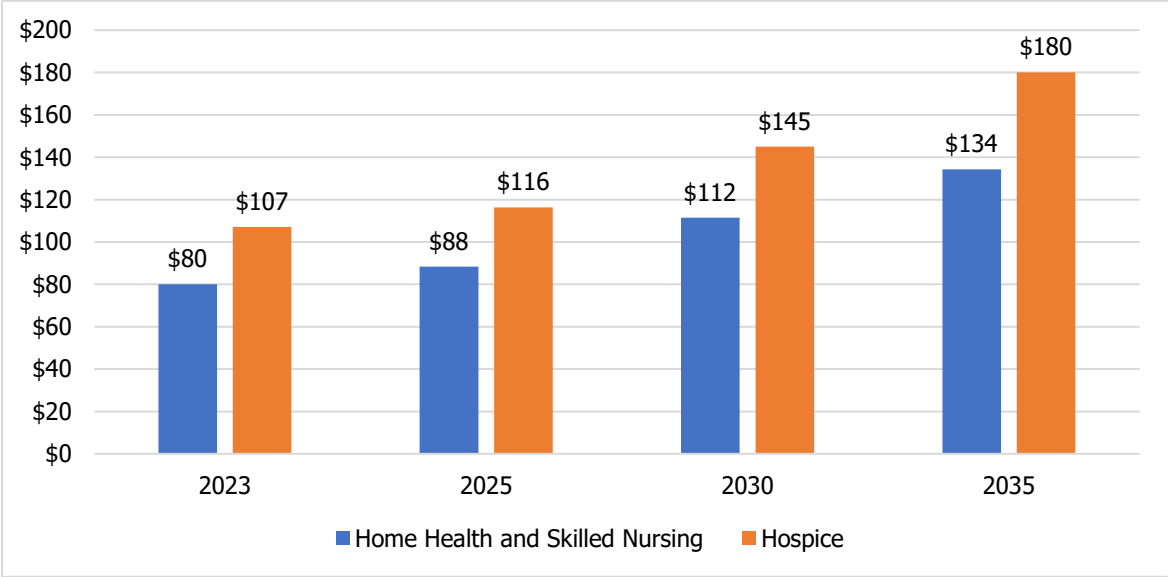


Table 5.1 Percentage Increases from 2023 to Each Future in Use and Payment for LTSS

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

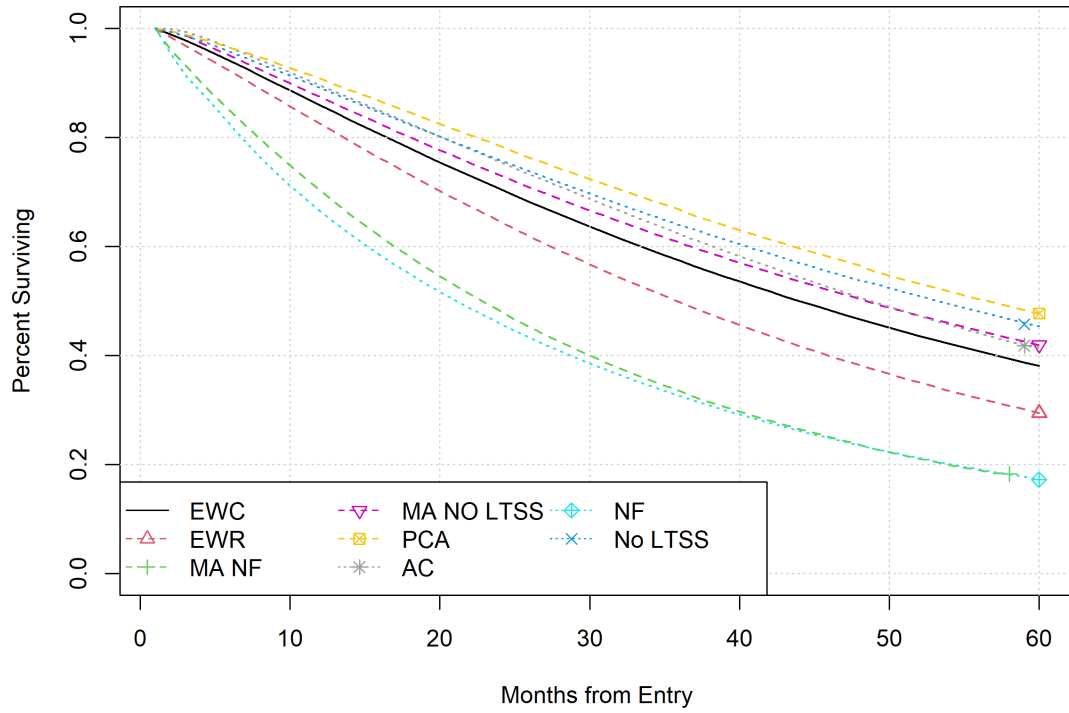
Table 6.3 displays the characteristics of the individual profiles used in the simulation across cohorts. These characteristics were not assumed to change across simulation scenarios and only the age distribution was assumed to change between the simulated cohorts (i.e., over time). The average age is 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%

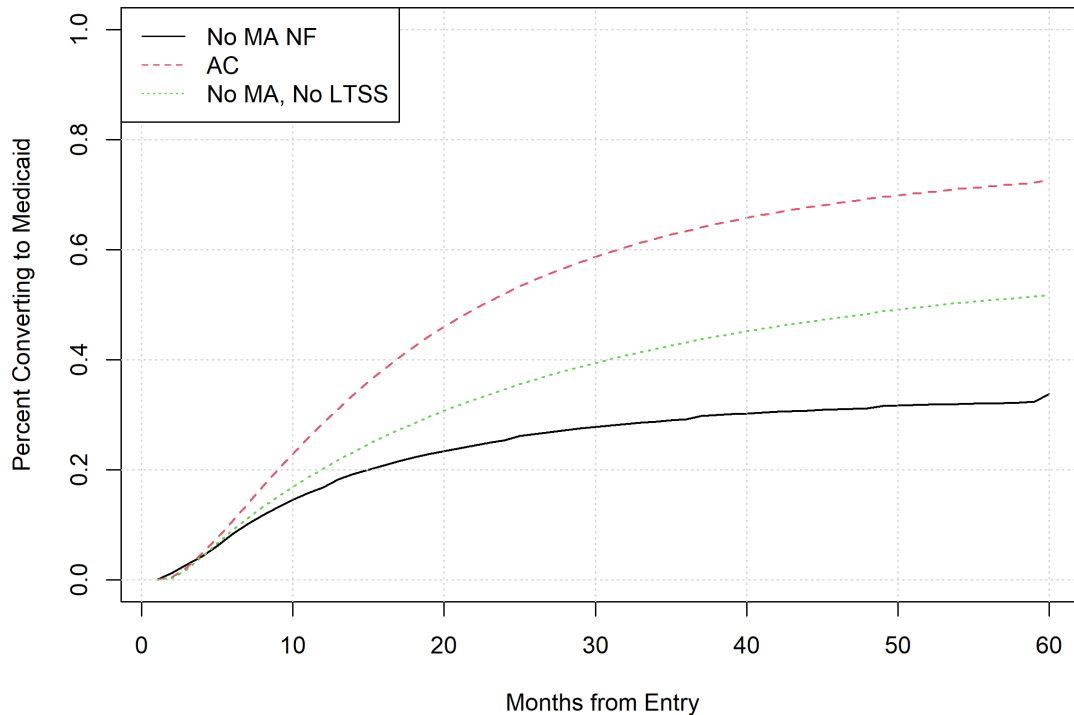
Figure 6.2 displays the simulated survival rate by entry LTSS subgroup over a 5-year time horizon across all three scenarios. Individuals who enter the simulation cohort as part of the annual refresh, in years 2-4 of the 5-year simulation period, do not appear in the later months of the figure (i.e., 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

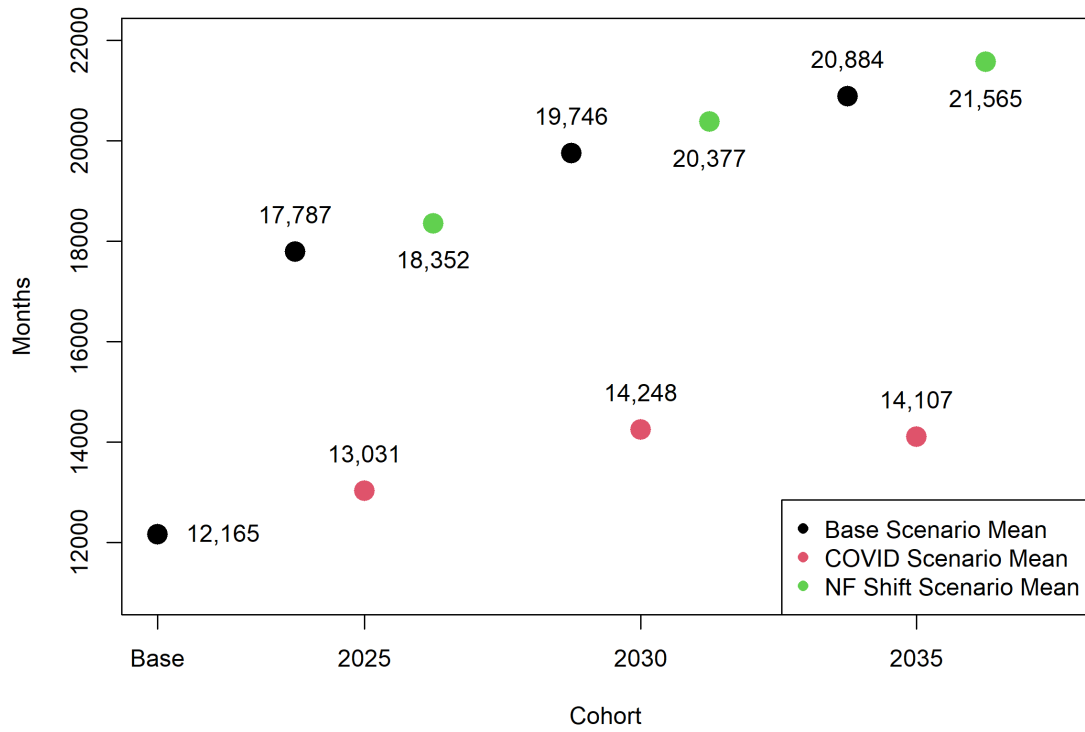


Figure 6.4 EW Residential Mean Months by Simulation Cohort and Scenario

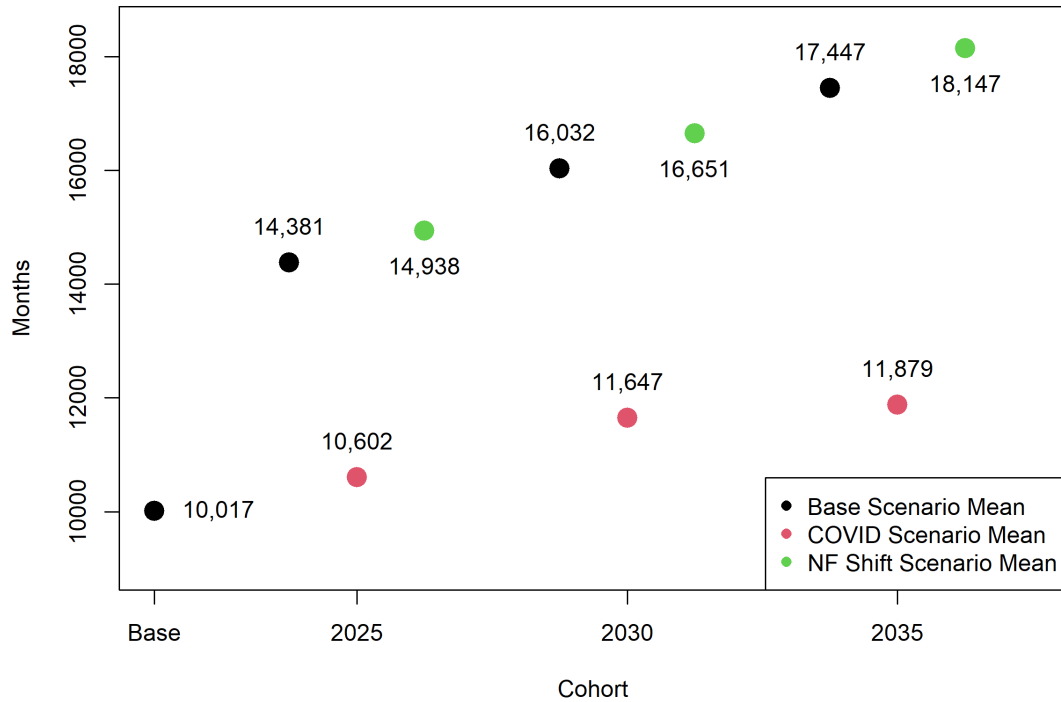


Figure 6.5 Medicaid NF Mean Months by Simulation Cohort and Scenario

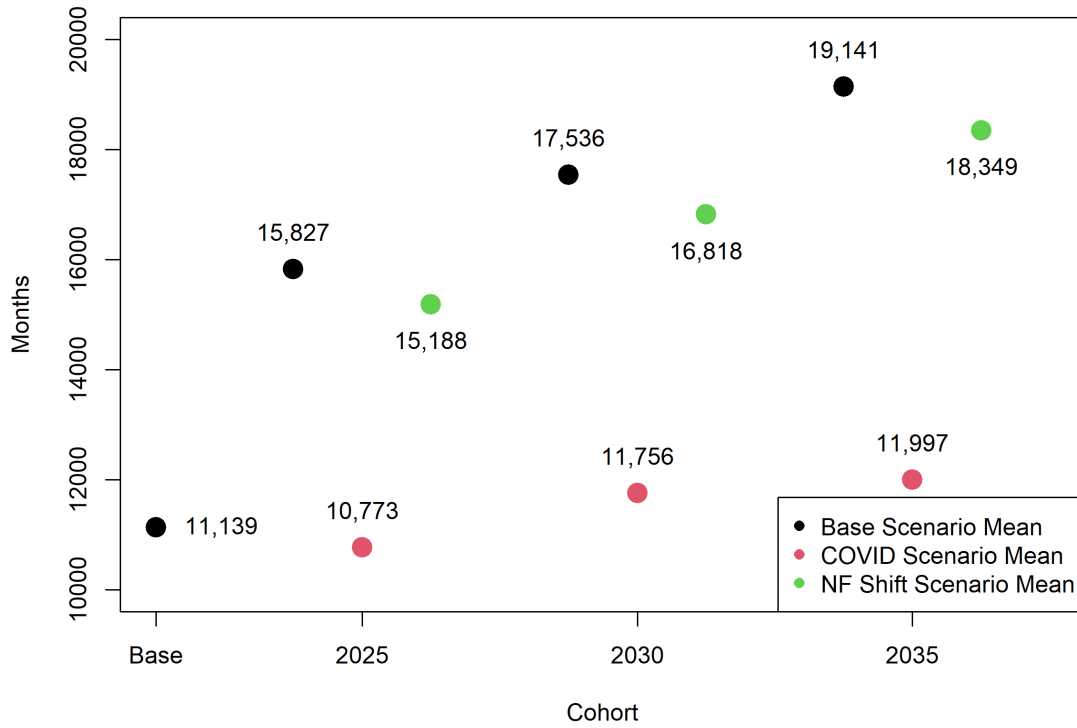


Figure 6.6 Non-Waiver PCA Mean Months by Simulation Cohort and Scenario

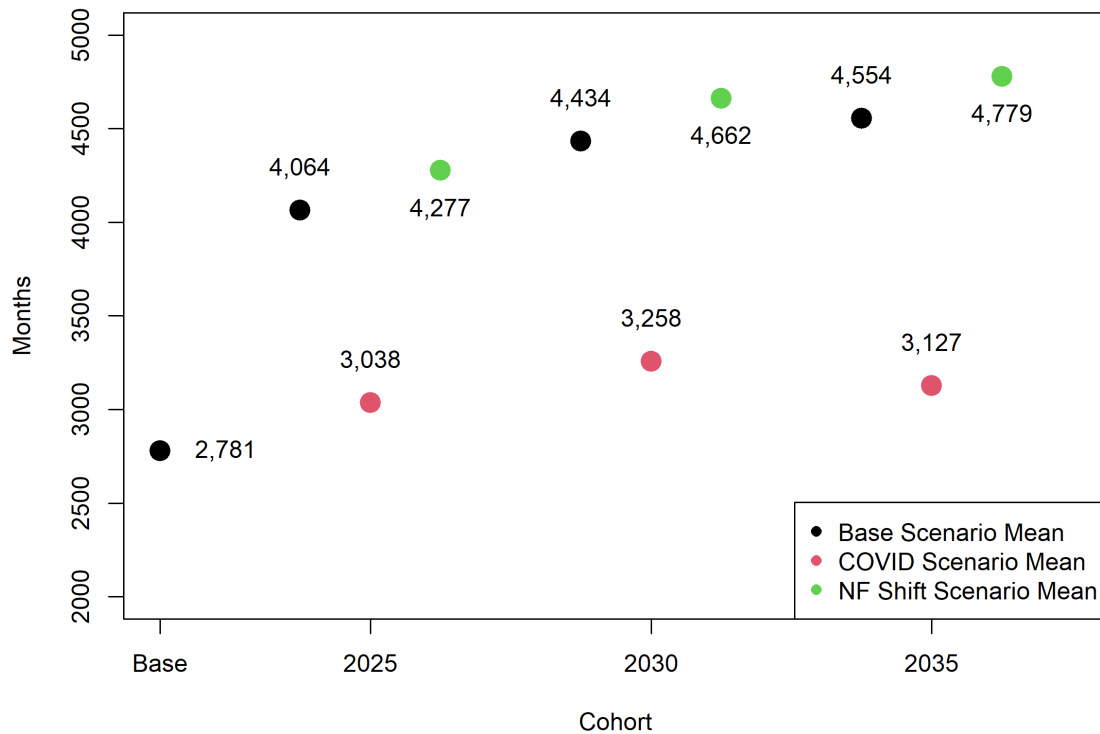


Figure 6.7 Alternative Care Mean Months by Simulation Cohort and Scenario

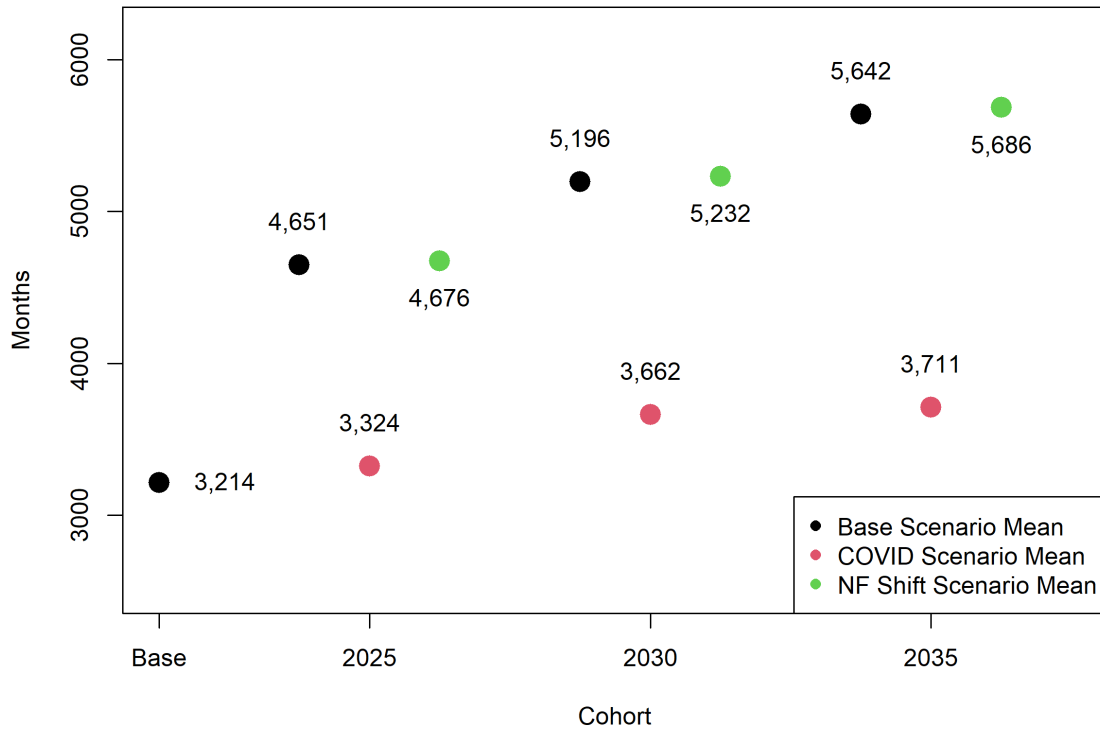
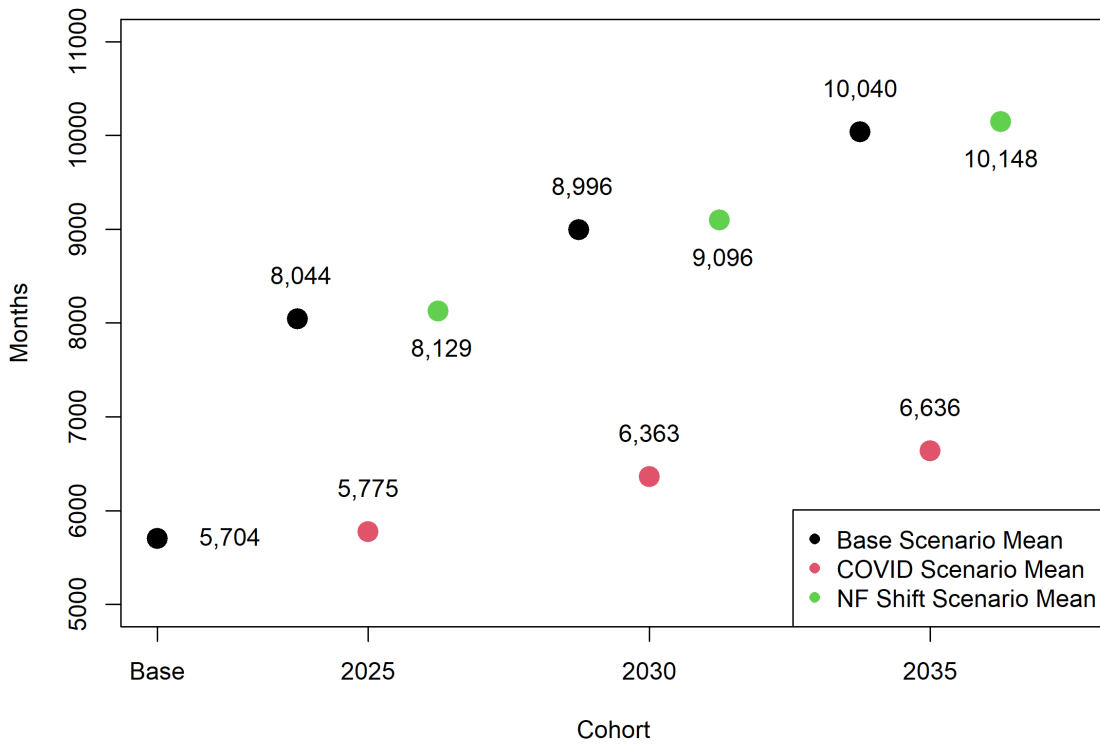


Figure 6.8 Non-Medicaid NF Mean Months by Simulation Cohort and Scenario



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

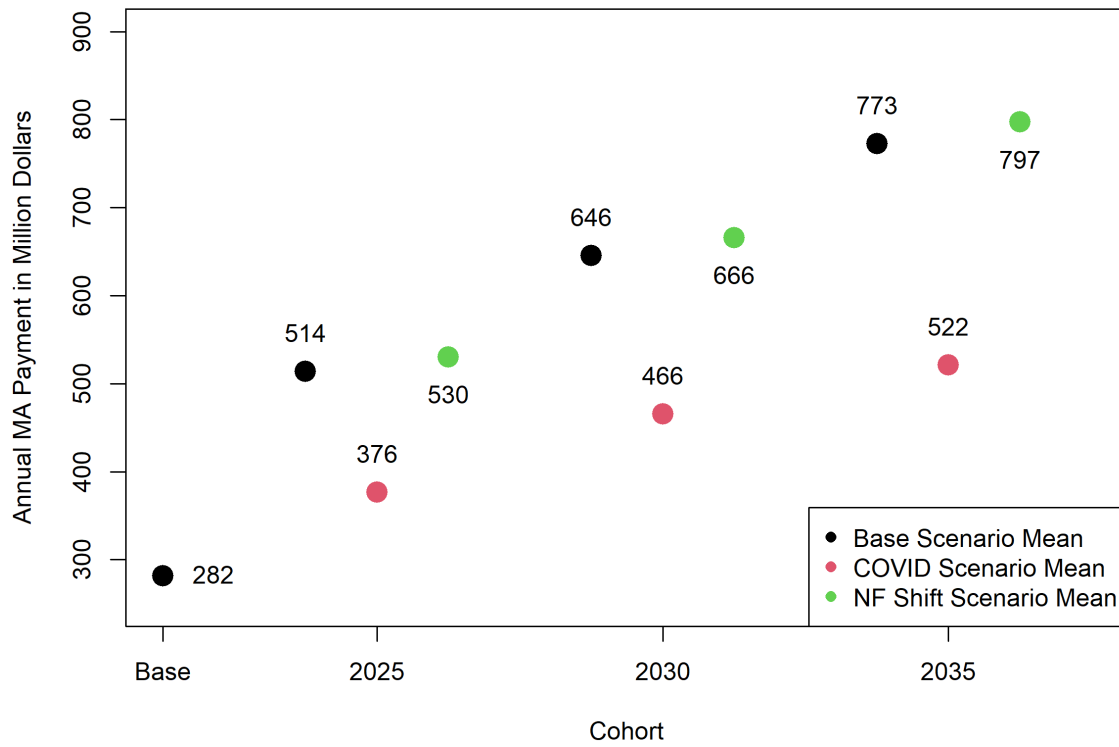


Figure 6.10 EW Residential Mean Annual Dollars by Simulation Cohort and Scenario

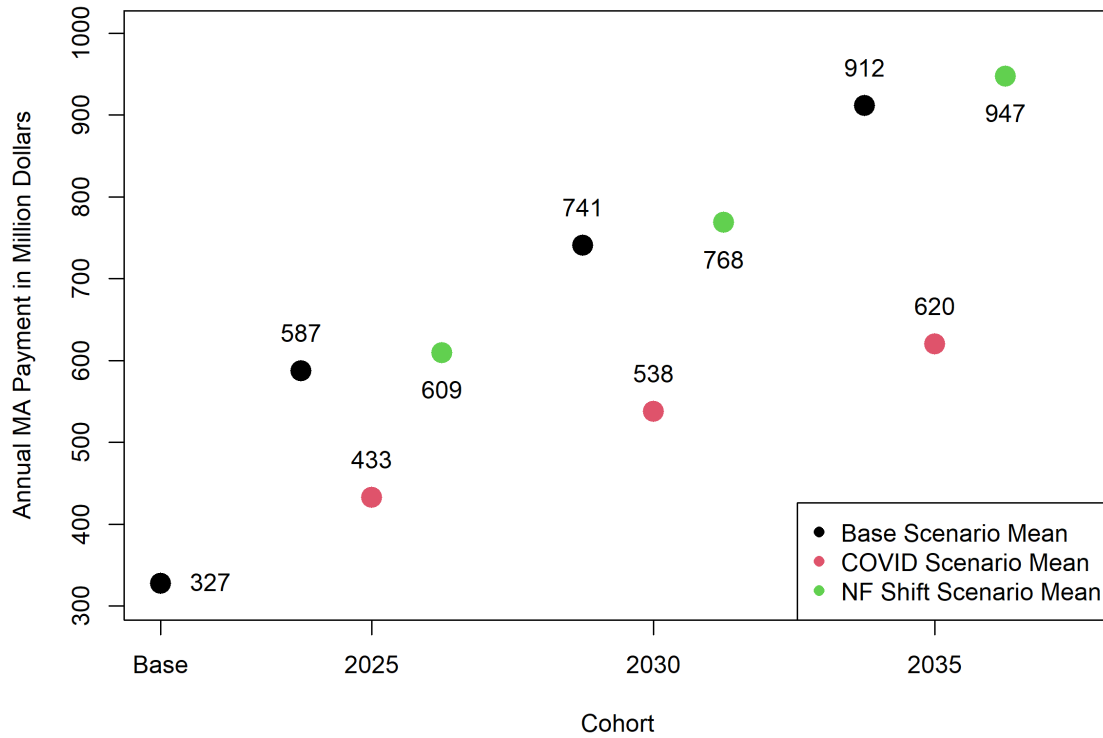


Figure 6.11 Medicaid NF Mean Annual Dollars by Simulation Cohort and Scenario

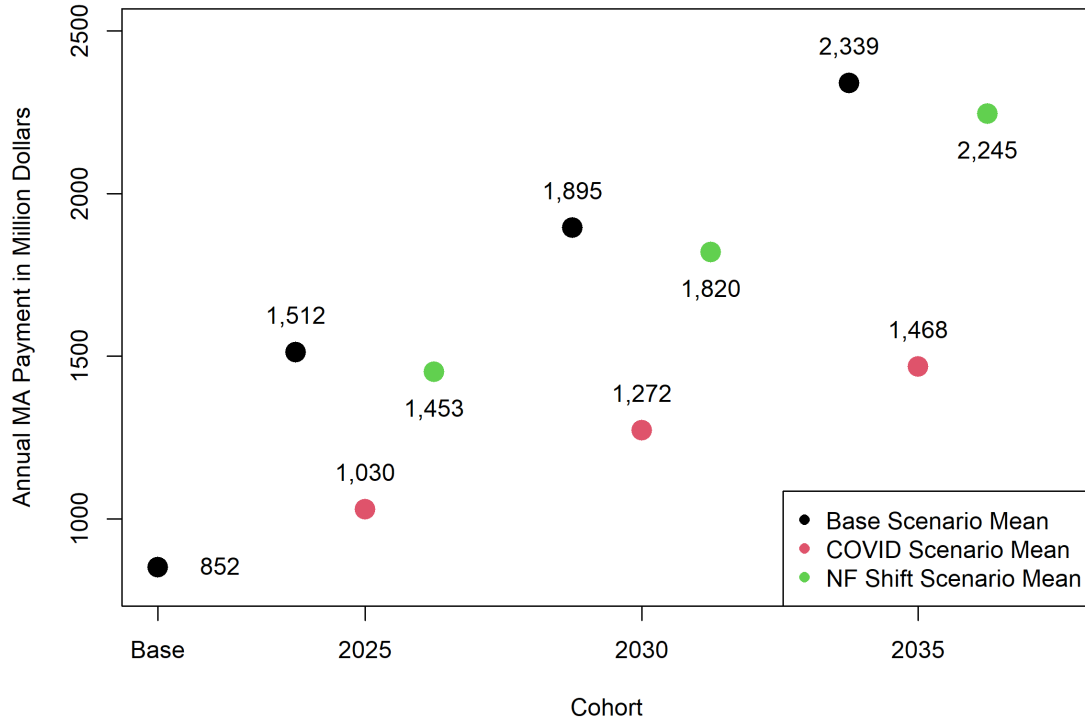


Figure 6.12 Non-Waiver PCA Mean Annual Dollars by Simulation Cohort and Scenario

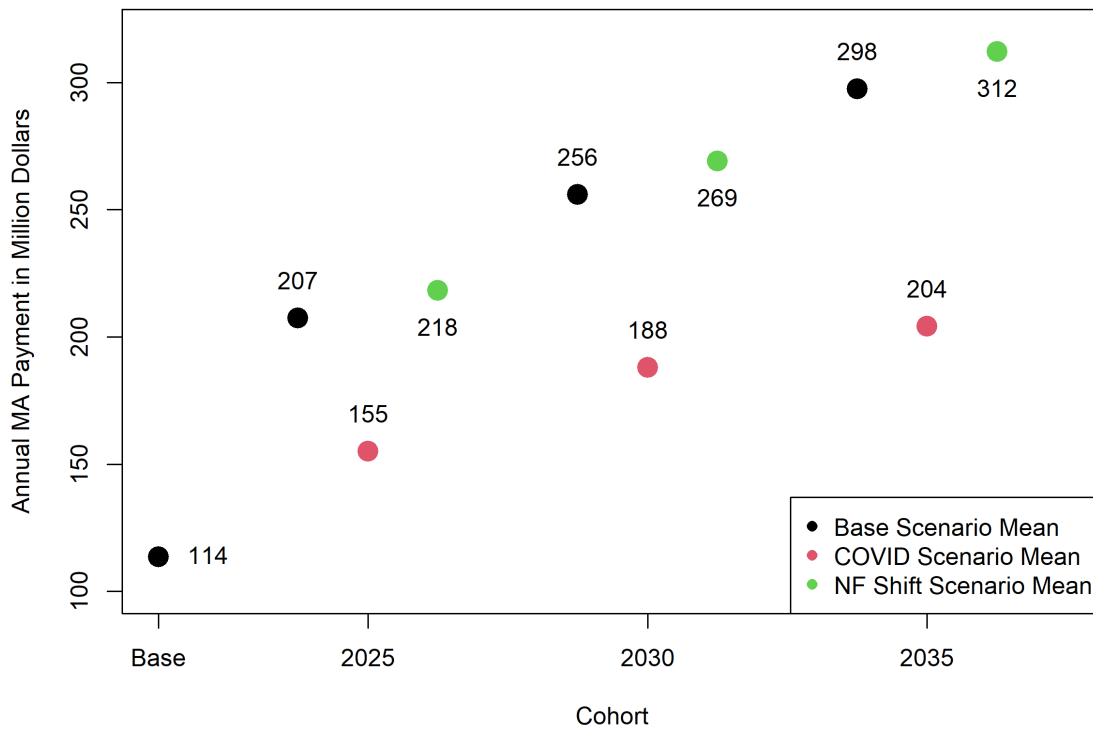


Figure 6.13 Alternative Care Mean Annual Dollars by Simulation Cohort and Scenario

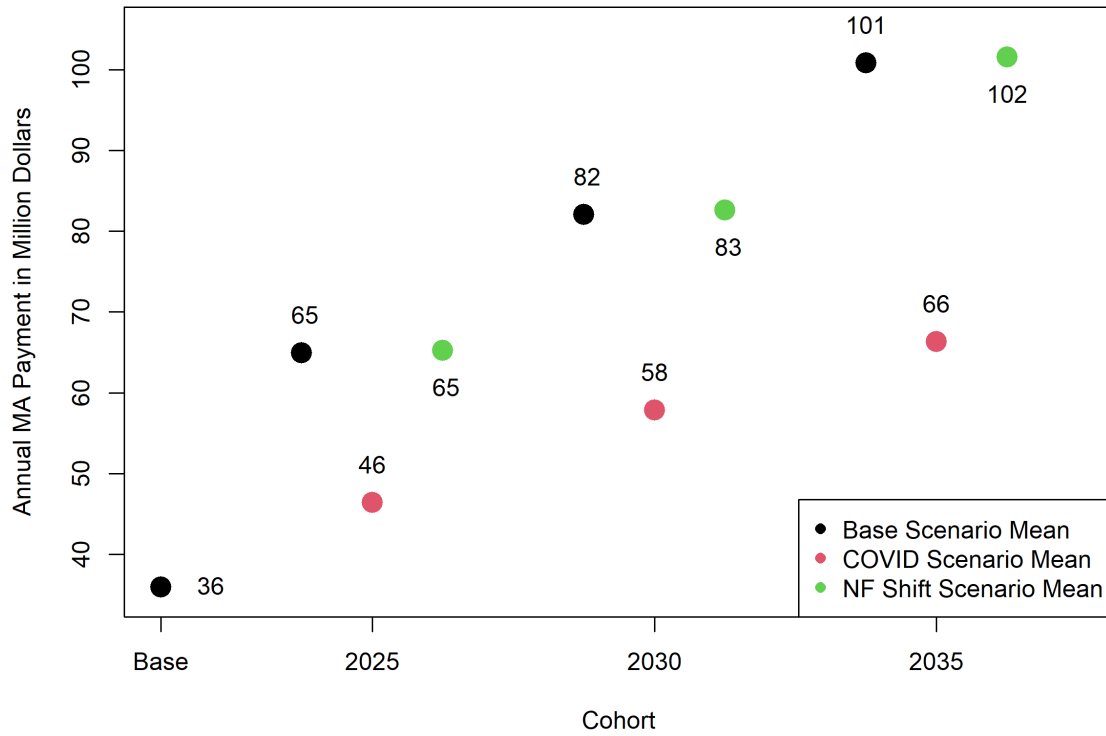
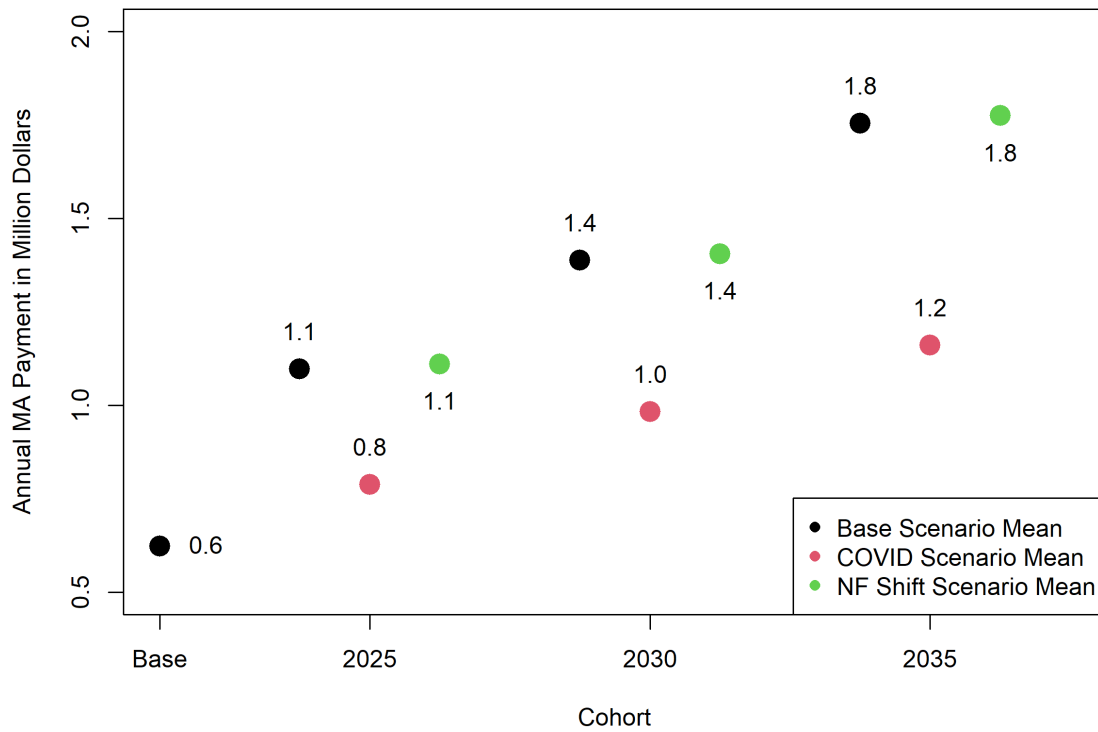


Figure 6.14 Non-MA NF Mean Annual Dollars by Simulation Cohort and Scenario



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.

Appendix – Chapter 2-4

Report: Long-Term Services and Supports for Minnesota’s Older Population: Current and Future Utilization and Payments

November 2023

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Appendix – Chapter 2 Methods

Table 2A.1 Definition of the LTSS Population

Our working definition for the LTSS population is intended to capture persons most in need of LTSS and who are using one or more of these services, and for whom we had available data from the Medicaid Management Information System (MMIS) and nursing facility Minimum Data Set (MDS) resident assessments, the primary sources of data about the LTSS population.

The LTSS Population is defined operationally as meeting all three conditions:

- Age 65 or older.
- Meet NF-LOC criteria based on:
 - Long-Term Care Consultation assessment (HCBS)
 - MDS assessment items (Nursing Facility); and
- Using nursing facilities or Medicaid LTSS currently or with a history of LTSS use.

The settings and services used by the LTSS population fall into broad categories:

- Nursing facilities
 - Enrolled in Medicaid
 - Not Medicaid enrolled – private paying, insurance, or other pay source.
- Medicaid Elderly Waiver- Residential, primarily Customized Living in assisted living facilities
- Medicaid-funded home and community-based care
 - Medicaid Elderly Waiver- Community, all non-residential HCBS
 - Alternative Care Waiver
 - Personal Care Assistance without a waiver program
 - Other home and community-based care without a waiver program.

Members of the LTSS Population must also show evidence of documented needs for LTSS through meeting the Medicaid NF-LOC criteria, based on a nursing home Minimum Data Set assessment or a Long-Term Care Consultation screening form.

The LTSS populations does not include people age 65 and older who were:

- Short-term, post-acute nursing facility residents where NF-LOC cannot be established.
- Nursing facility residents who did not meet NF-LOC criteria based on their MDS assessment.
- Medicaid enrollees with no evidence of meeting NF-LOC and no history of LTSS services in the prior 2 years; or
- Medicaid enrollees age 65 and older participating in an Intellectual Disabilities (ID), Community Alternative Care (CAC), Traumatic Brain Injury (TBI) or Community Access for Disability Inclusion (CADI) waiver.

People age 65 and older participating in a disability waiver have significantly different characteristics and service use patterns than EW or AC waiver participants or other members of the LTSS population. People with a disability waiver may be the subject of a separate analysis if time and resources permit.

Table 2A.2 COS codes associated for LTSS services

Service	COS Code
Access	100
Case Management	044
Customized Living	108
HCBS	
Adult Day Care	102
CDCS	021
Chore	093
Companion	094
Home Meals	095
Homemaker	096
Home Health and Skilled Nursing	020, 089, 114, 122
PCA	038, 119
Nursing Facility	011, 017

Table 2A.3 Coding for Harmonized Variables – Major Diagnoses, Dementia/Cognitive Impairment, Behavioral Health Conditions, and ADL Dependencies.

Variable	Label	Values	Data Source
DX_Dementia	Dementia		Claims and MDS
ADLbed_Origin_Itcc	Bed Mobility	0 Bed Mobility Without Help 1 Sits With Occasional Help 2 Sits Always With Help 3 Turns Always Needs Help	LTCC original
ADLtransfer_Origin_Itcc	Transferring	0 Transfers Without Help 1 Transfers With Guidance 2 Transfers With Help Of One 3 Transfers With Help Of Two 4 Remains Bedfast	LTCC original
ADLdress_Origin_Itcc	Dressing	0 Dresses Without Help 1 Dresses With Supervision 2 Dresses With Others Help 3 Dressed By Others 4 Never Dresses	LTCC original
ADLeat_Origin_Itcc	Eating	0 Eats Without Any Help 1 Eats Minimal Supervision 2 Eats With Assistance 3 Eats With Partial Feeding 4 Eats With Total Feeding	LTCC original
ADLgroom_Origin_Itcc	Grooming	0 Grooms Without Help 1 Grooms With Supervision 2 Grooms With Others Help 3 Groomed By Others	LTCC original
ADLwalk_Origin_Itcc	Walking	0 Walks Without Help 1 Walks With Help Of Device 2 Walks With Help Of One Person 3 Walks With Help Of Two People 4 Unable To Walk	LTCC original

Variable	Label	Values	Data Source
ADLbath_Origin_ltcc	Bathing	0 Bathes Without Any Help 1 Bathes- Minimal Supervision 2 Bathes - Supervised Only 3 Needs/Receives Help In/Out Tub 4 Needs/Receives Help Washing 5 Bathes by Others (Can't Help)	LTCC original
ADLtoilet_Origin_ltcc	Toileting	0 Toileting Independent 1 Toileting Needs Help 2 Toileting Occas Incontinent 3 Toileting Night Incontinent 4 Toileting Bladder Incontinent 5 Toileting Bowel Incontinent 6 Toileting Both Incontinent	LTCC original
ADLbed_harmonized_ltcc	Bed Mobility	0 Independent, Supervision, or Limited assistance 1 Extensive assistance 2 Total dependence	LTCC harmonized
ADLtransfer_harmonized_ltcc	Transferring		LTCC harmonized
ADLdress_harmonized_ltcc	Dressing		LTCC harmonized
ADLeat_harmonized_ltcc	Eating		LTCC harmonized
ADLgroom_harmonized_ltcc	Grooming		LTCC harmonized
ADLwalk_harmonized_ltcc	Walking		LTCC harmonized
ADLbath_harmonized_ltcc	Bathing		LTCC harmonized
ADLtoilet_harmonized_ltcc	Toileting		LTCC harmonized
ADLsum_harmonized_ltcc	The total score of 8 harmonized ADLs		LTCC harmonized
ADLbed_Origin_mds	Bed Mobility	0 Independent 1 Supervision 2 Limited assistance 3 Extensive assistance 4 Total dependence	MDS original
ADLtransfer_Origin_mds	Transferring		MDS original
ADLdress_Origin_mds	Dressing		MDS original
ADLeat_Origin_mds	Eating		MDS original
ADLgroom_Origin_mds	Grooming		MDS original
ADLwalk_Origin_mds	Walking		MDS original
ADLbath_Origin_mds	Bathing		MDS original
ADLtoilet_Origin_mds	Toileting		MDS original

Variable	Label	Values	Data Source
ADLsum_Origin_mds	The total score of 8 original ADLs		MDS original
ADLbed_harmonized_mds	Bed Mobility	0 Independent, Supervision, or Limited assistance 1 Extensive assistance 2 Total dependence	MDS harmonized
ADLtransfer_harmonized_mds	Transferring		MDS harmonized
ADLdress_harmonized_mds	Dressing		MDS harmonized
ADLeat_harmonized_mds	Eating		MDS harmonized
ADLgroom_harmonized_mds	Grooming		MDS harmonized
ADLwalk_harmonized_mds	Walking		MDS harmonized
ADLbath_harmonized_mds	Bathing		MDS harmonized
ADLtoilet_harmonized_mds	Toileting		MDS harmonized
ADLsum_harmonized_mds	The total score of 8 harmonized ADLs		MDS harmonized
ADLbed_harmonized_combined		For the _combined variables, both the LTCC and MDS information was incorporated. For persons with values in both LTCC and MDS, the value = average value in both data files. As a result, there are some values which are not whole numbers.	LTCC and MDS
ADLtransfer_harmonized_combined			
ADLdress_harmonized_combined			
ADLeat_harmonized_combined			
ADLgroom_harmonized_combined			
ADLwalk_harmonized_combined			
ADLbath_harmonized_combined			
ADLtoilet_harmonized_combined			
ADLsum_harmonized_combined			
BehaviorSympYN_ltcc	The person has a frequent history of behavior symptoms.	0 No 1 Yes	LTCC
BehaviorSympYN_mds	Overall presence of behavioral symptoms	0 No 1 Yes	MDS
BehaviorSympYN_combined	Value =0.5 is the mean value of values in LTCC and MDS <ul style="list-style-type: none"> BehaviorSympYN_ltcc ==0 & BehaviorSympYN_mds ==1 Or BehaviorSympYN_ltcc ==1 & BehaviorSympYN_mds ==0 		LTCC and MDS

Variable	Label	Values	Data Source
CogImpairedYN_ltcc	The person has impaired cognition.	0 No 1 Yes	LTCC
CogImpairedYN_mds	CFS4gp_mds was used to create this binary variable.	0 Cognitively Intact/Mildly Impaired 1 Moderately Impaired/Severely Impaired	MDS
CogImpairedYN_combined	Value =0.5 is the mean value of values in LTCC and MDS		LTCC and MDS
CFS4gp_mds (Cognitive Performance Scale)	Severity of cognitive impairment (cognitive function scale)	0 Cognitively Intact 1 Mildly Impaired 2 Moderately Impaired 3 Severely Impaired	MDS
DementiaYN_All_ltcc	Either DX_Dementia =1 or CogImpairedYN_ltcc ==1		LTCC
DementiaYN_All_mds	Either DX_Dementia =1 or CogImpairedYN_mds ==1		MDS
DementiaYN_All_combined	Value =0.5 is the mean value of values in LTCC and MDS		LTCC and MDS

Appendix – Chapter 3 Characteristics of LTSS Population at Baseline

Table A3.1 Characteristics of Average Monthly LTSS Population at Baseline (Annually 2016-2019) by detailed LTSS Categories

	Medicaid Nursing Facility	Medicaid Assisted Living	Medicaid HCBS - Elderly Waiver	Medicaid HCBS - PCA w/o waiver	Medicaid HCBS - Alternative Care	Non-Medicaid Nursing Facility	Total
Average Number of Users/Month	12174	8707	15305	2495	2356	6280	47317
Row Percentage	26%	18%	32%	5%	5%	13%	100%
Age Category							
65-74	21%	20%	46%	58%	32%	11%	30%
75-84	30%	34%	38%	29%	36%	27%	33%
85+	49%	45%	16%	13%	32%	62%	37%
Total	100%	100%	100%	100%	100%	100%	100%
Gender							
Female	30%	25%	30%	34%	27%	38%	30%
Male	70%	75%	70%	66%	73%	62%	70%
Total	100%	100%	100%	100%	100%	100%	100%
Marital status							
Married	11%	8%	17%	22%	14%	34%	16%
Widowed	47%	49%	31%	32%	44%	51%	42%
Divorced or separated	28%	29%	39%	33%	29%	6%	29%
Never married	14%	14%	14%	13%	13%	9%	13%
Total	100%	100%	100%	100%	100%	100%	100%
Race/Ethnicity							
Asian							
Pacific/Islanders	1%	2%	20%	50%	1%	0%	10%
Black/African American							
American Indian	3%	2%	23%	28%	6%	1%	11%
Hispanic	1%	1%	3%	2%	1%	0%	1%
Native American	1%	1%	2%	5%	1%	0%	1%
White/non-Hispanic	94%	94%	52%	16%	91%	99%	77%
Total	100%	100%	100%	100%	100%	100%	100%

	Medicaid Nursing Facility	Medicaid Assisted Living	Medicaid HCBS - Elderly Waiver	Medicaid HCBS - PCA w/o waiver	Medicaid HCBS - Alternative Care	Non-Medicaid Nursing Facility	Total
Residential Location							
Twin Cities	53%	55%	73%	83%	68%	49%	62%
Other MSA	6%	10%	5%	5%	5%	9%	6%
Outlying counties of an MSA	6%	6%	3%	1%	5%	6%	5%
Rural	35%	30%	19%	12%	21%	35%	27%
Total	100%	100%	100%	100%	100%	100%	100%
Dementia							
Yes	70%	71%	38%	46%	35%	62%	56%
No	30%	29%	62%	54%	65%	38%	44%
Total	100%	100%	100%	100%	100%	100%	100%
Behavioral Health Conditions							
Yes	32%	62%	31%	30%	51%	25%	37%
No	68%	38%	69%	70%	49%	75%	63%
Total	100%	100%	100%	100%	100%	100%	100%
Number of ADL Dependencies (Range: 0-16)							
Mean	4.77	3.09	2.49	5.09	2.03	5.66	3.72
Standard Deviation	2.71	2.39	2.41	2.23	2.10	2.34	2.76

Appendix – Chapter 4 – Trends in LTSS Pre-COVID (2018-2019) and COVID Period (2020-2021)

Introduction

The Appendix to Chapter 4 further describes trends between 2018 and 2021 in demographics, functional status, mortality, and service use and Medicaid payments for older people in Minnesota who met nursing facility level of care (NF-LOC) criteria and who were using nursing facilities (both Medicaid enrolled and not enrolled) or Medicaid-funded long-term supports and services (LTSS) in the community. Also, by comparing trends in years before the COVID-19 pandemic with the first year of the pandemic, we have an indication of the effect of COVID-19 on the characteristic of the LTSS population and their service use. The trend analysis is based on comparative cross-sections of the LTSS population on March 1, 2018-2020, before the COVID-19 pandemic began, and March 1, 2021, after a full year of the pandemic. The dates for the cross sections are: March 1 for each year, 2018-2020 immediately before the pandemic began, and March 1 2021 after a full year of the pandemic. We also conducted a longitudinal analysis of mortality, transitions between LTSS settings and programs, and use and cost of LTSS services for members of the LTSS population beginning on the March 1 dates.

Data Sources and Major Variables

Minnesota's Medicaid Management Information System (MMIS) and nursing facility Minimum Data Set (MDS) resident assessments are the primary sources of information about the LTSS population. Among the wide range of variables in these data systems, we selected the following program categories, demographic characteristics, and functional measures that are used in defining nursing facility level of care (NF-LOC), mortality and other outcomes. These definitions are as follows:

- LTSS settings and programs
 - Nursing facility (Medicaid and non-Medicaid)
 - Medicaid Elderly Waiver participation: EW – Residential (primarily assisted living facilities); EW – Community (non-residential HCBS); and Alternative Care Waiver (Medicaid-funded HCBS provided to older people not enrolled in Medicaid but who meet special financial eligibility criteria).
 - Medicaid Personal Care Assistant (PCA) or other non-waiver HCBS services outside of a Medicaid waiver.
- Demographics
 - Age (age 65-74, 75-84, 85+)
 - Sex (Male, Female)
 - Race/ethnicity (Asian or Pacific Islander, non-Hispanic Black/African American, Hispanic, Native American, Multiple Races, and white (non-Hispanic))
 - Urban or rural residence (Twin Cities, other metro area, counties adjacent to metro area, and rural)
- Characteristics of nursing facility residents
 - Prior NF use within 2 years before current admission
 - Admission source (home, hospital, or other)
 - Cognitive status (Intact, Mild, Moderate, Severe)
 - ADL dependency (Bed Mobility, Transferring, Eating, and Toileting) (1-4)
 - Daily behavioral problems (y/n)
 - Bladder or bowel incontinence daily (y/n)

- Characteristics of Waiver, PCA, and other HCBS services
 - 4+ ADL needs (any 4 from among dressing, bathing, eating, walking, transferring, bed mobility, or toileting)
 - Critical ADLs (1 or more of eating, transferring, or bed mobility)
 - Clinical Monitoring
 - Cognitive or Behavioral Risk (any of orientation impairment, mental status impairment, behavioral needs, or self-preservation risk)
 - Institutional Risk (combinations of living alone, homeless, or risk of homelessness with history of falls, vision or hearing impairment, or risk of self-neglect or exploitation)
 - Risk of self-neglect (yes/no)
- Longitudinal outcomes
 - Mortality - date of death from Medicaid enrollment files and/or Minnesota vital statistics
 - Transition between nursing home, waiver, PCA, or other LTSS categories
 - Conversion to Medicaid for nursing home residents not enrolled in Medicaid or for AC participants
 - Months of Medicaid LTSS service use and costs
- Medicaid LTSS service use and payments
 - Service category definitions can be found in the [Minnesota DHS Provider Manual](#)

Analysis

March 1 of each year was selected for the comparative cross-sections because a single date offered a snapshot of annual Medicaid enrollment and nursing facility use. March was selected because it is at the very beginning of the COVID-19 pandemic in 2020. Members of Minnesota's LTSS population on March 1, 2020, had not yet been touched by the COVID-19 outbreak in Minnesota, whereas members of the LTSS population in March 2021 had a full 12 months of exposure. The trend analysis relies heavily on visualization through tables and graphs comparing numbers and percentages in each year. Any interruptions in the trend between 2018-2020 and 2021, either upward or downward, is an indication of a COVID-19 effect. We should keep in mind, however, that other factors besides the pandemic could have contributed to the changes between periods.

Findings

Trends in Minnesota's LTSS program participation, demographic characteristics, functional status and other criteria associated NF-LOC criteria, mortality, and other outcomes are described in the following sections of the report. The analysis focuses on the trends in key variables on March 1 in 2018-2020 immediately before the spread of the disease in Minnesota, and March 1, 2021, after a full year of exposure to COVID-19. Findings are reported for nursing facility residents, waiver participants, and users of PCA without a waiver. The characteristics of users of other HCBS without a waiver are not reported because the numbers are too small for reliable estimates.

Use of Service by LTSS Status

The numbers and percentages of nursing home residents, waiver participants, and users of PCA by year are presented in Tables 1-2 and Figures 1-4.

Number of Nursing Facility Residents – As noted for nursing facilities we obtained data for both Medicaid and non-Medicaid NF residents and compared the two. The COVID-19 effect on

health outcomes appeared to be stronger for Medicaid nursing facility residents than for non-Medicaid residents. The overall number of Medicaid residents in NFs showed a downward trend from 2018-2020 and then an accelerated decline during the COVID-19 pandemic between March 2020 and 2021 (Table 1, Figure 1). The decline was greatest for residents with a length of stay greater than 90 days.

The number of non-Medicaid NF residents showed a slower downward trend from 2018-2020 (Table 1, Figure 2) than the Medicaid residents. Between 2020 and 2021 the total number of non-Medicaid residents did not show a similar sharp decline; the decline was in line with the prior year's downward trend. However, non-Medicaid residents with longer stays experienced a decline while the number of residents with shorter stays experienced an increase. Nursing Facilities apparently were admitting more post-acute care residents in response to the COVID-19 pandemic, while overall length of stay shortened.

Number of Medicaid Elderly Waiver, AC, and PCA Participants - After experiencing a steady upward trend from 2018-2020, the number of EW – Residential participants (assisted living facility residents) experienced a decline during the pandemic (Table 1 and Figure 3). However, this decline was less pronounced than among the Medicaid long-stay nursing home residents. After experiencing an increase from 2018-2020, the number of EW – Community participants held steady in 2021 (Table 1, Figure 3). The number of AC participants also held relatively steady during the pandemic, while the number of users of PCA services (without a waiver) declined (Table 1, Figure 4).

Percentage distribution across modalities of care - The use of LTSS by type of care as a percentage of the total LTSS population are presented in Table 2. The percentage of nursing facility residents enrolled in Medicaid dropped during the pandemic, from 23% in March 2020 to 19% in March 2021, while non-Medicaid residents increased slightly from 11% to 12%. Over the same period, the percentage of EW -- Residential participants remained steady at 20%, the EW – Community participants increased from 35% to 38%, Alternative Care participants remained stable at 5%, and users of PCA without a waiver dropped slightly from 5% to 4%.

Table 1. Number of Minnesota LTSS Population by LTSS status

	2018	2019	2020	2021
LTSS Category				
MA NF 0-90 Days	1236	1250	1297	811
MA NF 91+ Days	10787	10574	10158	7901
Non-MA NF 0-90 Days	1415	1342	1368	1545
Non-MA NF 91+ Days	4689	4582	4376	4009
EW – Residential	9390	9618	10046	9390
EW – Community	16317	16996	17565	17589
AC	2508	2442	2595	2510
PCA w/o Waiver	2512	2551	2422	1984
Other HCBS w/o Waiver	1251	860	674	502
Total	50105	50215	50501	46241
Grouped by Major Category				
Medicaid NF Residents	12023	11824	11455	8712
Non-Medicaid NF Residents	6104	5924	5744	5554
EW Residential	9390	9618	10046	9390
EW Community, AC, PCA, Other HCBS	22588	22849	23256	22585

Table 2. Percentage of LTSS Population by LTSS status

	2018	2019	2020	2021
Number	50105	50215	50501	46241
LTSS Category				
MA NF 0-90 Days	2%	2%	3%	2%
MA NF 91+ Days	22%	21%	20%	17%
Non-MA NF 0-90 Days	3%	3%	3%	3%
Non-MA NF 91+ Days	9%	9%	9%	9%
EW – Residential	19%	19%	20%	20%
EW – Community	33%	34%	35%	38%
AC	5%	5%	5%	5%
PCA w/o Waiver	5%	5%	5%	4%
Other HCBS w/o Waiver	2%	2%	1%	1%
Grouped by Major Category				
Medicaid NF Residents	24%	24%	23%	19%
Non-Medicaid NF Residents	12%	12%	11%	12%
EW Residential	19%	19%	20%	20%
EW Community, AC, PCA, Other	45%	46%	46%	49%

Figure 1. Number of Medicaid Nursing Facility Residents by Length of Stay on March 1, 2018-2021

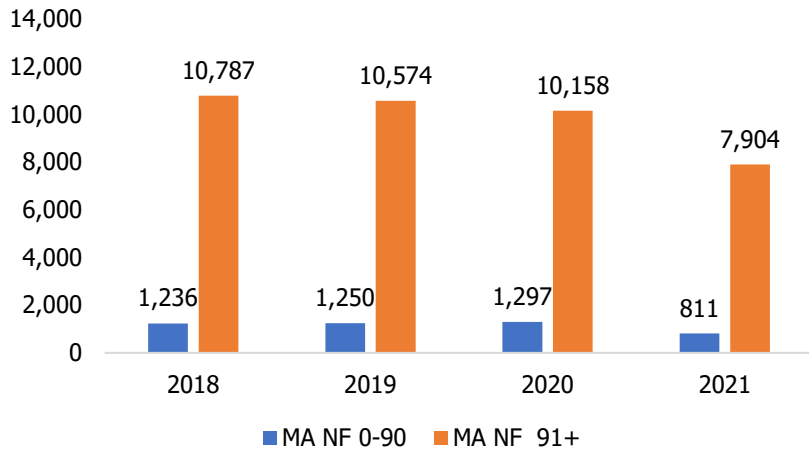


Figure 2. Number of Non-Medicaid Nursing Facility Residents by Length of Stay on March 1, 2018-2021

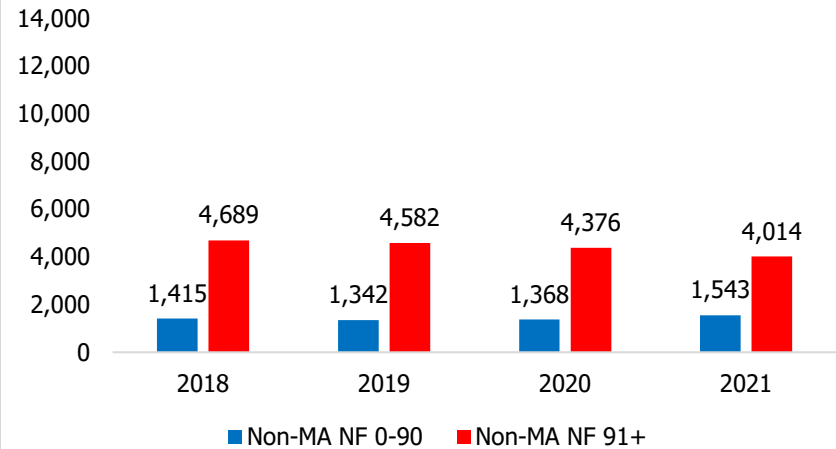


Figure 3. Number of Elderly Waiver Participants on March 1, 2018-2021

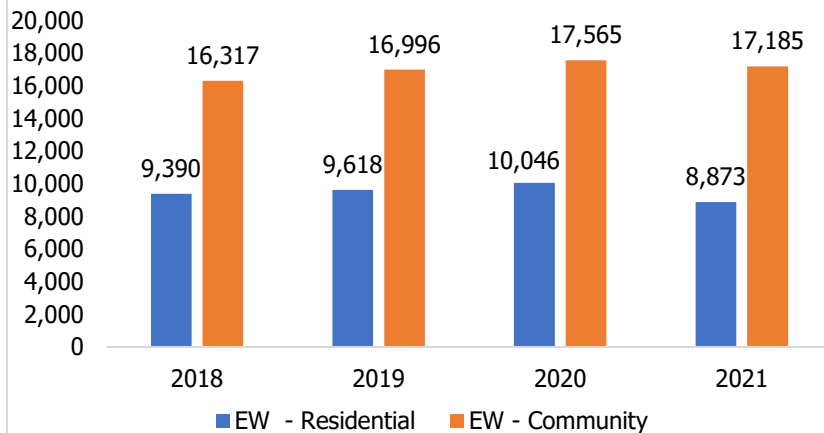
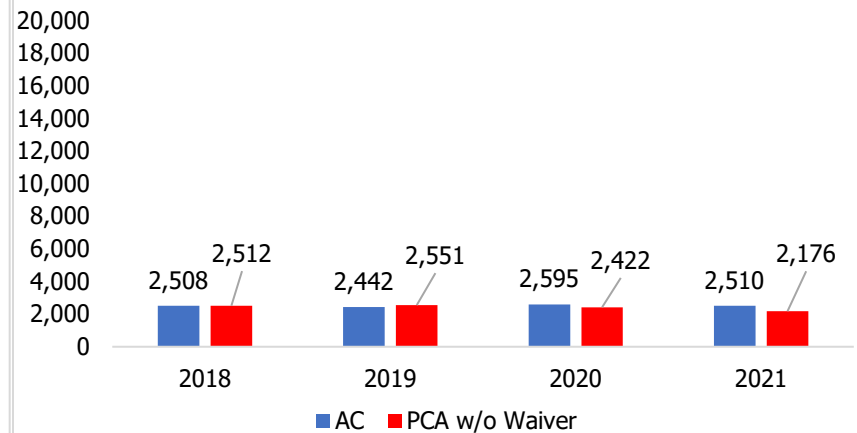


Figure 4. Number of Alternative Care and PCA w/o Waiver Participants on March 1, 2018-2021



Demographic Characteristics of Nursing Facility Residents

Despite a decline in the use of nursing facilities by residents enrolled in Medicaid, the demographic patterns remained similar between March 2018-2020 and March 2021 (Table 3, Figures 5, 7, 9, 11, 13). Residents were most likely to be age 85 or older, female, widowed, separated or divorced or single never married, white, and residing in nursing facilities in Twin Cities metro area.

Similar demographic patterns held for residents not enrolled in Medicaid (Table 3, Figures 6, 8, 10, 12, 14). The percentage age 85 and older declined and percentage age 65-74 increased over time; otherwise, there were no discernable changes in demographic characteristics over time. Like their Medicaid-enrolled counterparts, residents not enrolled in Medicaid were most likely to be age 85 or older, female, widowed, white, and residing in nursing facilities in Twin Cities metro area.

Table 3. Demographics of Nursing Facility Residents

	2018	2019	2020	2021
Medicaid Residents				
Number of Residents	12023	11824	11455	8715
Age				
65-74	18%	19%	21%	22%
75-84	28%	29%	30%	30%
85+	53%	51%	49%	48%
Gender				
Female	70%	69%	68%	69%
Male	30%	31%	32%	31%
Marital Status				
Married	7%	8%	8%	8%
Widowed	48%	47%	45%	43%
Divorced Separated Single	44%	45%	46%	48%
Race and Ethnicity				
Asian	1%	1%	1%	1%
Black/African American	4%	4%	4%	4%
Hispanic	1%	1%	1%	1%
Native American	1%	1%	1%	1%
Multiple Race	0%	0%	0%	0%
White (non-Hispanic)	93%	93%	93%	92%
Other Race/Ethnicity	7%	7%	7%	8%
County Location				
Twin Cities	53%	53%	54%	53%
Other Metro	6%	6%	6%	6%
Outlying a Metro Area	6%	6%	6%	6%
Rural	35%	34%	34%	34%

	2018	2019	2020	2021
<u>Non-Medicaid Residents</u>				
Number of Residents	6104	5924	5744	5557
Age				
65-74	10%	11%	11%	14%
75-84	24%	24%	25%	27%
85+	66%	65%	64%	60%
Gender				
Female	62%	61%	59%	60%
Male	38%	39%	41%	40%
Marital Status				
Married	31%	33%	33%	33%
Widowed	54%	52%	51%	48%
Divorced Separated Single	15%	15%	16%	19%
Race and Ethnicity				
Asian	0%	0%	0%	0%
Black/African American	1%	1%	1%	1%
Hispanic	0%	0%	0%	0%
Native American	0%	0%	0%	0%
Multiple Race	0%	0%	0%	0%
White (non-Hispanic)	99%	98%	98%	98%
Other Race/Ethnicity	1%	2%	2%	2%
County Location				
Twin Cities	51%	50%	50%	51%
Other Metro	9%	9%	9%	8%
Outlying a Metro Area	6%	6%	7%	7%
Rural	34%	34%	34%	35%

Figure 5. Age of Medicaid Nursing Facility Residents on March 1, 2018-2021

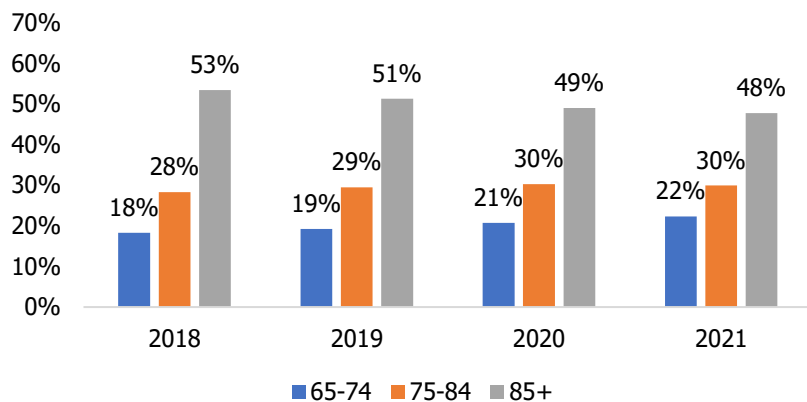


Figure 6. Age of Non-Medicaid Nursing Facility Residents on March 1, 2018-2021

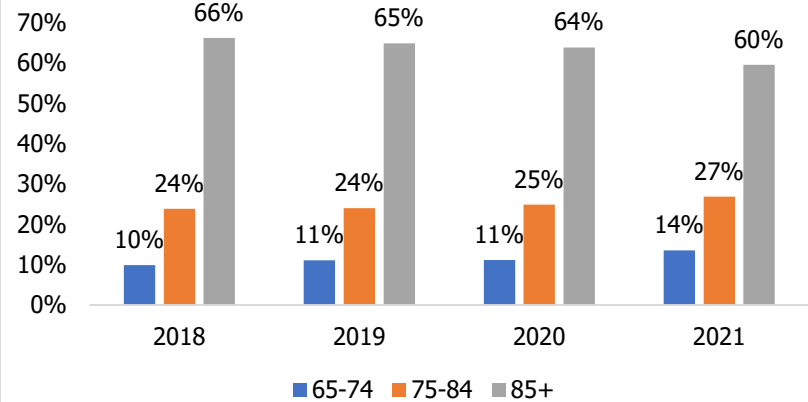


Figure 7. Gender of Medicaid Nursing Facility Residents on March 1, 2018-2021

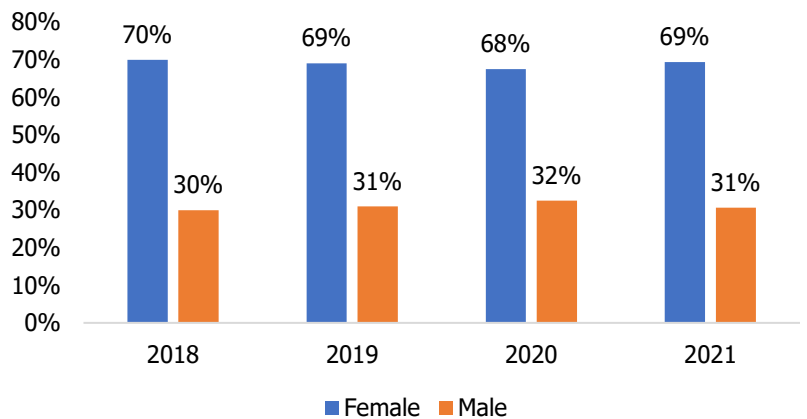


Figure 8. Gender of Non-Medicaid Nursing Facility Residents on March 1, 2018-2021

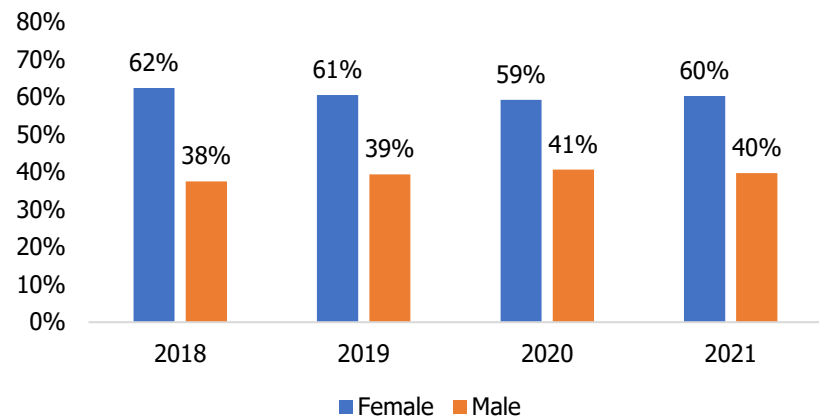


Figure 9. Marital Status of Medicaid Nursing Facility Residents on March 1, 2018-2021

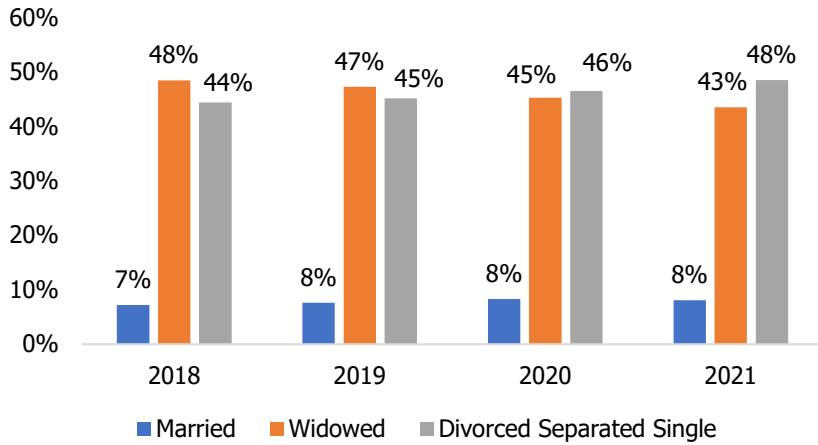


Figure 10. Marital Status of Non-Medicaid Nursing Facility Residents on March 1, 2018-2021

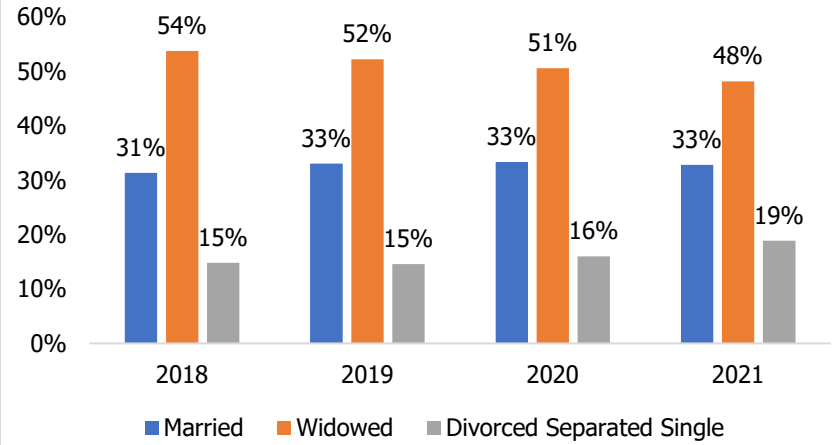


Figure 11. Race/Ethnicity of Medicaid Nursing Facility Residents on March 1, 2018-2021

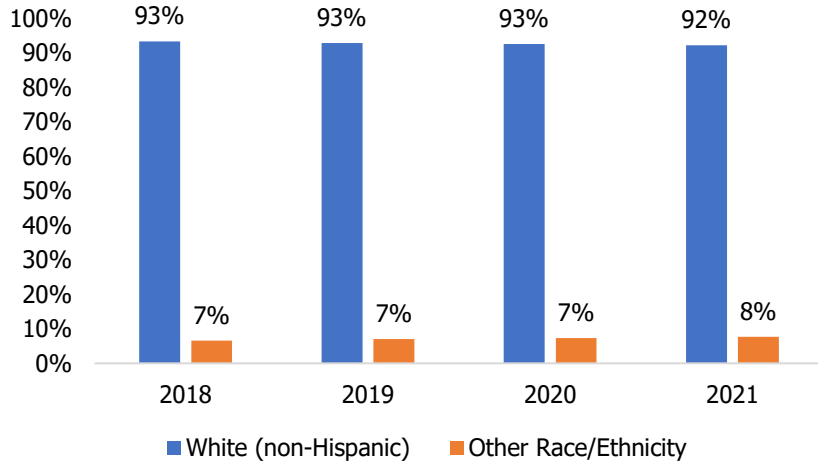


Figure 12. Race/Ethnicity of Non-Medicaid Nursing Facility Residents on March 1, 2018-2021

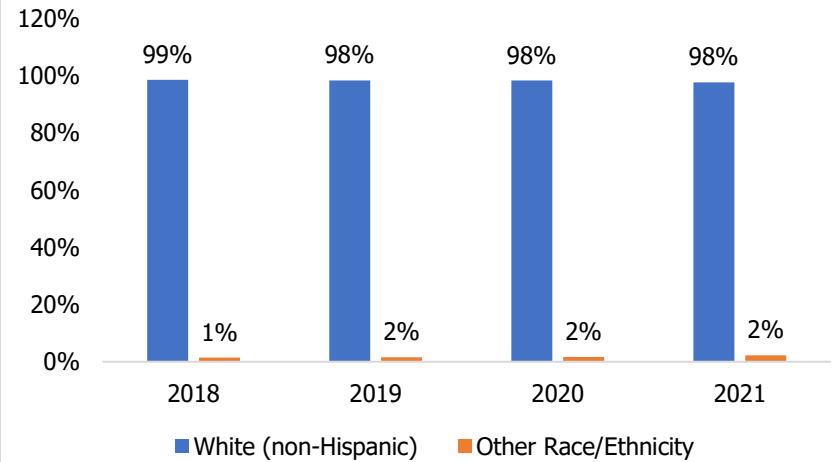


Figure 13. Residential County of Medicaid Nursing Facility Residents on March 1, 2018-2021

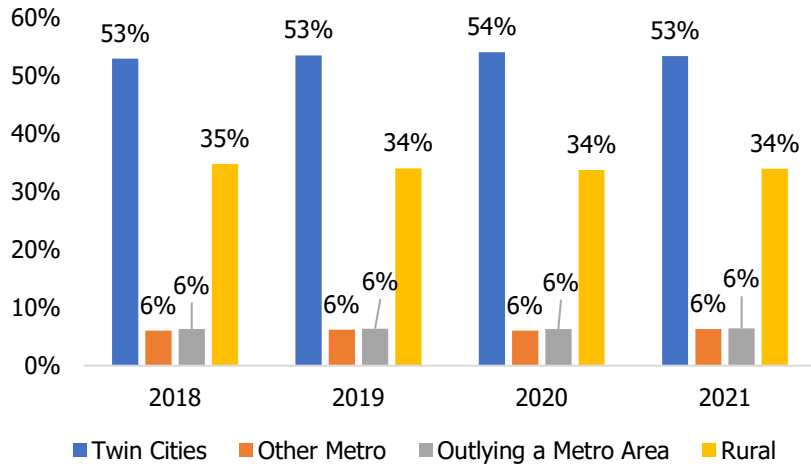
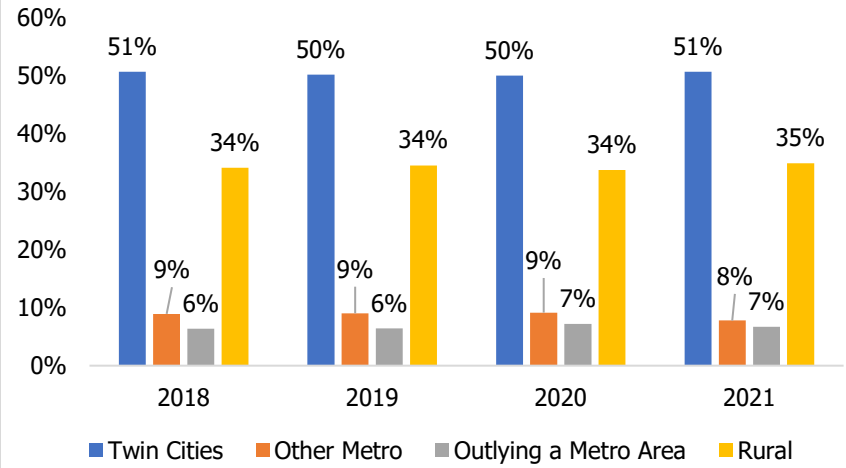


Figure 14. Residential County of Non-Medicaid Nursing Facility Residents on March 1, 2018-2021



Admission Source and Functional Characteristics of Nursing Facility Residents

The sources of admission and functional characteristics of nursing facility residents, both Medicaid and Non-Medicaid, remained remarkably similar between March 2018-2020 and March 2021 (Table 4). The majority of residents continued to be admitted from acute care hospitals (Figures 15-16); and they were most likely to be cognitively intact or moderately cognitively impaired (Figures 17-18); highly dependent in activities of daily living (ADLs) (Figures 19-22), and experiencing frequent bowel or bladder incontinence (Figures 23-24). About one in five residents was experiencing frequent behavioral problems (Figures 23-24).

Table 4. Admission Source and Functional Characteristics of Nursing Facility Residents

	2018	2019	2020	2021
Medicaid Residents				
Prior NF use before current admission	20%	21%	22%	20%
Admitted from				
Acute care	57%	59%	59%	58%
NF transfer	23%	22%	21%	21%
Directly from the community	16%	17%	17%	18%
Rehabilitation or MH facility	3%	3%	3%	3%
Cognitive Status				
Intact	48%	49%	52%	51%
Mild impairment	1%	1%	1%	1%
Moderate impairment	40%	41%	39%	39%
Severe impairment	10%	9%	9%	9%
ADL Dependency				
Eating	22%	22%	20%	21%
Transferring	81%	82%	81%	82%
Bed mobility	82%	83%	82%	83%
Toileting	88%	88%	88%	88%
Mean ADL dependencies	2.74	2.75	2.72	2.75
Daily behavioral problems	22%	20%	19%	18%
Bladder or bowel incontinence	68%	68%	68%	70%

	2018	2019	2020	2021
<u>Non-Medicaid Residents</u>				
Prior NF use before current admission	28%	28%	28%	29%
Admitted from				
Acute care	61%	61%	60%	63%
NF transfer	23%	24%	24%	22%
Directly from the community	13%	14%	14%	14%
Rehabilitation or MH facility	2%	2%	2%	2%
Cognitive Status				
Intact	48%	49%	50%	51%
Mild impairment	1%	1%	1%	1%
Moderate impairment	41%	41%	40%	40%
Severe impairment	10%	9%	9%	9%
ADL Dependency				
Eating	24%	23%	21%	21%
Transferring	88%	89%	89%	88%
Bed mobility	88%	89%	89%	89%
Toileting	93%	94%	94%	93%
Mean ADL dependencies	2.94	2.95	2.93	2.91
Daily behavioral problems	19%	19%	19%	17%
Frequent bladder or bowel incontinence	67%	66%	66%	68%

Figure 15. Admission Source of Medicaid Nursing Facility Residents on March 1, 2018-2021

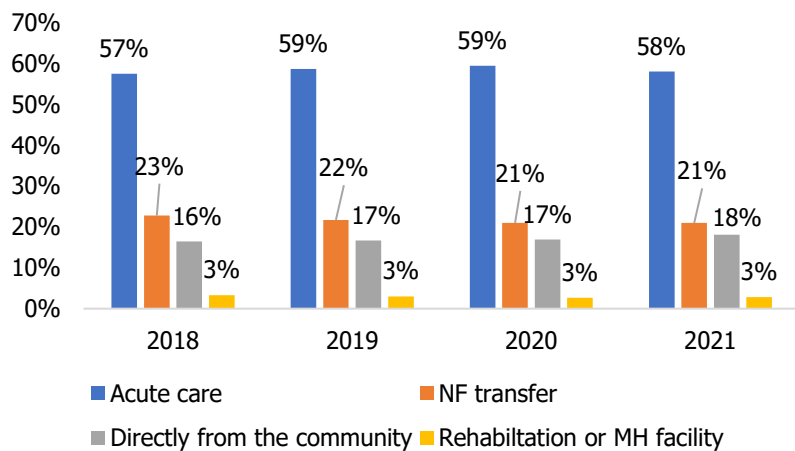


Figure 16. Admission Source of Non-Medicaid Nursing Facility Residents on March 1, 2018-2021

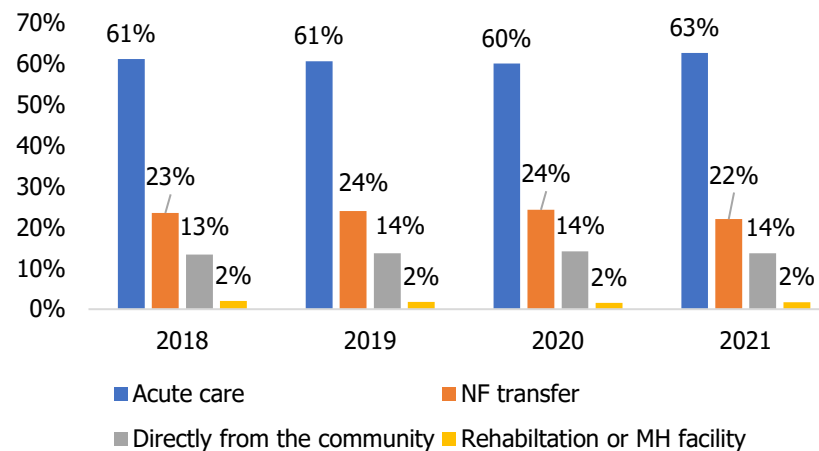


Figure 17. Cognitive Status of Medicaid Nursing Facility Residents on March 1, 2018-2021

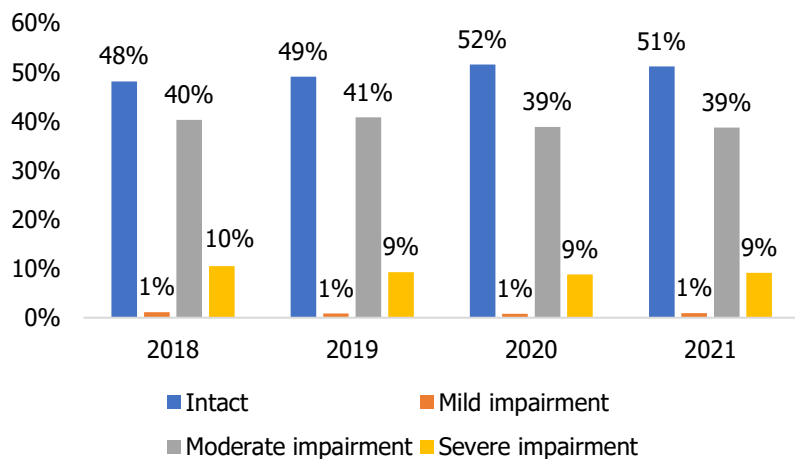


Figure 18. Cognitive Status of Non-Medicaid Nursing Facility Residents on March 1, 2018-2021

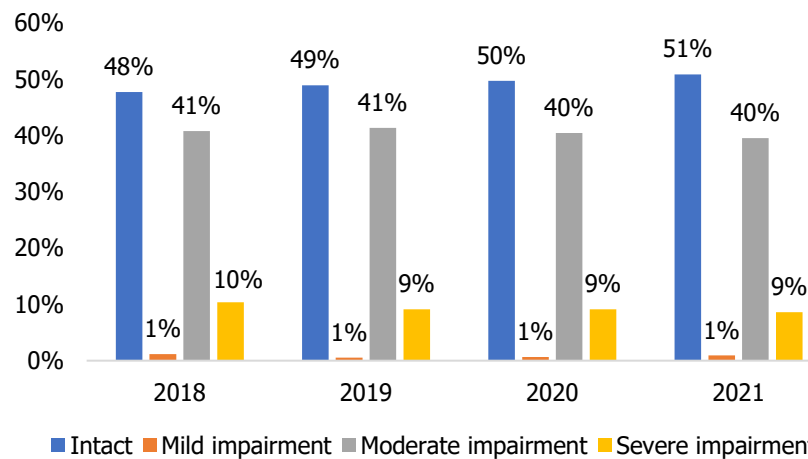


Figure 19. ADL Dependencies of Medicaid Nursing Facility Residents on March 1, 2018-2021

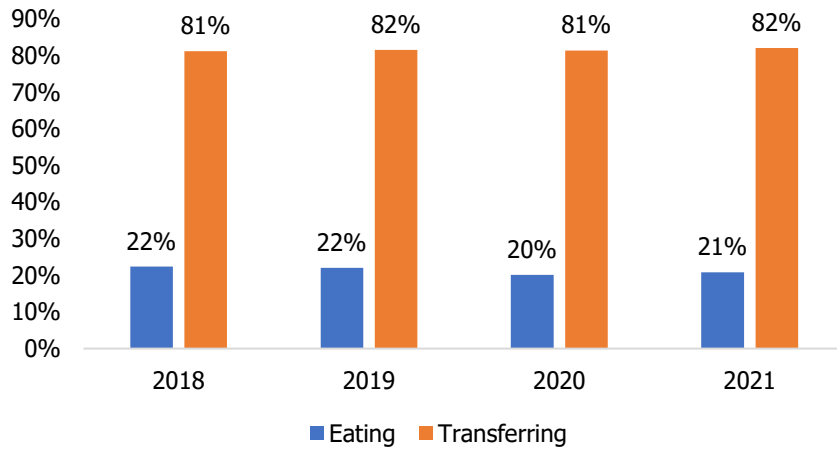


Figure 20. ADL Dependencies of Non-Medicaid Nursing Facility Residents on March 1, 2018-2021

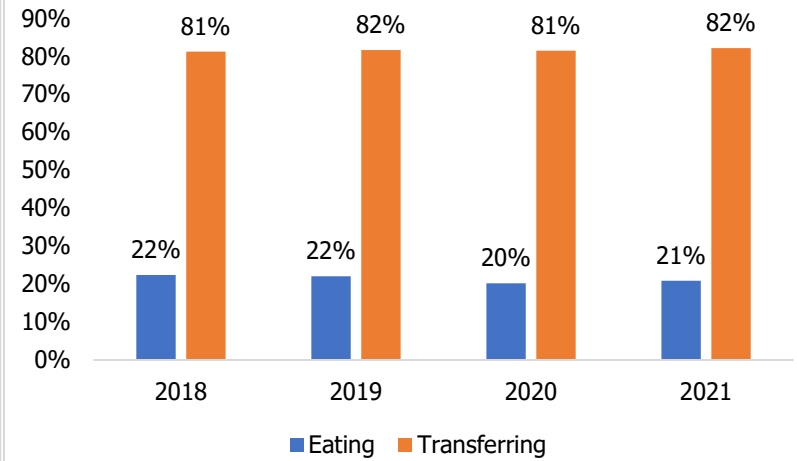


Figure 21. ADL Dependencies of Medicaid Nursing Facility Residents on March 1, 2018-2021

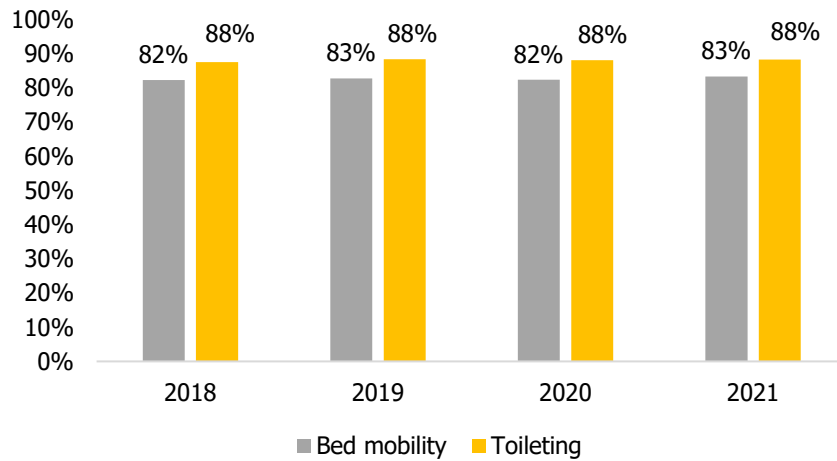


Figure 22. ADL Dependencies of Non-Medicaid Nursing Facility Residents on March 1, 2018-2021

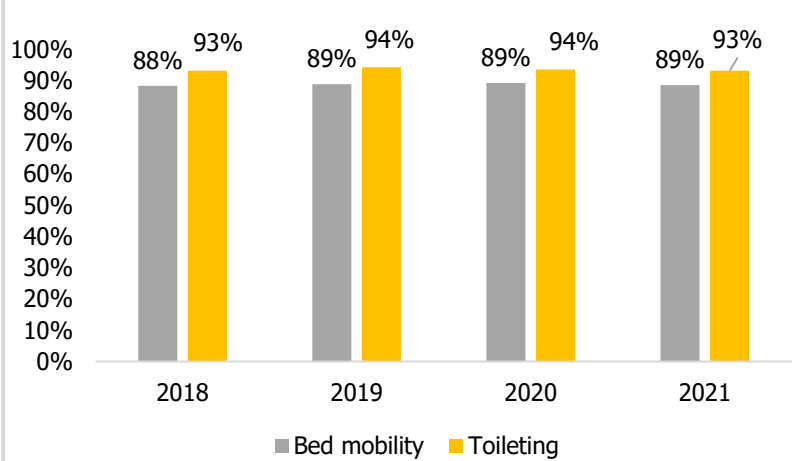


Figure 23. Behavioral Problems and Incontinence of Medicaid Nursing Facility Residents, March 1, 2018-2021

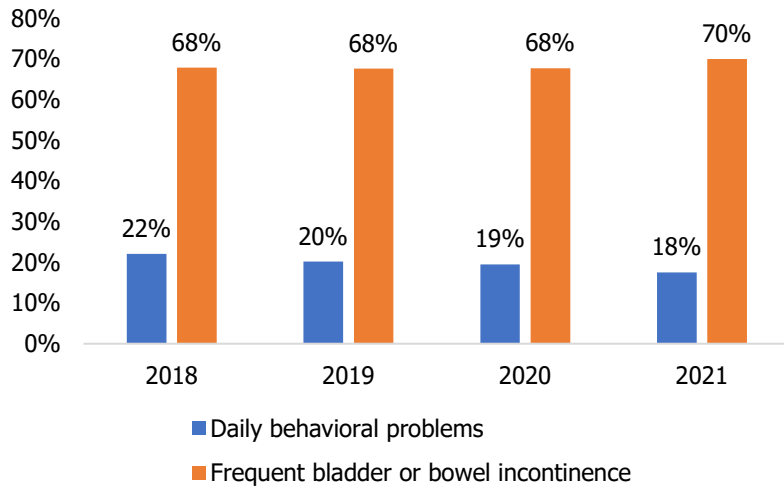
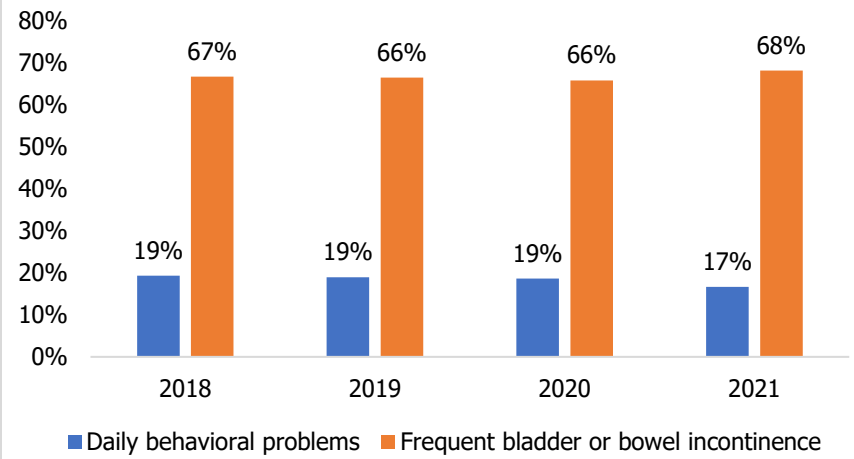


Figure 24. Behavioral Problems and Incontinence of Non-Medicaid Nursing Facility Residents, March 1, 2018-2021



Demographic Characteristics of Elderly Waiver, Alternative Care and PCA (without a Waiver) Participants

For those enrolled in EW, AC, and PCA (without a Waiver), the demographic patterns remained similar between March 2018-2020 and March 2021 (Table 5, Figures 25-44). EW- Residential participants were most likely to be age 85 or older, female, widowed or separated or divorced or single never married, White, and residing in the Twin Cities metro area. EW- Community participants were most likely to be age 65-84, female, divorced or separated or single never married, White, and residing in the Twin Cities metro area. AC participants were spread fairly evenly across age groups and were most likely to be female, widowed or separated or divorced or single never married, White, and residing in the Twin Cities metro area. Participants in PCA without a Waiver were most likely to be age 65-74, female, divorced or separated or single never married, Asian, and living in the Twin Cities metro area.

Table 5. Demographic Characteristics of Elderly Waiver, Alternative Care, and PCA Users

	2018	2019	2020	2021
<u>Elderly Waiver - Residential</u>				
Number of Participants	9389	9618	10046	9390
Age				
65-74	16%	17%	18%	20%
75-84	33%	33%	33%	34%
85+	51%	50%	48%	46%
Gender				
Female	75%	75%	74%	72%
Male	25%	25%	26%	28%
Marital Status				
Married	5%	4%	5%	6%
Widowed	50%	50%	48%	45%
Divorced Separated Single	45%	46%	47%	49%
Race and Ethnicity				
Asian	2%	2%	2%	2%
Black/African American	2%	3%	3%	3%
Hispanic	1%	1%	1%	1%
Native American	1%	1%	1%	1%
Multiple Race	0%	0%	0%	0%
White (non-Hispanic)	94%	94%	93%	93%
County Location				
Twin Cities	55%	56%	56%	56%
Other Metro	9%	9%	9%	9%
Outlying a Metro Area	6%	6%	6%	6%
Rural	30%	29%	29%	28%
<u>Elderly Waiver Community</u>				
Number of Participants	16317	16996	17565	17589
Age				
65-74	40%	41%	41%	40%
75-84	40%	40%	40%	40%
85+	20%	19%	19%	20%

	2018	2019	2020	2021
Gender				
Female	70%	69%	69%	69%
Male	30%	31%	31%	31%
Marital Status				
Married	15%	13%	14%	15%
Widowed	31%	32%	30%	29%
Divorced Separated Single	54%	55%	56%	56%
Race and Ethnicity				
Asian	20%	20%	21%	21%
Black/African American	24%	24%	26%	27%
Hispanic	3%	3%	3%	3%
Native American	2%	2%	2%	2%
Multiple Race	0%	0%	0%	0%
White (non-Hispanic)	51%	50%	48%	47%
County Location				
Twin Cities	73%	74%	75%	76%
Other Metro	5%	5%	4%	4%
Outlying a Metro Area	4%	3%	3%	3%
Rural	19%	18%	17%	17%
Alternative Care Waiver				
Number of Participants	2508	2442	2595	2510
Age				
65-74	26%	27%	30%	29%
75-84	37%	38%	38%	41%
85+	36%	34%	32%	30%
Gender				
Female	73%	73%	72%	72%
Male	27%	27%	28%	28%
Marital Status				
Married	12%	11%	12%	12%
Widowed	45%	44%	41%	37%
Divorced Separated Single	43%	45%	47%	50%
Race and Ethnicity				
Asian	1%	1%	1%	1%
Black/African American	6%	7%	7%	8%
Hispanic	1%	1%	1%	1%
Native American	1%	1%	1%	1%
Multiple Race	0%	0%	0%	0%
White (non-Hispanic)	91%	90%	90%	88%
County Location				
Twin Cities	68%	70%	72%	74%
Other Metro	5%	5%	4%	4%
Outlying a Metro Area	6%	6%	6%	6%
Rural	21%	20%	18%	17%

	2018	2019	2020	2021
PCA (without a Waiver)				
Number of Participants	2512	2551	2422	1984
Age				
65-74	53%	54%	55%	54%
75-84	32%	30%	29%	30%
85+	16%	15%	15%	16%
Gender				
Female	65%	64%	64%	65%
Male	35%	36%	36%	35%
Marital Status				
Married	20%	19%	21%	24%
Widowed	34%	35%	32%	32%
Divorced Separated Single	45%	46%	47%	45%
Race and Ethnicity				
Asian	49%	47%	48%	51%
Black/African American	28%	29%	28%	26%
Hispanic	2%	2%	2%	2%
Native American	5%	5%	5%	5%
Multiple Race	0%	1%	0%	1%
White (non-Hispanic)	16%	16%	17%	15%
County Location				
Twin Cities	82%	80%	79%	76%
Other Metro	6%	6%	7%	8%
Outlying a Metro Area	1%	1%	1%	1%
Rural	11%	13%	14%	14%

Figure 25. Age of EW-Residential Participants on March 1, 2018-2021

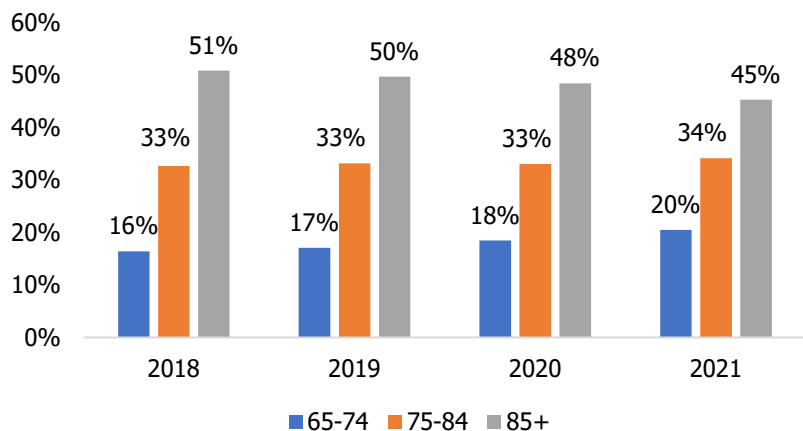


Figure 26. Age of Alternative Care Participants on March 1, 2018-2021

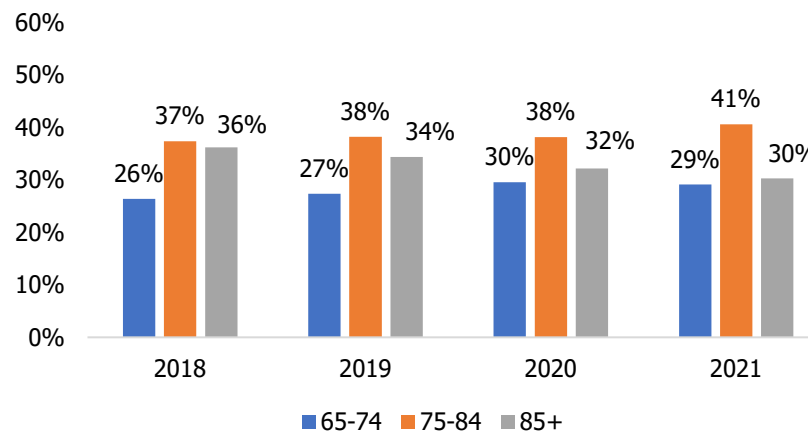


Figure 27. Age of EW-Community Participants on March 1, 2018-2021

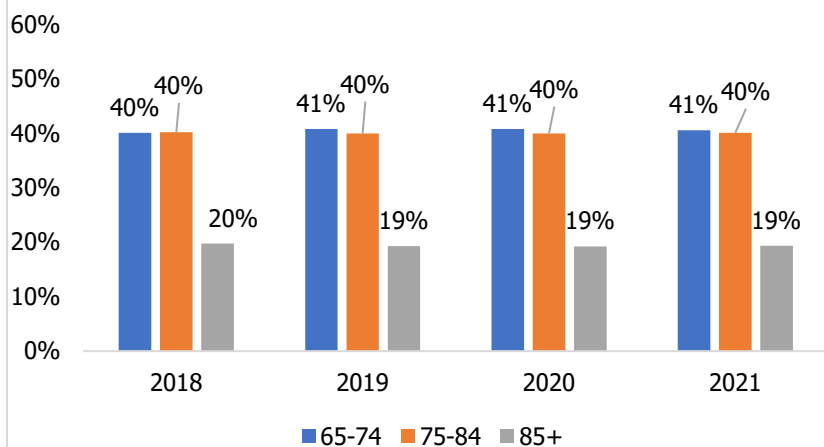


Figure 28. Age of PCA w/o Waiver Participants on March 1, 2018-2021

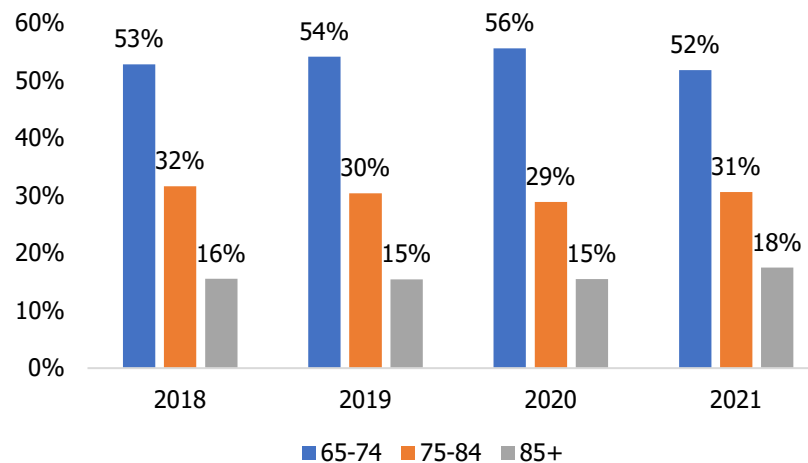


Figure 29. Gender of EW-Residential Participants on March 1, 2018-2021

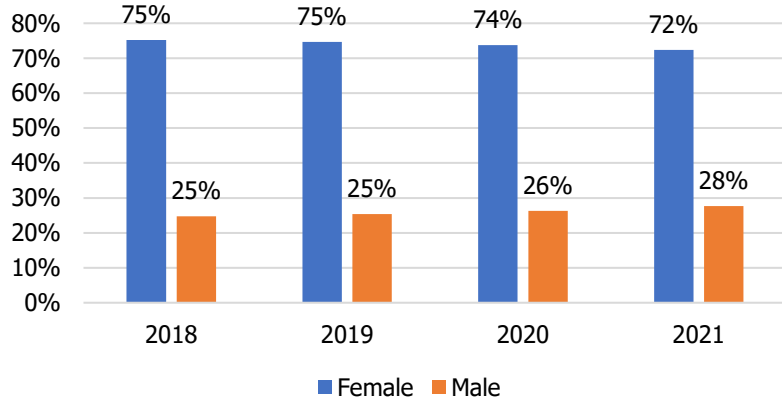


Figure 30. Gender of Alternative Care Participants on March 1, 2018-2021

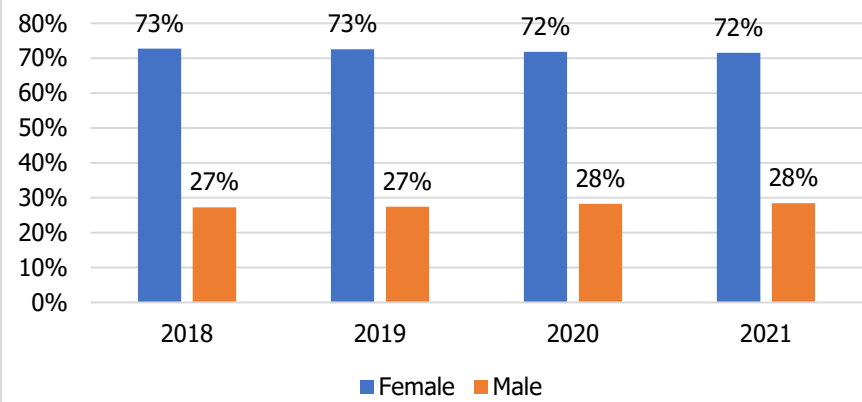


Figure 31. Gender of EW-Community Participants on March 1, 2018-2021

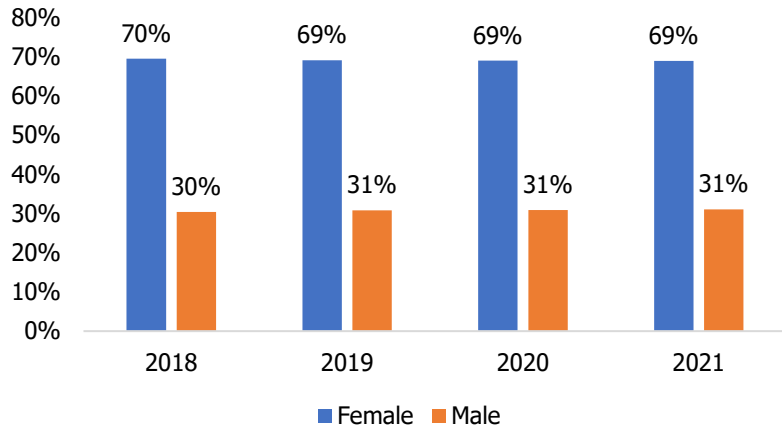


Figure 32. Gender of PCA w/o Waiver Participants on March 1, 2018-2021

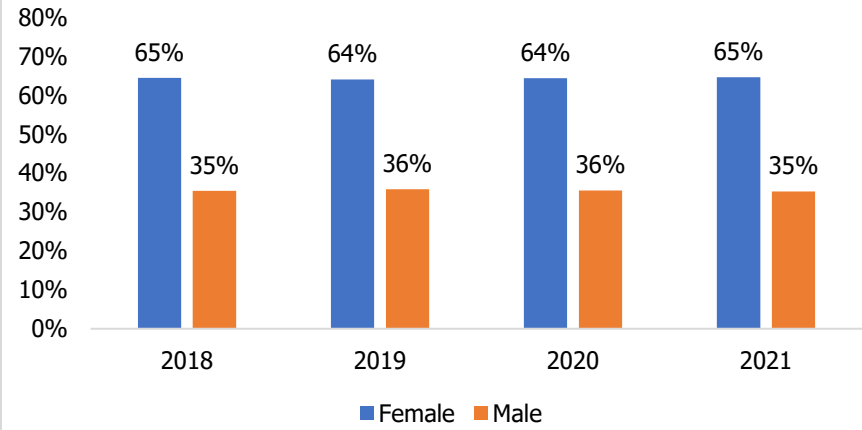


Figure 33. Marital Status of EW-Residential Participants on March 1, 2018-2021

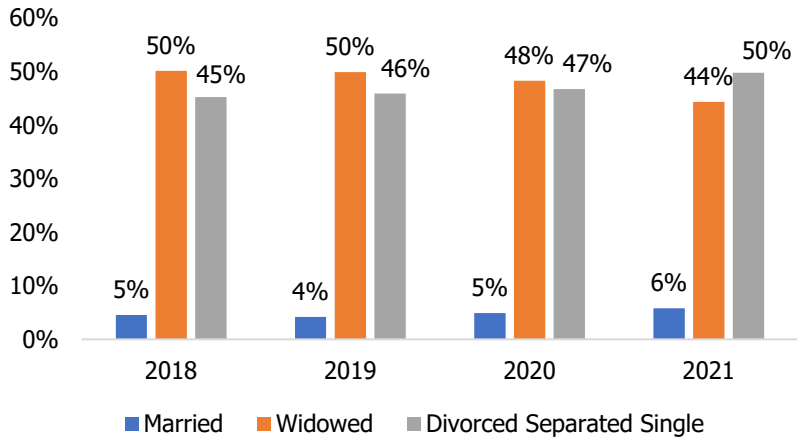


Figure 34. Marital Status of Alternative Care Participants on March 1, 2018-2021

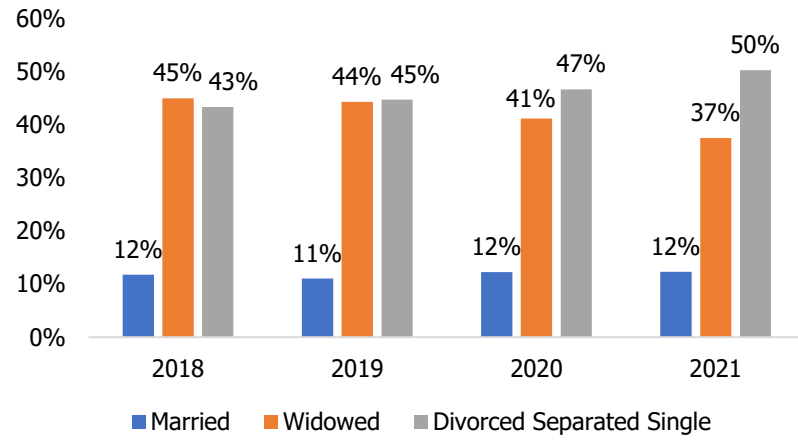


Figure 35. Marital Status of EW-Community Participants on March 1, 2018-2021

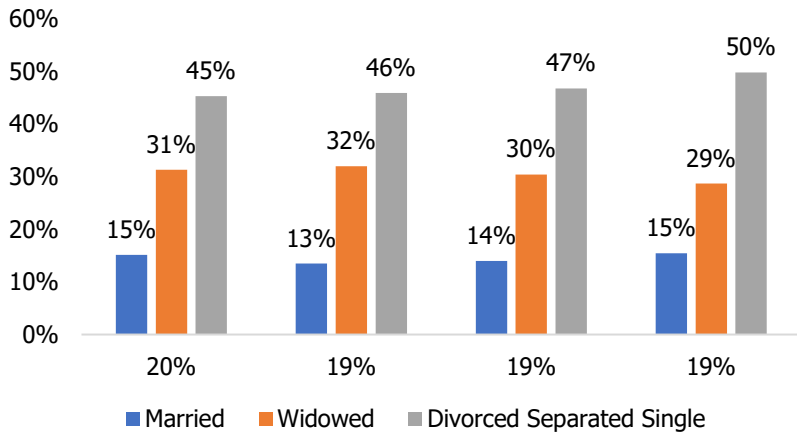


Figure 36. Marital Status of PCA w/o Waiver Participants on March 1, 2018-2021

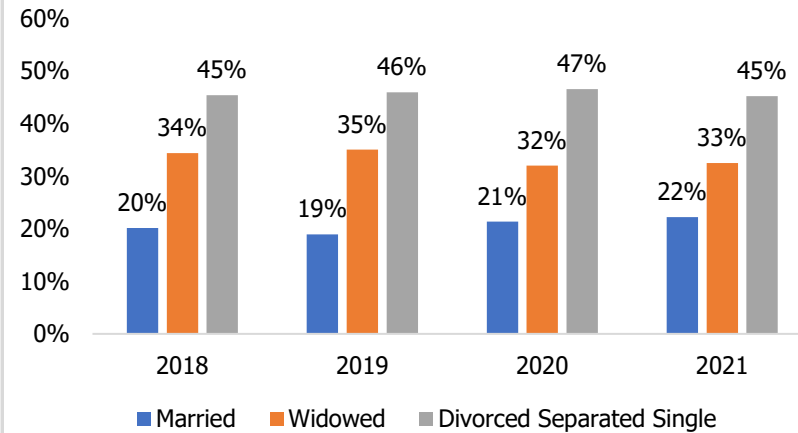


Figure 37. Race/Ethnicity of EW-Residential Participants on March 1, 2018-2021

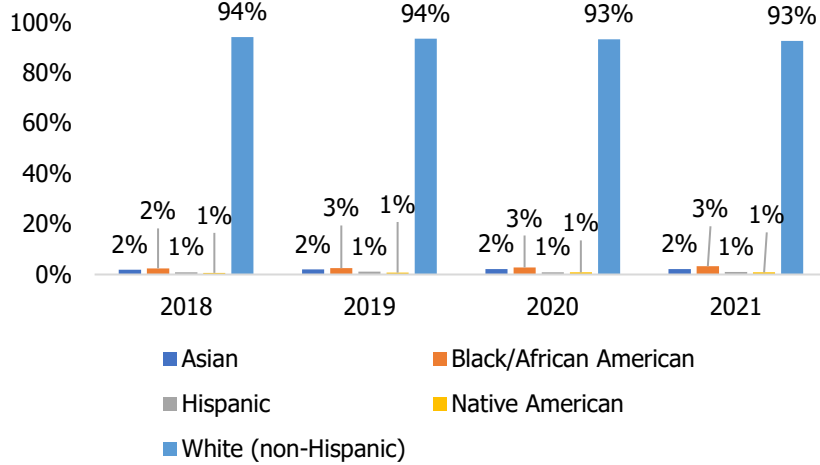


Figure 38. Race/Ethnicity of Alternative Care Participants on March 1, 2018-2021

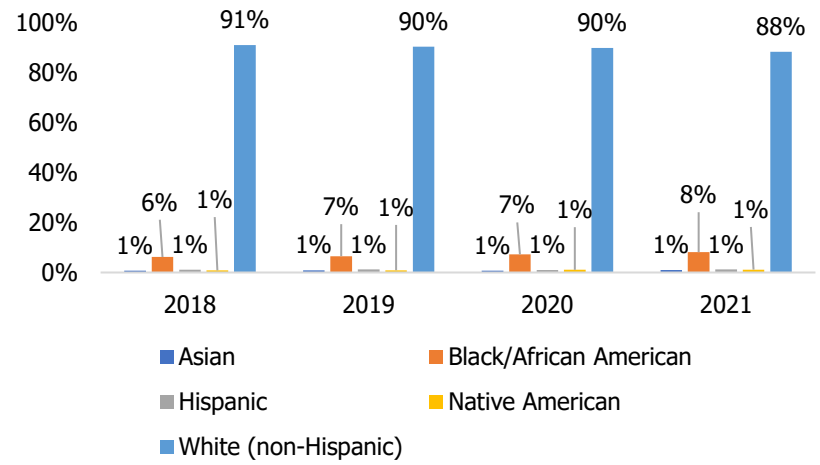


Figure 39. Race/Ethnicity of EW-Community Participants on March 1, 2018-2021

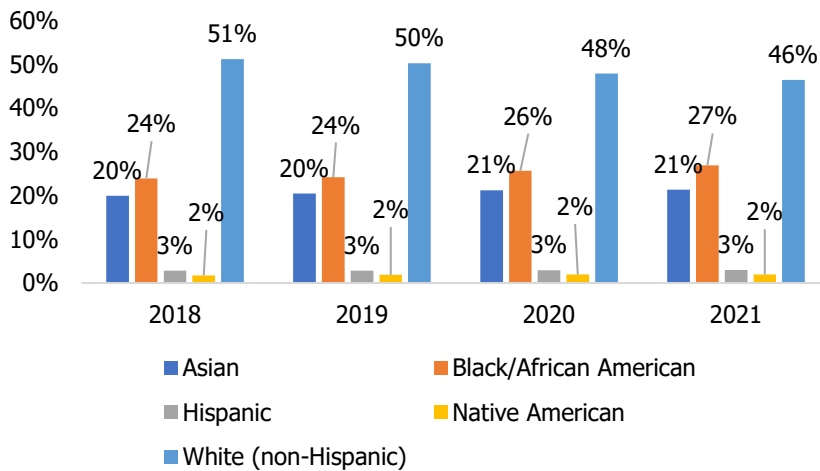


Figure 40. Race/Ethnicity of PCA w/o Waiver Participants on March 1, 2018-2021

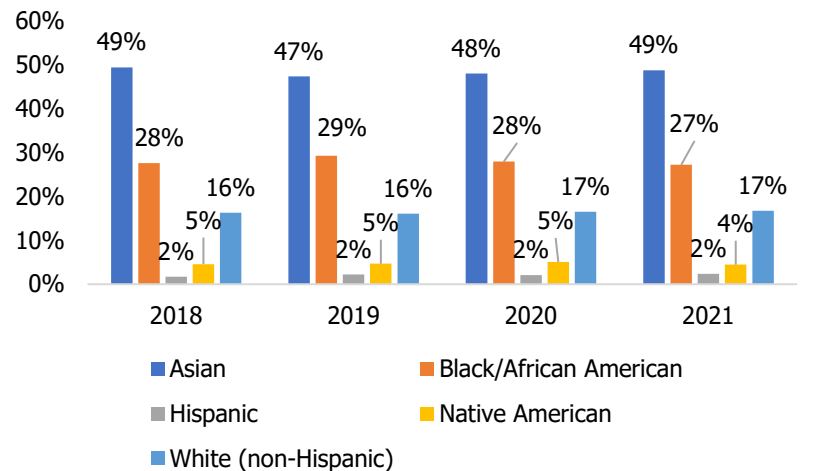


Figure 41. County Location of EW-Residential Participants on March 1, 2018-2021

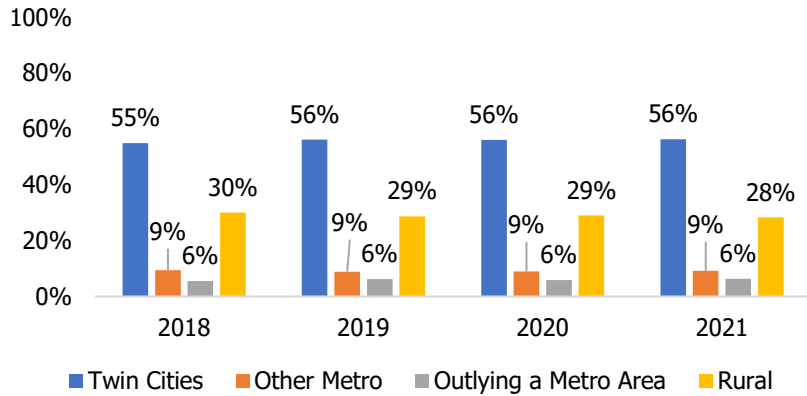


Figure 42. County Location of Alternative Care Participants on March 1, 2018-2021

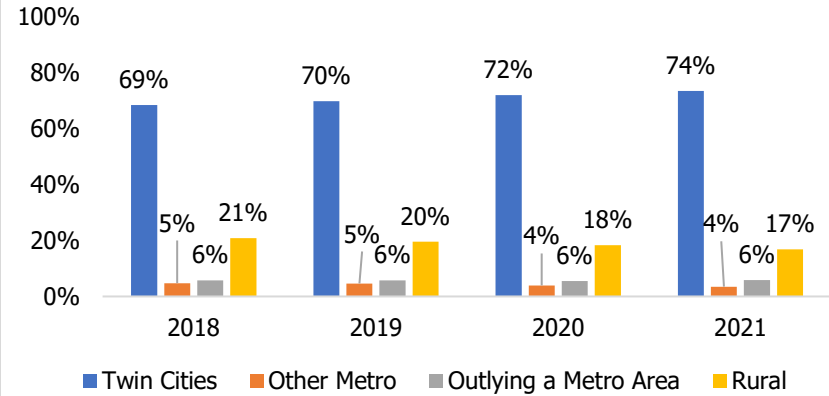


Figure 43. County Location of EW-Community Participants on March 1, 2018-2021

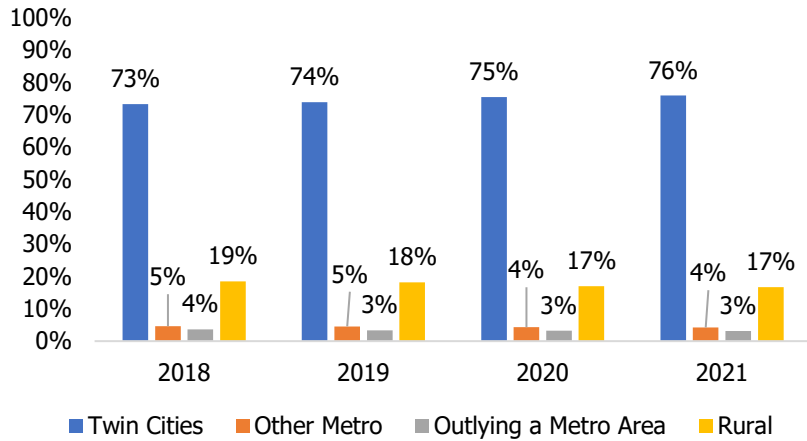
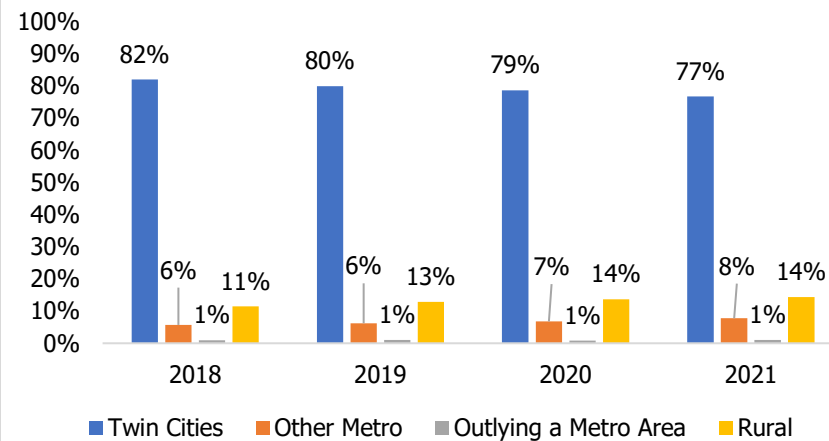


Figure 44. County Location of PCA w/o a Waiver Participants on March 1, 2018-2021



Level of Care (NF-LOC) Criteria for Waiver and other HCBS Participants

Table 6 shows the functional and other characteristics that are considered when determining NF-LOC for Elderly Waiver or Alternative Care participation. Some people who meet NF-LOC may elect to receive PCA other HCBS services without a waiver.

Elderly Waiver – The decline in EW – Residential participation between March 2020 and 2021 was accompanied by lower percentages of participants with 4 or more ADL dependencies (42% to 36%) and with critical ADLs (49% to 43%), and in the average number of criteria met (3.29 to 2.76) (Figure 45). Otherwise, the percentages meeting NF-LOC remained about the same. The percentages meeting NF-LOC criteria among the EW – Community participants remained similar between March 2020 and 2021 (Figure 46). Compared to EW – Community participants, EW – Residential participants were more likely to have Cognitive or Behavioral Risk (92% vs. 69%) and risk of Abuse or Neglect (62% vs. 54%), and less likely to face Institutional Risk (46% vs. 58%) at both time points.

Alternative Care Waiver – All of the percentages meeting NF-LOC among Alternative Care participants remained similar between March 2020 and 2021 (Figure 47). The criteria with the highest percentages in 2021 were Cognitive or Behavioral Risk (85%), Institutional Risk (66%), and Abuse or Neglect (49%). Compared to the Elderly Waiver participants, lower percentages of Alternative Care participants had 4+ ADL dependencies (23%) or Critical ADL dependencies (35%).

PCA without a Waiver – Although the number of people who met NF-LOC yet participated in PCA without a waiver declined between March 2020 and 2021, the percentages meeting NF-LOC criteria changed very little (Figure 48). In comparison to waiver participants at both time points, they had the highest percentage with 4+ ADL dependencies (82%) and Critical ADL dependencies (85%), while their Institutional Risk was the lowest (20%). They also met the highest average number of criteria (3.64).

Table 6. Nursing Facility Level of Care Criteria among Elderly Waiver, Alternative Care, and PCA Users

	2018	2019	2020	2021
Elderly Waiver - Residential				
Number of Participants	9389	9618	10046	9390
4+ ADLs	43%	42%	42%	36%
Critical ADLs	52%	50%	49%	43%
Clinical Monitoring	17%	17%	17%	16%
Cognitive or Behavioral Risk	94%	94%	94%	93%
Institutional Risk	40%	39%	45%	46%
Neglect or Abuse	58%	61%	63%	62%
Number of criteria met	3.26	3.25	3.29	2.76
Elderly Waiver - Community				
Number of Participants	16317	16996	17565	17589
4+ ADLs	35%	37%	38%	38%
Critical ADLs	40%	41%	42%	41%
Clinical Monitoring	5%	5%	5%	5%
Cognitive or Behavioral Risk	69%	70%	70%	69%
Institutional Risk	58%	59%	59%	58%
Neglect or Abuse	49%	52%	54%	54%
Number of criteria met	2.61	2.67	2.71	2.53
Alternative Care Waiver				
Number of Participants	2508	2442	2595	2510
4+ ADLs	24%	24%	24%	23%
Critical ADLs	36%	36%	36%	35%
Clinical Monitoring	14%	13%	14%	14%
Cognitive or Behavioral Risk	83%	85%	85%	85%
Institutional Risk	66%	68%	67%	66%
Neglect or Abuse	47%	51%	51%	49%
Number of criteria met	2.83	2.91	2.95	2.44
Personal Care Assistant w/o a Waiver				
Number of Participants	2512	2551	2422	1984
4+ ADLs	76%	81%	81%	82%
Critical ADLs	79%	85%	85%	85%
Clinical Monitoring	6%	6%	6%	5%
Cognitive or Behavioral Risk	79%	83%	82%	82%
Institutional Risk	19%	22%	22%	20%
Neglect or Abuse	35%	40%	43%	42%
Number of criteria met	3.44	3.66	3.66	3.64

Figure 45. Elderly Waiver - Residential Participants by NF-LOC Criteria on March 1, 2018-2021

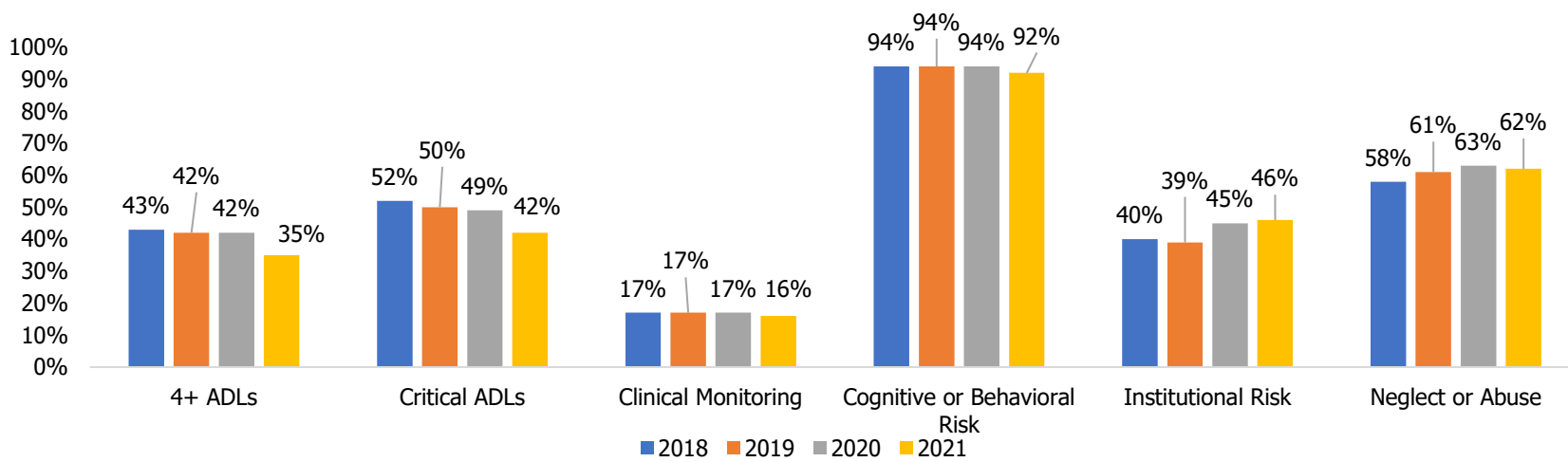


Figure 46. Elderly Waiver - Community Participants by NF-LOC Criteria on March 1, 2018-2021

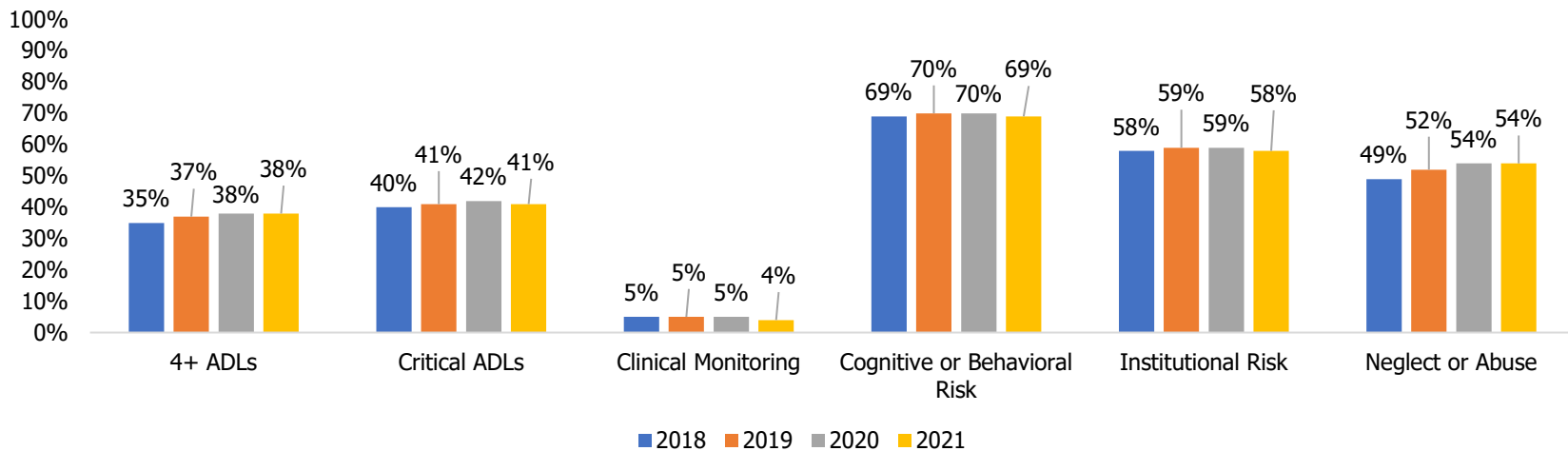


Figure 47. Alternative Care Waiver Participants by NF-LOC Criteria on March 1, 2018-2021

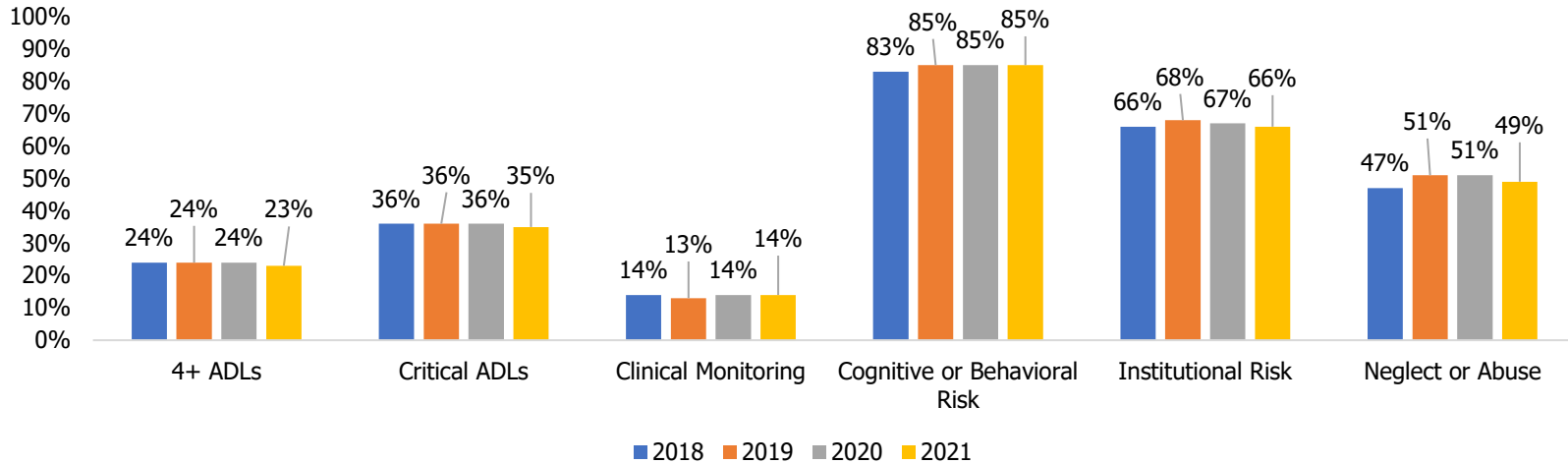
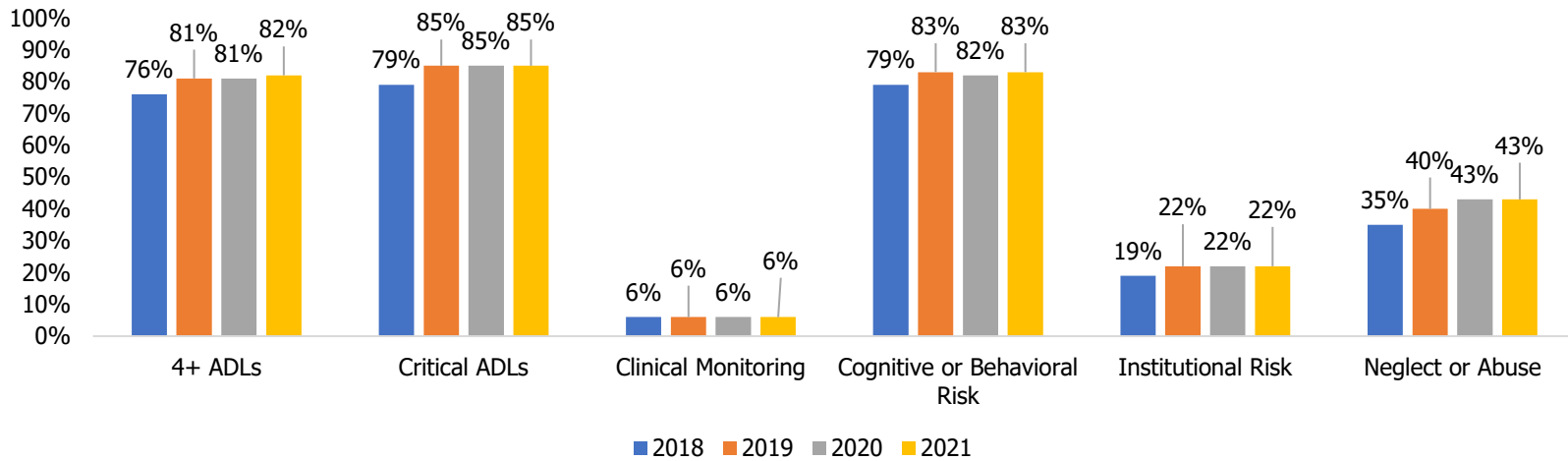


Figure 48. PCA without a Waiver participants by NF-LOC Criteria on March 1, 2018-2021



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

The March cohorts were followed for 12 months (through February of the following year) to determine 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. People in all LTSS categories experienced relatively high mortality over the future 24 months both in the 2018 cohort before the COVID-19 pandemic and the 2020 cohort during the pandemic (Table 7, Figures 49-50).

Nursing Facility Residents - The rate of mortality among nursing facility residents, already much higher than for waiver and PCA participants, rose substantially in 2020 during the first 12 months of the COVID-19 pandemic. 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 (Table 7, Figure 49). 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.

Waiver and PCA Participants - EW- Residential participants had lower mortality rates than nursing facility residents but much higher mortality rates than participants in the EW-Community, Alternative Care, and PCA without a waiver (Table 7, Figure 50). Following the same pattern as among nursing facility residents, mortality rates for EW- Residential participants 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.

Mortality rates for participants in the EW- Community, 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 7. 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	3329	3426	4058	2442	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	1676	1663	1961	1459	357	363	449	364
EW-Residential	1835	1891	2445	1941	195	197	243	207
EW-Community	1012	1096	1381	1373	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	5885	5946	6980	4656	325	335	406	326
EW Residential	1835	1891	2445	1941	195	197	243	207
EW Community, AC & PCA	1424	1499	1836	1780	67	68	81	81
All LTSS	9144	9336	11261	8377	187	189	226	183

Figure 49. Deaths/1000 of Nursing Facility Residents, March Cohorts Followed for 12 Months

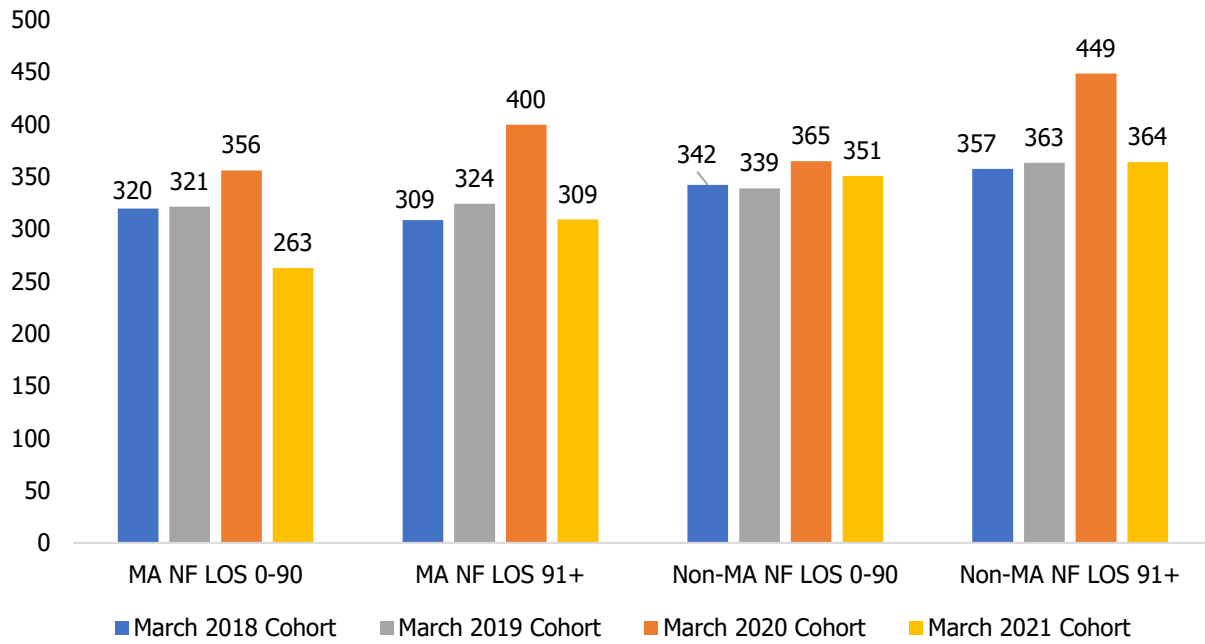
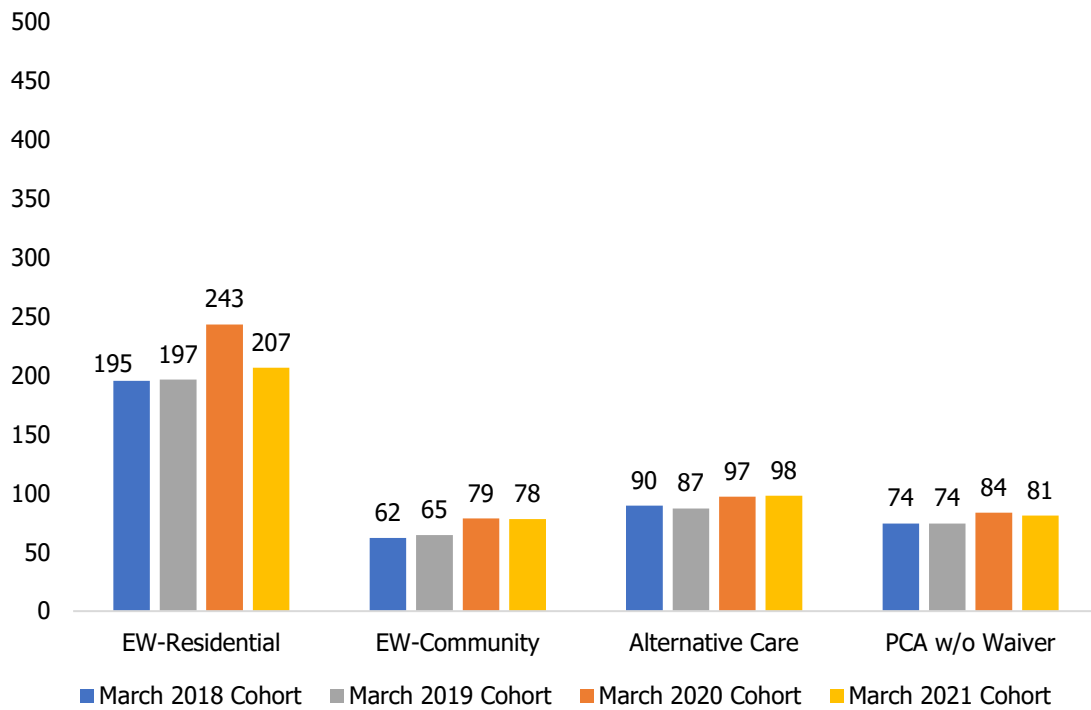


Figure 50. Deaths/1000 of Waiver and PCA Participants, March Cohorts Followed for 12 Months



Number of transitions between LTSS categories for cohorts beginning in March 2018 and 2020

Transitions between the initial and subsequent LTSS categories are shown in Tables 8 and 9 and Figures 51-62. Cohorts beginning in March of 2018 and 2020 were followed for 24 months, through February 2020 and February 2022, respectively. A person could make multiple transitions over the 24 months. For example, people could transition from a nursing facility to a waiver program or transition back into a nursing facility. Also in both periods, before and during the pandemic, a substantial percentage of people in each category died before the end of the 24 months (Table 9).

Table 8 shows the number of transitions into new LTSS categories according to the initial LTSS category in March 2018 or March 2020. Although the majority of people in all of the LTSS categories remained in their initial category, there was variation in the number transitioning to a new category. Medicaid nursing facility residents, particularly long-stay residents, were least likely to make a transition to a new LTSS category. A total of 91% of Medicaid residents in March 2018 and 93% of Medicaid residents in March 2020 remained in the nursing facility until death or the end of the 24 months. Among nursing facility residents not enrolled in Medicaid, the percentage remaining was 83% in March 2018 and 91% in March 2020. Among the other LTSS categories, Alternative Care participants were most likely to make a transition in both periods: 47% of participants in the 2018 cohort and 38% of participants in the 2020 cohort. Next most likely were EW-Residential participants: 45% of participants in the 2018 cohort and 38% of participants in the March 2020 cohort made a transition. Across these and all other initial LTSS categories, the percentage of people making a transition to a new category declined between 2018 and 2020. This could have been the result of higher mortality rates in the 2020 cohort during the COVID-19 pandemic (see Table 9). With shorter life expectancy, there was less opportunity to transition.

Table 8. Number of Transitions to a New LTSS Category over 24 Months for Cohorts in March 2018 and 2020

Starting LTSS Category	Number of Subsequent Transitions			
	None	1	2	3 or More
March 2018				
MA NF LOS 0-90 Days	64%	28%	8%	0%
MA NF LOS 91+ Days	94%	5%	1%	0%
MA NF Total	91%	7%	1%	0%
Non-MA NF LOS 0-90 Days	83%	15%	1%	1%
Non-MA NF LOS 91+ Days	83%	17%	0%	0%
Non-MA NF Total	83%	17%	0%	0%
EW-Residential	55%	33%	12%	0%
EW-Community	73%	22%	4%	0%
Alternative Care	53%	29%	14%	6%
PCA w/o Waiver	67%	30%	3%	0%
March 2020				
MA NF LOS 0-90 Days	70%	22%	7%	1%
MA NF LOS 91+ Days	96%	3%	1%	0%
Non-MA NF LOS 0-90 Days	90%	8%	1%	1%
Non-MA NF LOS 91+ Days	91%	9%	0%	0%
MA NF Total	93%	5%	1%	0%
Non-MA NF Total	91%	8%	0%	0%
EW-Residential	62%	28%	10%	0%
EW-Community	80%	16%	3%	0%
Alternative Care	62%	25%	9%	4%
PCA w/o Waiver	76%	22%	2%	0%

Initial and subsequent LTSS categories for cohorts beginning in March 2018 and March 2020

Table 9 and Figures 51-62 show the percentage of people moving from each initial LTSS category into each subsequent category. Compared to the March 2018 cohort, the March 2020 cohort experienced an increase in mortality. In addition, there were both increases and declines in transitions from initial LTSS categories to new LTSS categories in the subsequent 24 months.

Transitions for people not enrolled initially in Medicaid - Relatively few nursing facility residents not enrolled in Medicaid initially ended up converting to Medicaid over the following 24 months. Their conversion to Medicaid while in the nursing facility was 17% in the March 2018 cohort and 8% in the March 2020 cohort. Only 1% of nursing facility residents not enrolled in Medicaid transitioned to Alternative Care and only 1% converted to Medicaid and entered an EW-Residential setting. Conversion to Medicaid among Alternative Care participants was much higher. Among AC participants in March 2018, 29% converted to Medicaid. Of these people, 21% had nursing facility stay while enrolled in Medicaid, 13% entered an EW-Residential setting, and 8% participated in an EW-Community waiver. The percentages declined in the March 2020 cohort to 16% with a nursing facility stay while enrolled in Medicaid, 11% entering an EW-Residential setting, and 7% participating in the EW-Residential program.

Sizable percentages of Alternative Care participants transitioned to a nursing facility without converting to Medicaid: 29% of the March 2018 cohort and 26% of the March 2020 cohort. In the 2018 cohort, 9% of Alternative Care participants who entered a nursing home while not enrolled in Medicaid ended up converting to Medicaid while in the facility (figures not reported in the table). That figure dropped to 7% in the March 2020 cohort.

Transitions for people enrolled in Medicaid - Longer-stay nursing facility residents enrolled in Medicaid were unlikely to enter an Elderly Waiver program or other setting. However, 17% of short-stay Medicaid nursing facility residents in March 2018 entered an EW-Residential setting and 21% participated in an EW-Community program. Those figures increased to 18% and 25%, respectively, for the March 2020 cohort. Among EW-Residential participants in March 2018, 33% entered a nursing facility and 24% participated in an EW-Community program. In the March 2020 cohort, 30% of EW-Residential participants entered a nursing facility while 23% participated in an EW-Community waiver. Over the same two periods, the percentage of EW-Community participants entering a nursing facility decreased from 20% to 18% and the percentage entering an EW-Residential waiver dropped slightly from 8% to 7%. Finally, among PCA users without a waiver, 28% transitioned to an EW-Waiver program in the March 2018 cohort and 26% in the March 2020 cohort, and only 9% transitioned to a nursing facility in the March 2018 and 8% in the March 2020 cohort.

Table 9. Mortality and LTSS Categories over 24 Months for Cohorts in March 2018 and 2020

Category in March	Mortality and Use of Care during Next 24 Months						
	Mortality	MA NF	Non-MA NF	EW Residential	EW Community	Alternative Care	PCA w/o Waiver
March 2018							
Non-MA NF Total	55%	17%	100%	1%	0%	1%	0%
Non-MA NF LOS 0-90	48%	15%	100%	2%	1%	3%	0%
Non-MA NF LOS 91+	57%	17%	100%	0%	0%	0%	0%
MA NF Total	51%	100%	0%	4%	3%	0%	0%
MA NF LOS 0-90	46%	100%	0%	17%	21%	0%	1%
MA NF LOS 91+	52%	100%	0%	2%	1%	0%	0%
EW-Residential	35%	33%	0%	100%	24%	0%	0%
EW-Community	12%	20%	0%	8%	100%	0%	2%
Alternative Care	18%	21%	29%	13%	8%	100%	3%
PCA w/o Waiver	14%	9%	0%	1%	28%	0%	100%
March 2020							
Non-MA NF Total	59%	8%	100%	0%	0%	1%	0%
Non-MA NF LOS 0-90	49%	8%	100%	2%	1%	3%	0%
Non-MA NF LOS 91+	63%	8%	100%	0%	0%	0%	0%
MA NF Total	56%	100%	0%	4%	3%	0%	0%
MA NF LOS 0-90	51%	100%	0%	18%	25%	0%	2%
MA NF LOS 91+	58%	100%	0%	2%	1%	0%	0%
EW-Residential	39%	30%	0%	100%	23%	0%	0%
EW-Community	14%	18%	0%	7%	100%	0%	2%
Alternative Care	19%	16%	26%	11%	7%	100%	2%
PCA w/o Waiver	15%	8%	0%	1%	26%	0%	100%

Figure 51. Transitions to Other LTSS Categories in the Next 24 Months for Non-Medicaid Nursing Facility Residents in March 2018

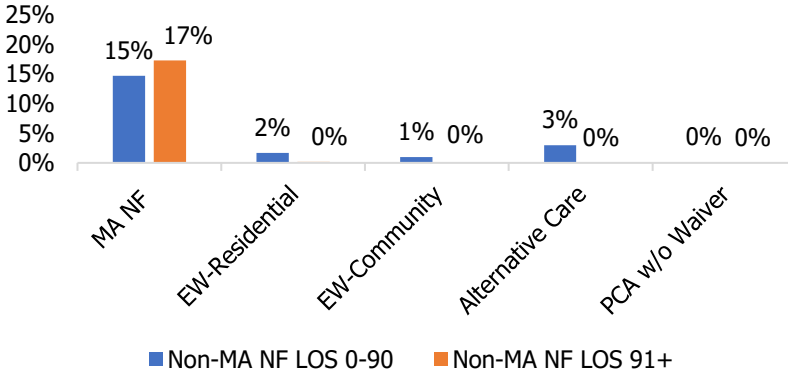


Figure 52. Transitions to Other LTSS Categories in the Next 24 Months for Non-Medicaid Nursing Facility Residents in March 2020

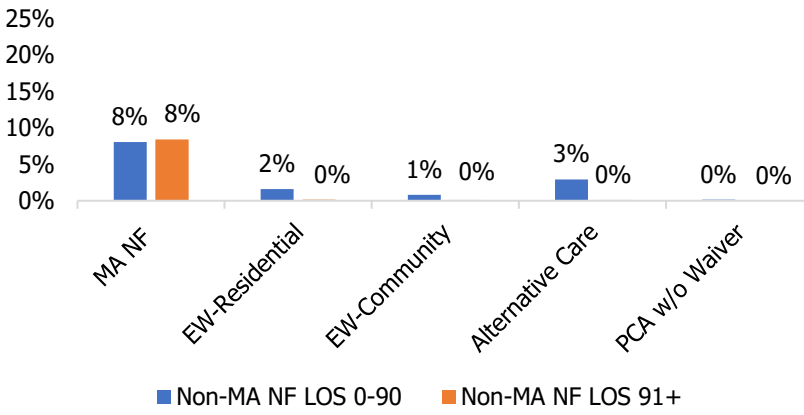
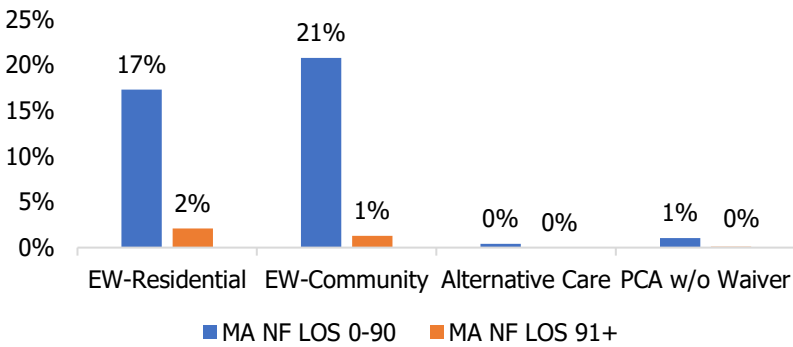


Figure 53. Transitions to Other LTSS Categories in the Next 24 Months for Medicaid Nursing Facility Residents in March 2018



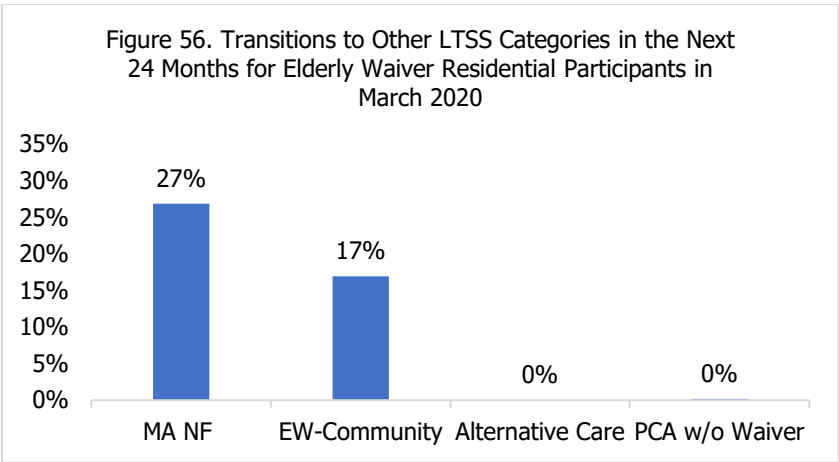
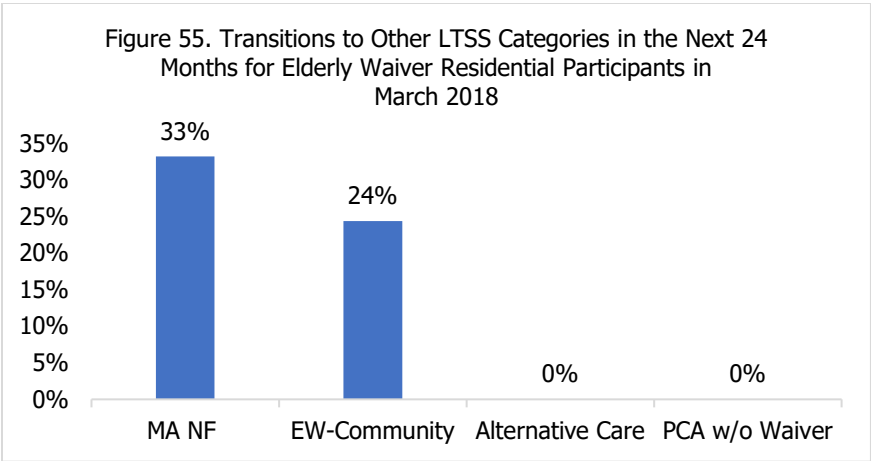
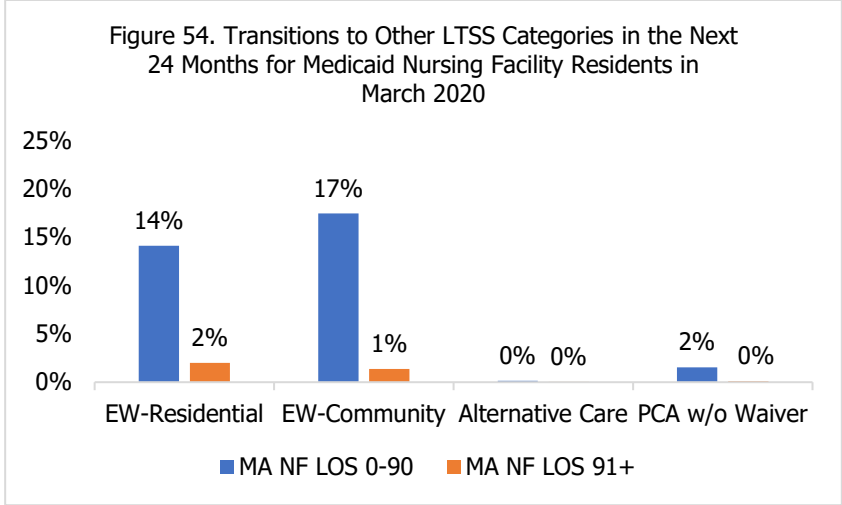


Figure 57. Transitions to Other LTSS Categories in the Next 24 Months for Elderly Waiver Community Participants in March 2018

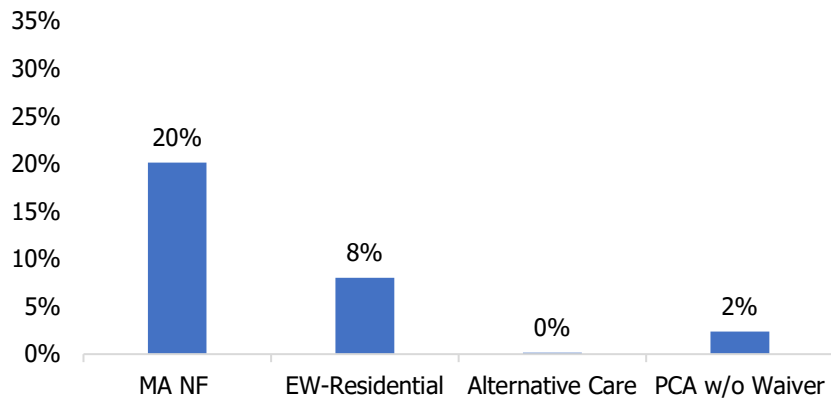


Figure 58. Transitions to Other LTSS Categories in the Next 24 Months for Elderly Waiver Community Participants in March 2020

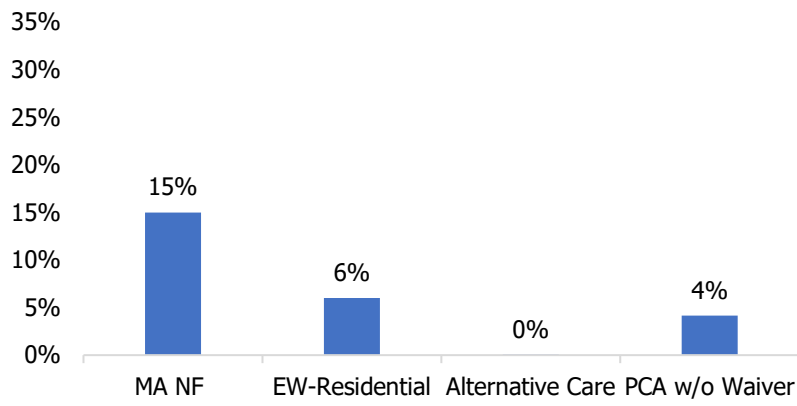


Figure 59. Transitions to Other LTSS Categories in the Next 24 Months for Alternative Care Waiver Participants in March 2018

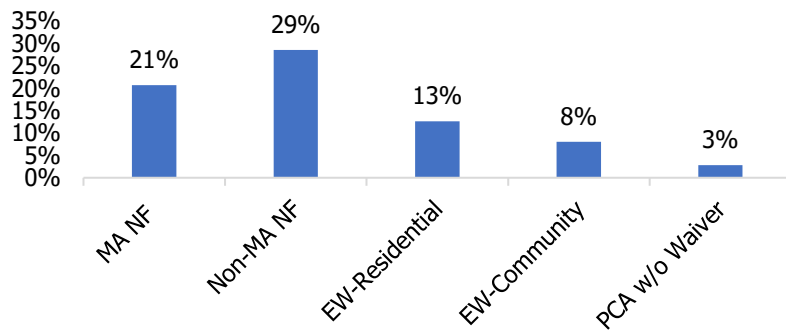


Figure 60. Transitions to Other LTSS Categories in the Next 24 Months for Alternative Care Waiver Participants in March 2020

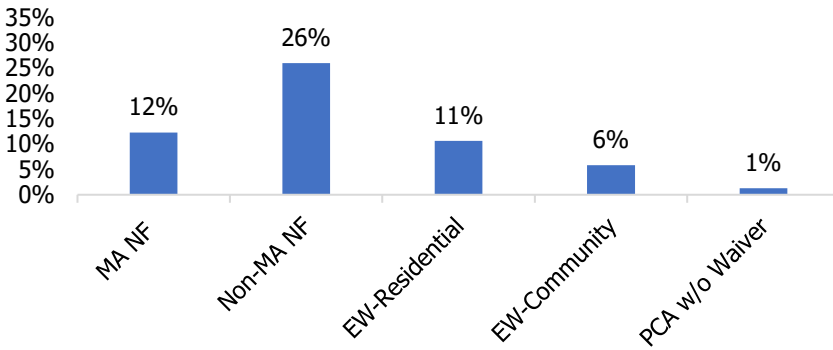


Figure 61. Transitions to Other LTSS Categories in the Next 24 Months for PCA w/o Waiver Participants in March 2018

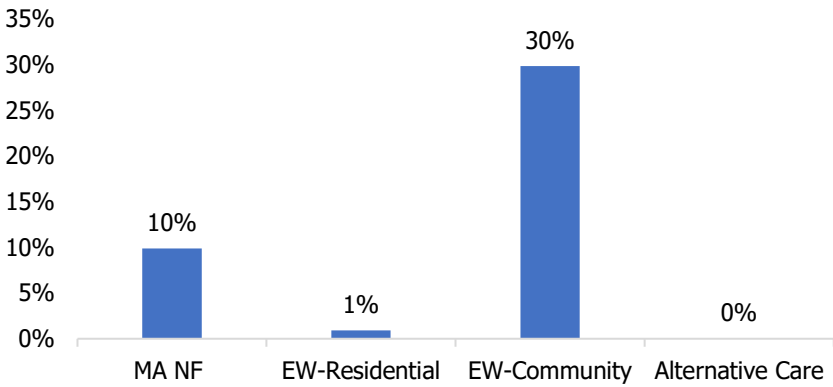
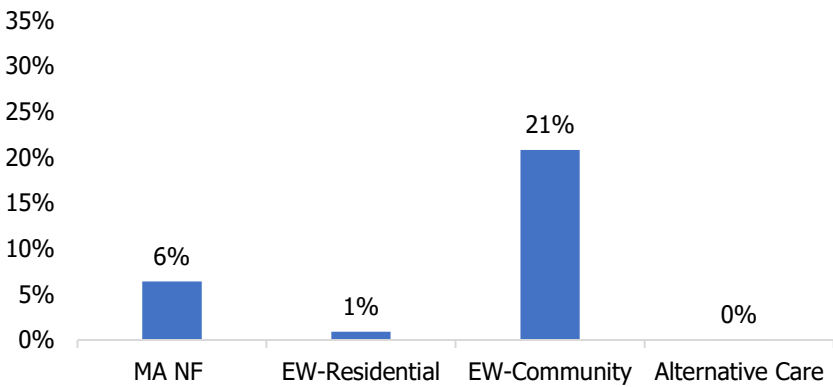


Figure 62. Transitions to Other LTSS Categories in the Next 24 Months for PCA w/o Waiver Participants in March 2020



Appendix – Chapter 5 - Baseline Projections

Report: Long-Term Services and Supports for Minnesota’s Older Population: Current and Future Utilization and Payments

November 2023

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Appendix – Chapter 5 - Baseline Projections

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

Data Sources and Major Variables

Minnesota’s Medicaid Management Information System (MMIS) and nursing facility Minimum Data Set (MDS) resident assessments are the primary sources of information about the LTSS population.

Use and Payments for the following LTSS Services are included in these projections.

- Nursing facilities (Medicaid enrollees and privately paying)
- Assisted living (Customized Living)
- Home and Community Services (HCBS) – adult day services, chore, home meals, homemaker, and Consumer-Directed Community Supports
- Personal Care Assistant (with or without an Elderly Waiver)
- Home Health and Skilled Nursing
- Hospice

Service category definitions can be found in the [Minnesota DHS Provider Manual](#):

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.

Details of the population projections and data downloads are available at the [Minnesota State Demographic Center](#):

Projection Methods

The projections involved several steps.

1. Determine the number of LTSS users and Medicaid payments for these services for each of the LTSS categories (above) by age group: 65-74, 75-84, 85 and older. For the baseline period we calculated means for number of users and annual Medicaid payments for the years 2016-2019 for each LTSS category and each age group. These figures are shown in Table 5A.1.
2. Estimate the rate of use of LTSS services per 1000 older people in the Minnesota population. Population totals for ages 65-74, 75-84, and 85 and older for the general population in 2019 were employed in estimating the base case rates of LTSS use. Table 5A.2 shows the population figures and the rates of LTSS use.
3. Make annual projections for the total Minnesota population from 2023-2035 relying on data from the State Demographic Center. Because the state population projections were in 5-year intervals (2020, 2025, 2030, 2035) we applied a cubic spline smoothing algorithm to interpolate between years for which projections were made. Figure 5A.1 shows annual population projections. These projections reflect an age cohort effect where the number of people in the 75-84 age range is rapidly increasing as baby boomers move into that age range. In contrast, the 65-74 age range is declining due to fewer members in the post-baby boom age cohorts. The number in the 85 and older age range is increasing but at a less rapid pace than the 75-84 age range. The full effect of the baby boomer cohort will not be felt until future years as they reach 85 or older.
4. Apply base case rates of LTSS utilization (#2) to the annual population projections (#3) in order to arrive at annual projections of the number of LTSS users by age category

from 2023-2035. Figure 5A.2 through Figure 5A.10 and Table 5A.5 show the projected number of people who would use each LTSS in each year by age group. The patterns in these projections follow closely the projections for the total population upon which they are based. The most rapid increases are for the 75-84 age range, followed by age 85 and older, and then age 65-74.

5. Apply figures on annual total Medicaid payments for LTSS to the projected number of users in order to project total annual Medicaid LTSS payments from 2023-2035. Table 5A.7 show projected annual total Medicaid payments by LTSS service category and age group in 2018 dollars. Figure 5A.11 to Figure 5A.19 and Table 5A.8 show payments inflated at 2.5% annually.
6. Estimate the rates of nursing facility utilization and private payments for older people not enrolled in Medicaid. Since we have complete information on all nursing facility utilization (Medicaid and non-Medicaid), we were able to project the number of nursing facility users not enrolled in Medicaid (Figure 5A.3 and Table 5A.3). Since Minnesota requires that non-Medicaid payment rates for nursing facility care be set equal to the Medicaid rate, we were able to apply the Medicaid payment rate to estimate private payments.

Table 5A.1 Baseline Annual Rates of LTSS Use per 1000 People in Minnesota in 2019

LTSS Service	65-74	75-84	85+	Total
Access	15.0	25.6	45.1	21.9
Case Management	10.4	20.4	53.6	18.6
Assisted Living Facility	5.6	14.4	48.8	13.5
HCBS	12.9	23.7	30.0	18.2
Home Health	10.0	18.1	30.8	15.0
Personal Care Assistant	9.6	13.8	16.2	11.7
Hospice	3.2	5.2	23.8	6.3
Medicaid Nursing Facility Care	7.1	21.6	78.7	20.2
Non-Medicaid Nursing Facility Care	3.5	15.3	69.6	15.1

*Total is a weighted average of the other three columns based on age group sizes.

Table 5A.2 Mean Annual Baseline Payments per User of LTSS

LTSS Service	65-74	75-84	85+	Total
Access	\$795	\$761	\$379	\$640
Case Management	\$1,593	\$1,578	\$1,256	\$1,427
Assisted Living Facility	\$20,085	\$20,693	\$20,414	\$20,450
HCBS	\$5,634	\$5,736	\$4,867	\$5,615
Home Health	\$4,849	\$4,873	\$4,461	\$4,772
Personal Care Assistant	\$23,230	\$23,451	\$26,363	\$24,196
Hospice	\$14,594	\$14,946	\$16,760	\$15,994
Medicaid Nursing Facility Care	\$45,012	\$45,348	\$47,361	\$46,663
Non-Medicaid Nursing Facility Care	\$45,012	\$45,348	\$47,361	\$46,663

Table 5A.3 Population Projections by Age Group from Minnesota State Demographic Center

Year	65-74	75-84	85+	Total
2020	554953	263842	111244	930039
2025	628305	323878	110005	1062188
2030	654156	394169	118292	1166617
2035	604498	448268	140086	1192852
2040	542873	464926	165361	1173160
2045	546985	426911	188550	1162446
2050	604670	383225	198869	1186764
2055	630791	386519	190179	1207489
2060	628671	426434	179053	1234158
2065	617449	441279	179272	1238000
2070	614559	439993	190039	1244591
2075	641148	431553	192873	1265574

<https://mn.gov/admin/demography/data-by-topic/population-data/our-projections/>

Table 5A.4 Population Projections by Age Group 2023-2035 with Interpolation between Years

Year	65-74	75-84	85+	Total
2020	554953	263842	111244	930039
2021	571123	275189	110680	956991
2022	586916	286699	110194	983810
2023	601960	298540	109867	1010368
2024	615880	310878	109778	1036536
2025	628305	323878	110005	1062188
2026	638854	337623	110625	1087102
2027	647124	351861	111702	1110687
2028	652704	366255	113298	1132258
2029	655185	380470	115474	1151129
2030	654156	394169	118292	1166617
2031	649387	407057	121780	1178224
2032	641368	419002	125837	1186208
2033	630767	429913	130330	1191010
2034	618254	439699	135124	1193077
2035	604498	448268	140086	1192852

Interpolation for years not divisible by 5 are based on cubic smoothing spline

LTSS Service Use Projections by Age Group and Year

The projections for number of LTSS users by type of LTSS are shown in the following graphs and tables.

- Use of nursing facilities by people age 75-84 and 85 and older is projected to steadily increase over the period in total for both Medicaid enrollees and those not enrolled in Medicaid (Figure 5A.6-Figure 5A.7). The age 85 and older group is projected to have the highest use. Nursing facility use by people age 65-74 is projected to remain flat across the period.
- The use of assisted living facilities is projected to follow a pattern similar to nursing facilities (Figure 5A.4). However, the number of users age 75-84 is projected to surpass those age 85 and older in the latter years of the period.
- Use of a personal care assistant and other HCBS services is projected to be lowest among people age 85 and older and the number of users is projected to remain flat over the period (Figure 5A.5 and Figure 5A.6). Similarly, the number of users of these services age 65-74 is projected to remain relatively flat, while the number of users age 75-84 is projected to steadily increase.
- Use of access and case management services among people age 75-84 is projected to steadily increase, while use of these services among people age 65-74 and 85 and older is projected to remain flat (Figure 5A.7 and Figure 5A.8).
- Use of home health is projected to be lowest while use of hospice is projected to be highest among people age 85 and older (Figure 5A.9 and Figure 5A.10). There are

projected upward trends in use of these services by people age 75-84 and downward trends among people age 65-74.

Figure 5A.1 Total Using Any Medicaid LTSS During the Year by Age

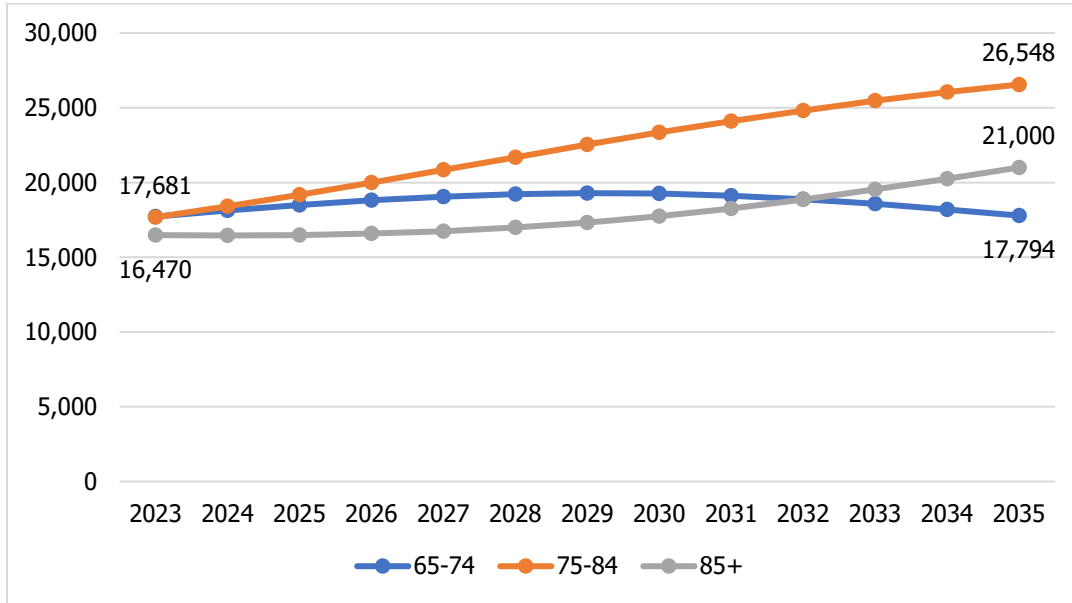


Figure 5A.2 Projected Annual Medicaid Residents of Nursing Facilities

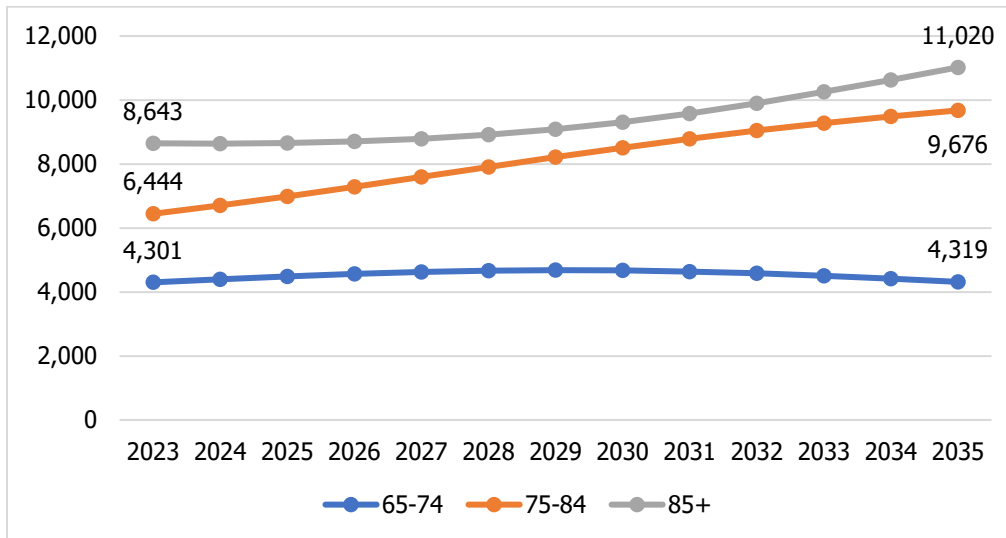


Figure 5A.3 Projected Annual Non-Medicaid Residents of Nursing Facilities

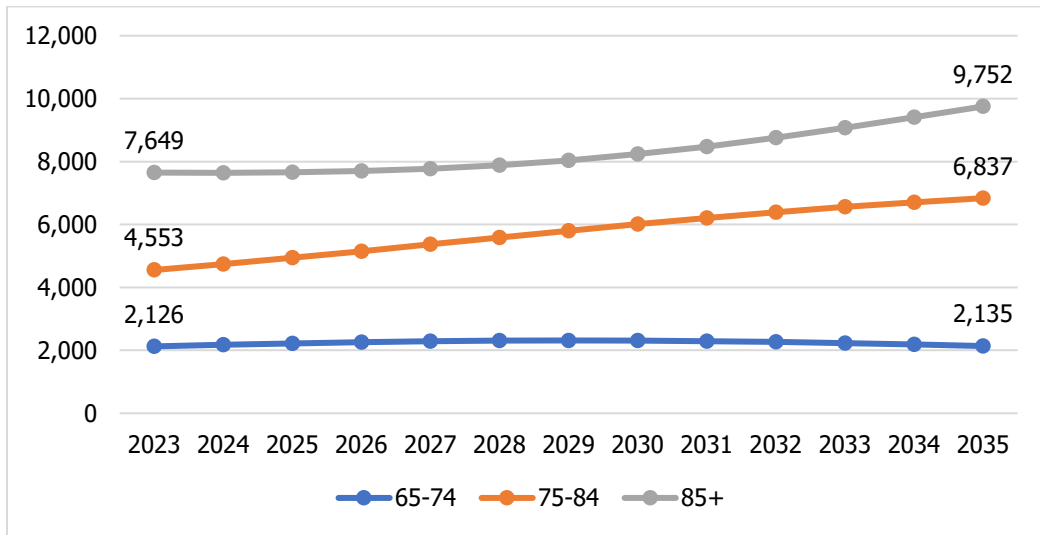


Figure 5A.4 Projected Annual Medicaid Residents of Assisted Living Facilities

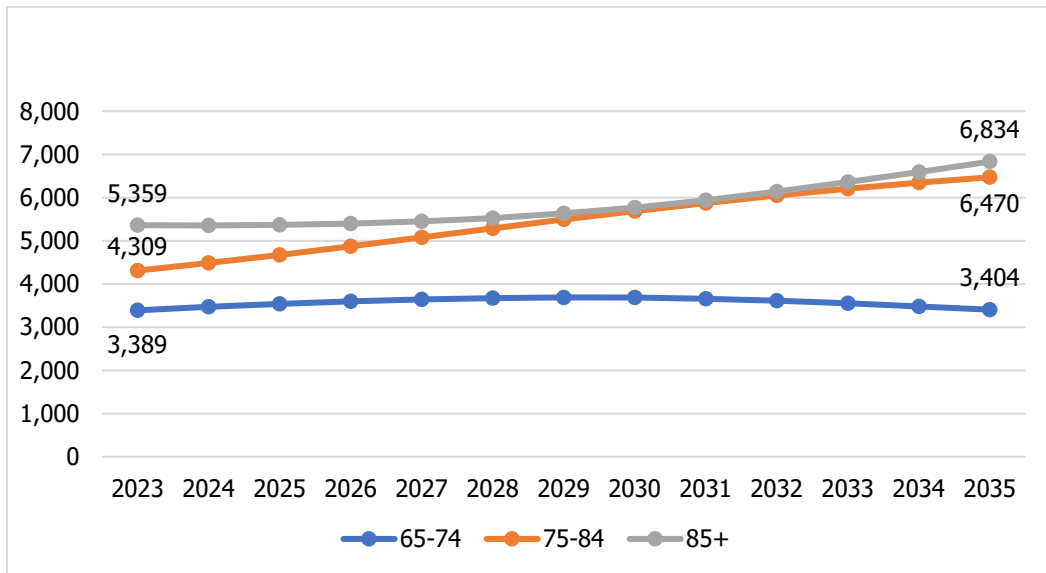


Figure 5A.5 Projected Annual Medicaid Users of HCBS

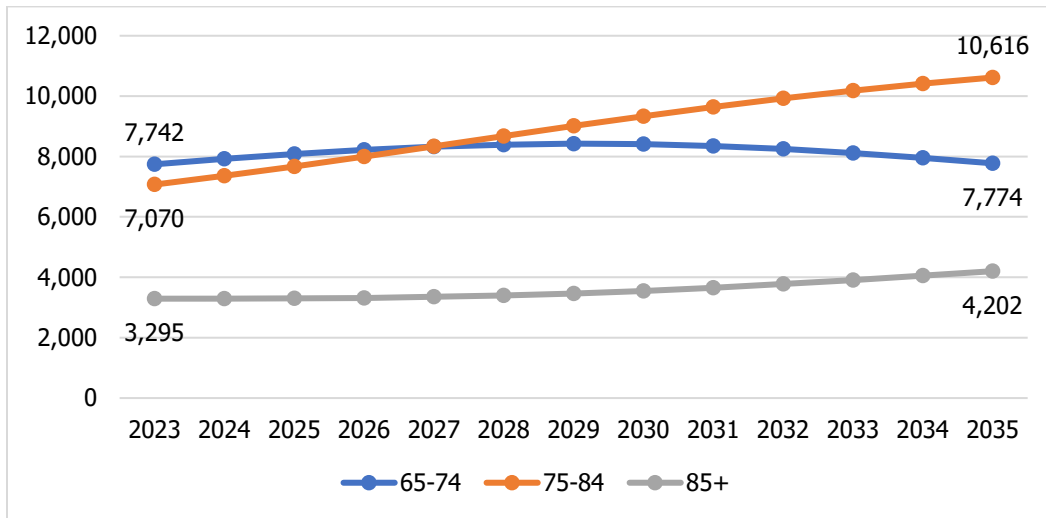


Figure 5A.6 Projected Annual Medicaid Users of a Personal Care Assistant

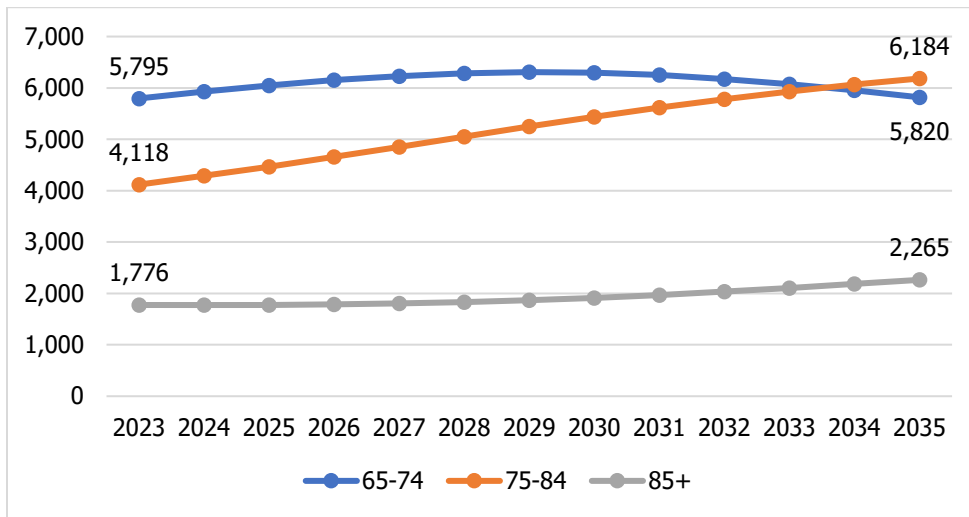


Figure 5A.7 Projected Annual Medicaid Users of Access Services

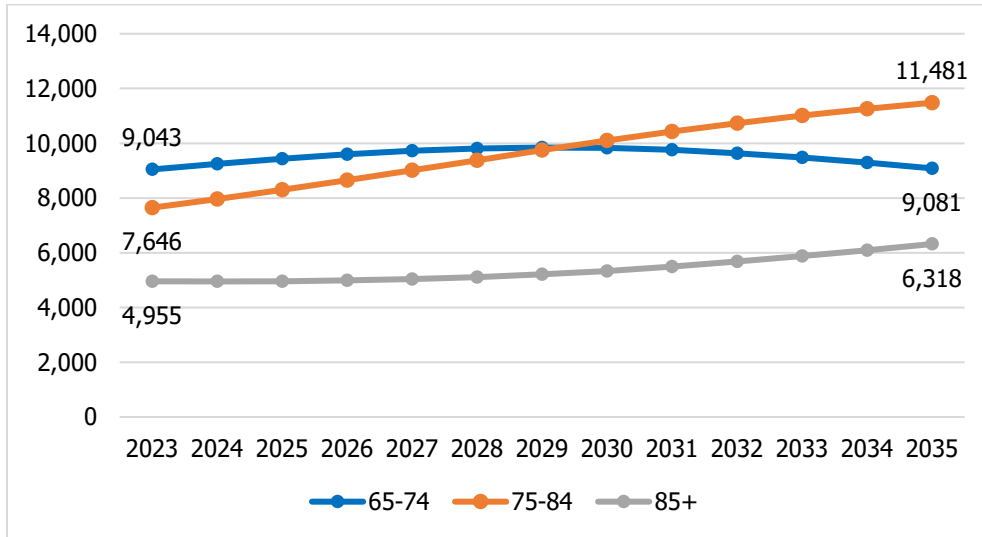


Figure 5A.8 Projected Annual Medicaid Users of Case Management

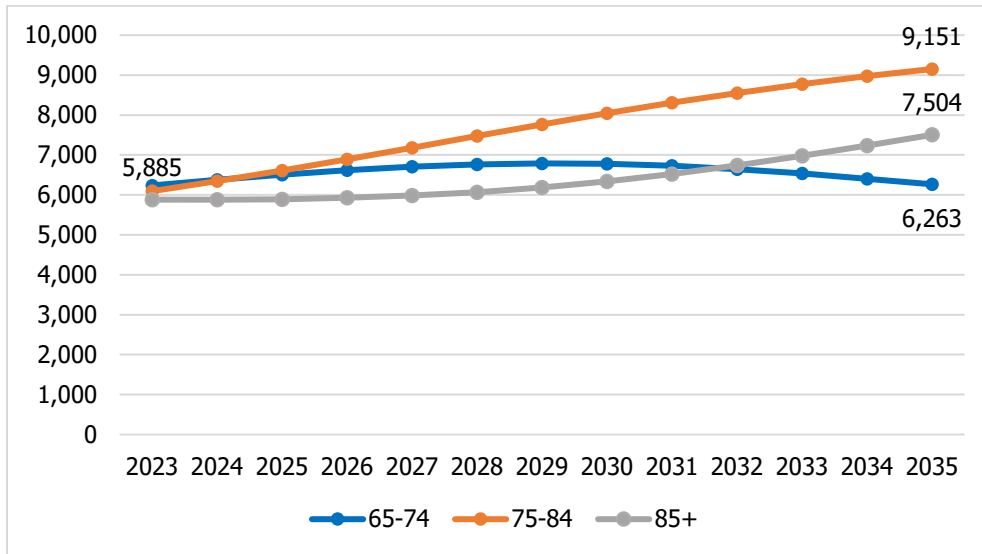


Figure 5A.9 Projected Annual Medicaid Users of Home Health

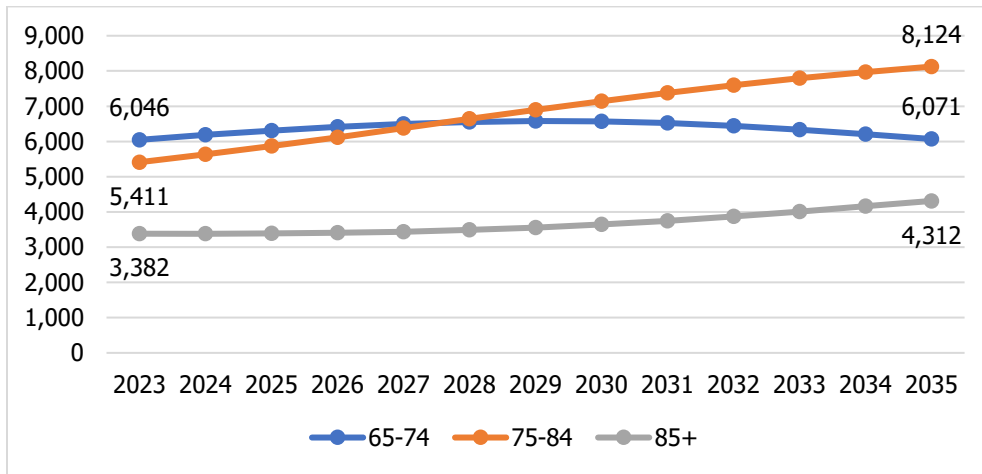


Figure 5A.10 Projected Annual Medicaid Users of Hospice Care

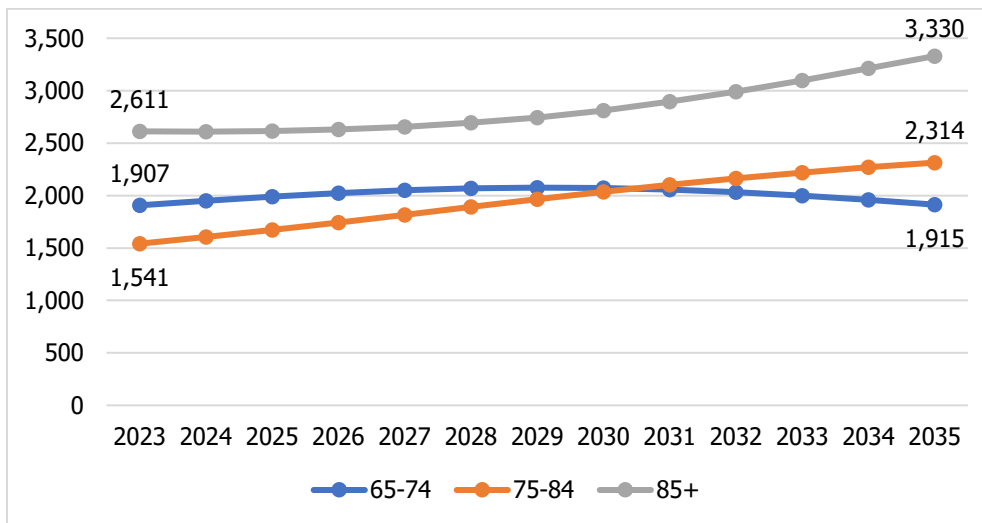


Table 5A.5 Projected Number of Persons Using LTSS Annually from 2023-2035 by Age Category

Access Services				
Year	65-74	75-84	85+	Total
2023	9043	7646	4955	21644
2024	9252	7962	4951	22165
2025	9438	8295	4962	22695
2026	9597	8647	4990	23234
2027	9721	9012	5038	23771
2028	9805	9380	5110	24296
2029	9842	9745	5208	24795
2030	9827	10095	5335	25258
2031	9755	10426	5493	25673
2032	9635	10731	5676	26042
2033	9475	11011	5878	26365
2034	9287	11262	6095	26644
2035	9081	11481	6318	26880

Case Management				
Year	65-74	75-84	85+	Total
2023	6237	6094	5885	18217
2024	6381	6346	5881	18608
2025	6510	6612	5893	19014
2026	6619	6892	5926	19438
2027	6705	7183	5984	19872
2028	6763	7477	6069	20309
2029	6789	7767	6186	20741
2030	6778	8046	6337	21161
2031	6729	8310	6523	21562
2032	6646	8553	6741	21940
2033	6536	8776	6981	22293
2034	6406	8976	7238	22620
2035	6263	9151	7504	22918

Assisted Living

Year	65-74	75-84	85+	Total
2023	3389	4309	5359	13058
2024	3468	4487	5355	13310
2025	3538	4675	5366	13579
2026	3597	4873	5396	13867
2027	3644	5079	5449	14171
2028	3675	5287	5527	14489
2029	3689	5492	5633	14814
2030	3683	5689	5770	15143
2031	3656	5876	5941	15473
2032	3611	6048	6139	15798
2033	3552	6205	6358	16115
2034	3481	6347	6592	16419
2035	3404	6470	6834	16708

HCBS

Year	65-74	75-84	85+	Total
2023	7742	7070	3295	18108
2024	7921	7362	3293	18576
2025	8081	7670	3300	19051
2026	8216	7996	3318	19530
2027	8323	8333	3351	20006
2028	8394	8674	3398	20467
2029	8426	9011	3464	20901
2030	8413	9335	3548	21296
2031	8352	9640	3653	21645
2032	8249	9923	3774	21946
2033	8112	10182	3909	22203
2034	7951	10413	4053	22418
2035	7774	10616	4202	22593

Home Health

Year	65-74	75-84	85+	Total
2023	6046	5411	3382	14838
2024	6185	5634	3379	15199
2025	6310	5870	3386	15566
2026	6416	6119	3405	15940
2027	6499	6377	3438	16315
2028	6555	6638	3487	16681
2029	6580	6896	3554	17030
2030	6570	7144	3641	17355
2031	6522	7378	3748	17648
2032	6441	7594	3873	17909
2033	6335	7792	4012	18138
2034	6209	7969	4159	18338
2035	6071	8124	4312	18508

Personal Care Assistant

Year	65-74	75-84	85+	Total
2023	5795	4118	1776	11690
2024	5929	4289	1775	11993
2025	6049	4468	1778	12295
2026	6151	4658	1788	12597
2027	6230	4854	1806	12890
2028	6284	5052	1832	13168
2029	6308	5249	1867	13423
2030	6298	5438	1912	13648
2031	6252	5615	1969	13836
2032	6175	5780	2034	13989
2033	6073	5931	2107	14110
2034	5952	6066	2184	14202
2035	5820	6184	2265	14268

Hospice

Year	65-74	75-84	85+	Total
2023	1907	1541	2611	6059
2024	1951	1605	2609	6165
2025	1990	1672	2615	6277
2026	2024	1743	2629	6396
2027	2050	1816	2655	6521
2028	2068	1891	2693	6651
2029	2076	1964	2745	6784
2030	2072	2035	2812	6919
2031	2057	2101	2895	7053
2032	2032	2163	2991	7186
2033	1998	2219	3098	7315
2034	1959	2270	3212	7440
2035	1915	2314	3330	7559

**Nursing Facility
Medicaid Residents**

Year	65-74	75-84	85+	Total
2023	4301	6444	8643	19388
2024	4401	6710	8636	19747
2025	4490	6991	8654	20134
2026	4565	7287	8703	20555
2027	4624	7595	8787	21006
2028	4664	7905	8913	21482
2029	4682	8212	9084	21978
2030	4674	8508	9306	22488
2031	4640	8786	9580	23006
2032	4583	9044	9899	23526
2033	4507	9279	10253	24039
2034	4418	9491	10630	24538
2035	4319	9676	11020	25015

**Total Using any
Medicaid LTSS**

Year	65-74	75-84	85+	Total
2023	17719	17681	16470	51870
2024	18129	18411	16457	52997
2025	18495	19181	16491	54167
2026	18805	19995	16584	55385
2027	19049	20839	16745	56633
2028	19213	21691	16985	57889
2029	19286	22533	17311	59130
2030	19256	23344	17733	60333
2031	19115	24108	18256	61479
2032	18879	24815	18864	62559
2033	18567	25461	19538	63566
2034	18199	26041	20257	64496
2035	17794	26548	21000	65343

**Nursing Facility
Non-Medicaid Residents**

Year	65-74	75-84	85+	Total
2023	2126	4553	7649	14328
2024	2175	4742	7642	14559
2025	2219	4940	7658	14817
2026	2256	5150	7701	15107
2027	2286	5367	7776	15429
2028	2305	5586	7887	15779
2029	2314	5803	8039	16156
2030	2310	6012	8235	16557
2031	2294	6209	8478	16980
2032	2265	6391	8760	17416
2033	2228	6557	9073	17858
2034	2184	6707	9407	18297
2035	2135	6837	9752	18724

Table 5A.6 Annual Inflation Index from 2018 through 2035 at Annual Inflation Rate of 2.5%

Year	Index
2018	1.0000
2019	1.0250
2020	1.0506
2021	1.0769
2022	1.1038
2023	1.1314
2024	1.1597
2025	1.1887
2026	1.2184
2027	1.2489
2028	1.2801
2029	1.3121
2030	1.3449
2031	1.3785
2032	1.4130
2033	1.4483
2034	1.4845
2035	1.5216

Note: 2018 was chosen as the middle of the historical Medicaid payment period

Payment Projections

Because of increases in the older population and after applying a 2.5% annual inflation, annual Medicaid payments for LTSS (i.e., nursing facilities, assisted living facilities, and community LTSS) are projected to increase from \$1,977 million in 2023 to \$3,379 million in 2035 (Figure 5A.11, Table 5A.8).

- The largest increase in Medicaid LTSS payments is projected to be for people age 75-84 from \$660 million in 2023 to \$1,333 million in 2035 (Figure 5A.11, Table 5A.8). Payments for people 85 and older are projected to increase from \$735 million to \$1,261 over the same period. The smallest projected increase is for people age 65-74 from \$582 million to \$786 million over the period.
- Projected Medicaid nursing facility payments are the largest share of total Medicaid payments. They are projected to rise from \$1,013 million in 2023 to \$1,758 million in 2035 (Table 5A.8). Nearly half of projected Medicaid payments for nursing facility care are for people age 85 and older (Figure 5A.12, Table 5A.8).
- Assisted living facility payments were projected to rise from \$302 million in 2023 to \$520 million in 2035 (Table 5A.8). On average, assisted living residents were older than users of personal care assistants; however, they were somewhat younger than nursing facility residents (Figure 5A.13).

- Personal care assistants, with or without a waiver, were projected to rise from \$315 million in 2023 to \$517 million in 2035 (Table 5A.8). Compared to nursing facilities, these payments were concentrated among people below the age of 85 (Figure 5A.14).
- Projected payments for other HCBS services were projected to increase from \$113 million in 2023 to \$190 million in 2035 (Table 5A.8). They too were concentrated among people below the age of 85 (Figure 5A.15).
- Projected payments for other Medicaid LTSS ranged from hospice care at \$107 million in 2023 and \$180 million in 2035 to access services at \$17 million in 2023 and \$28 million in 2035 (Figure 5A.16 to Figure 5A.19, Table 5A.8).

Figure 5A.11 Projected Total Annual Medicaid Payments by Age Group (\$ Millions, 2.5% annual inflation)

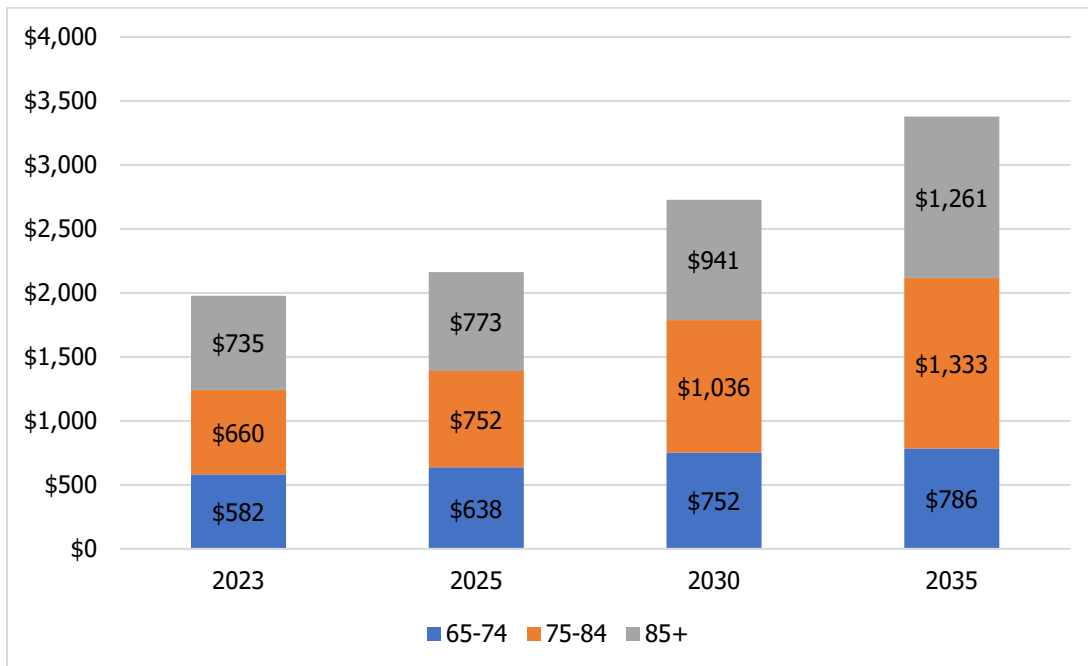


Figure 5A.12 Projected Annual Medicaid Payments for Medicaid Nursing Facilities (\$ Millions, 2.5% annual inflation)

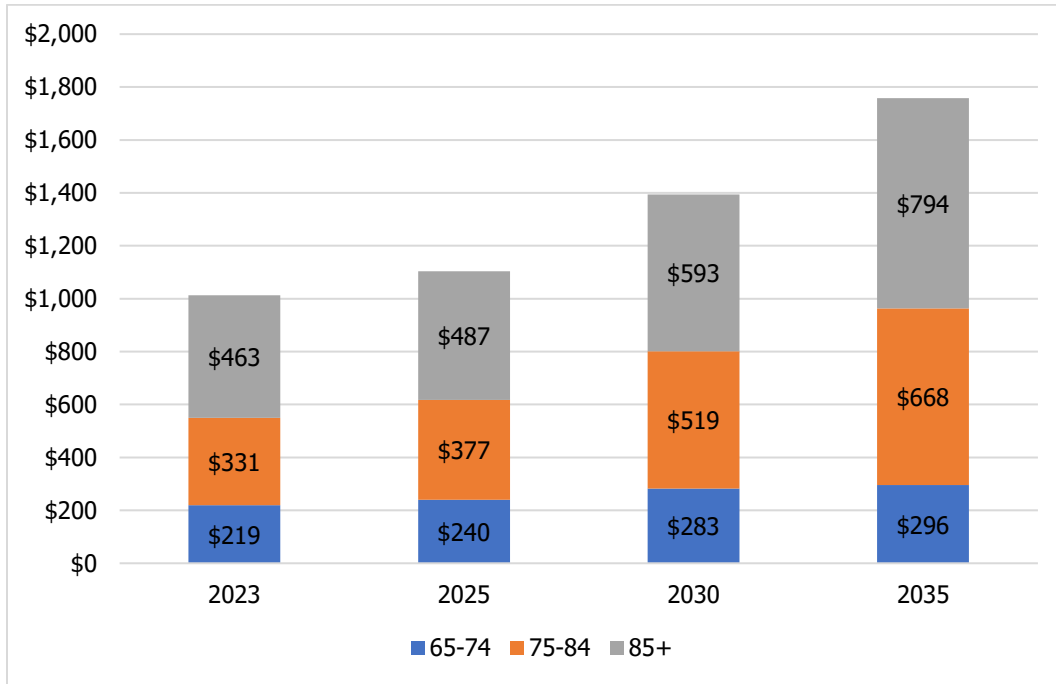


Figure 5A.13 Projected Annual Medicaid Payments for Assisted Living Facilities (\$ Millions, 2.5% annual inflation)

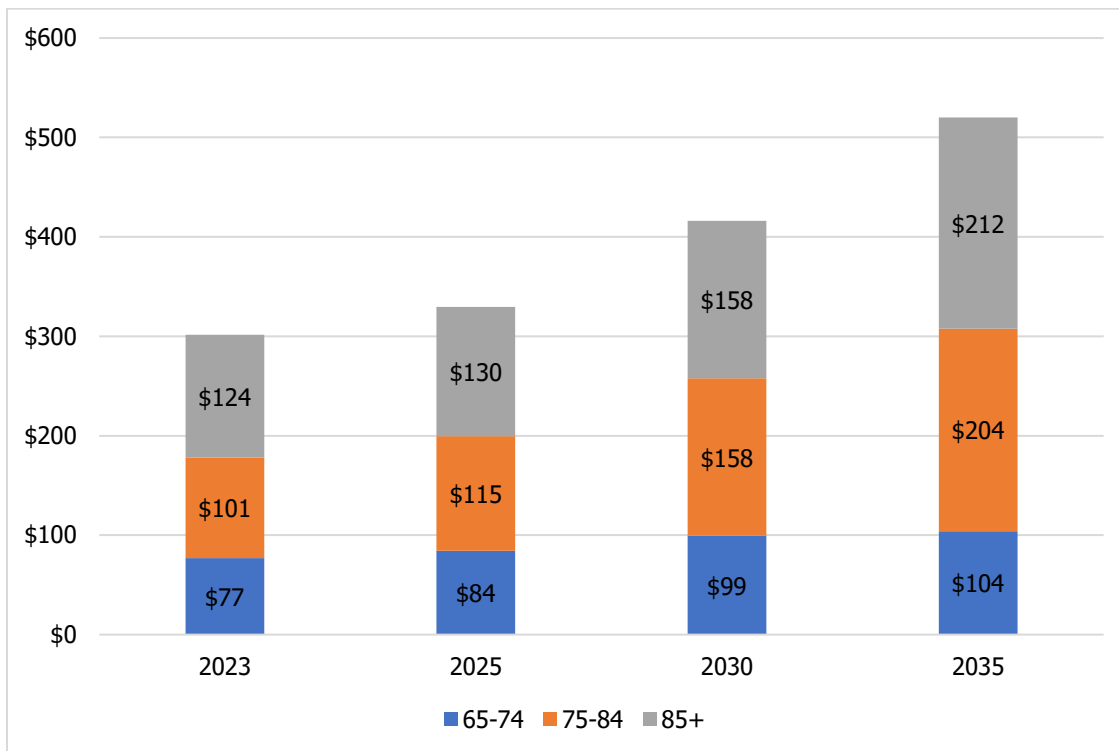


Figure 5A.14 Projected Annual Medicaid Payments for Personal Care Assistants (\$ Millions, 2.5% annual inflation)

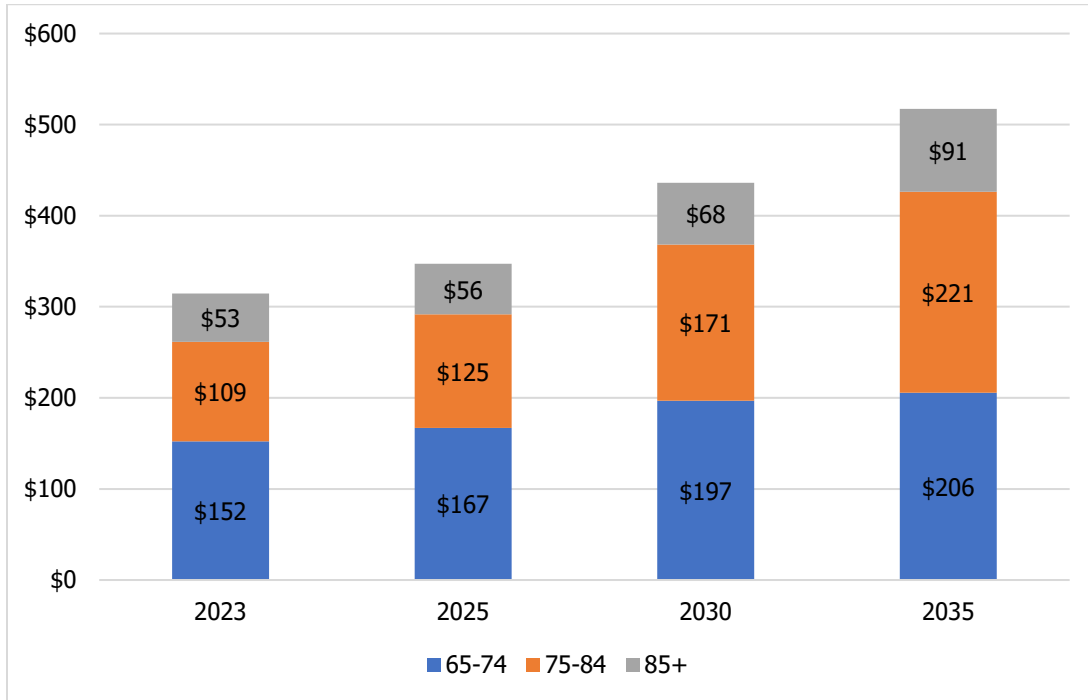


Figure 5A.15 Projected Annual Medicaid Payments for HCBS Services (\$ Millions, 2.5% annual inflation)

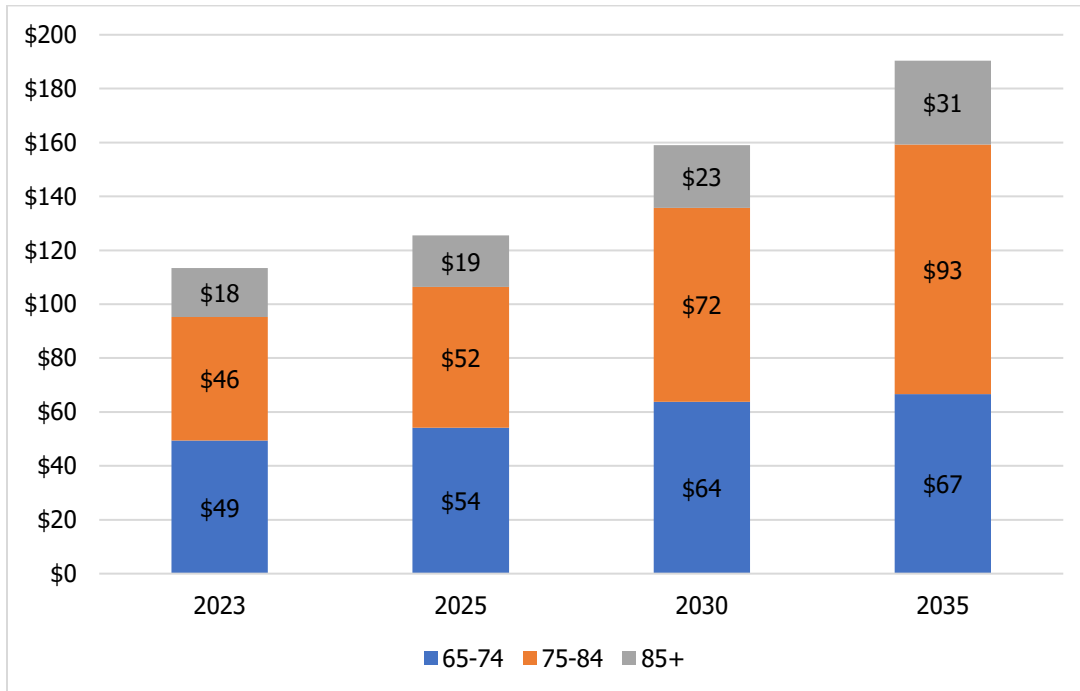


Figure 5A.16 Projected Annual Medicaid Payments for Access Services (\$ Millions, 2.5% annual inflation)

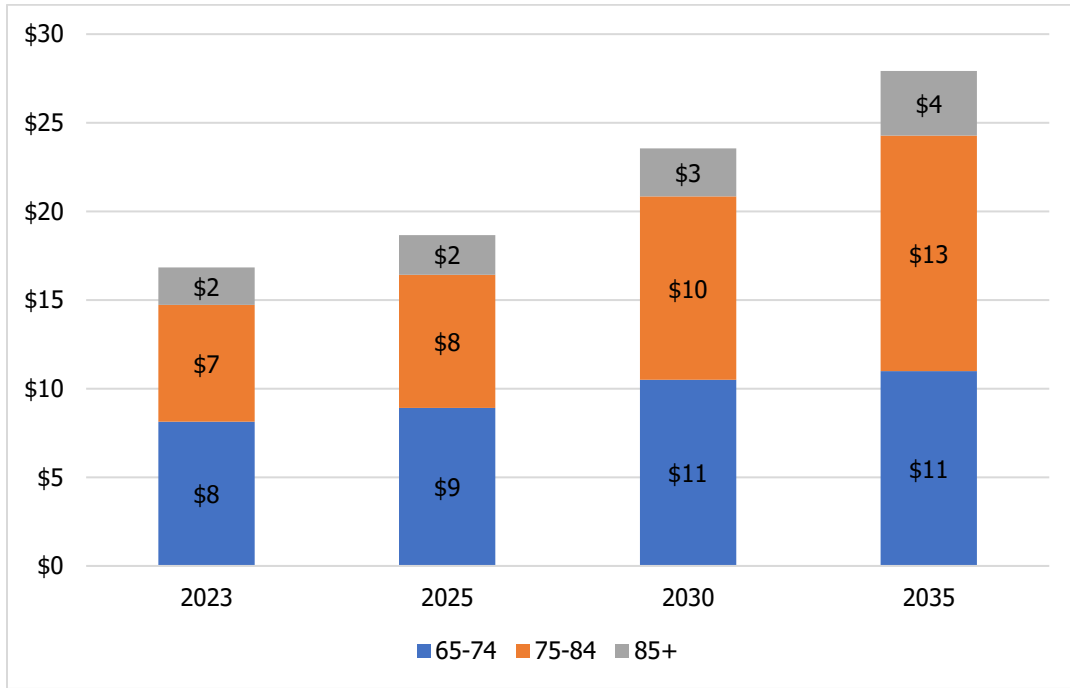


Figure 5A.17 Projected Annual Medicaid Payments for Case Management (\$ Millions, 2.5% annual inflation)

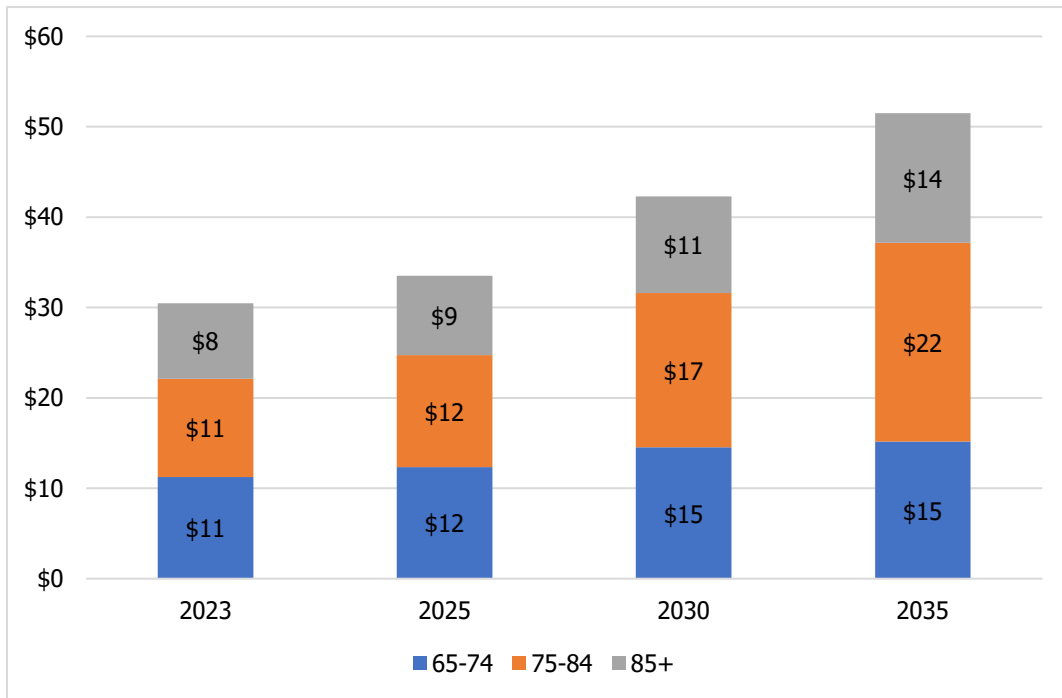


Figure 5A.18 Projected Annual Medicaid Payments for Home Health Services (\$ Millions, 2.5% annual inflation)

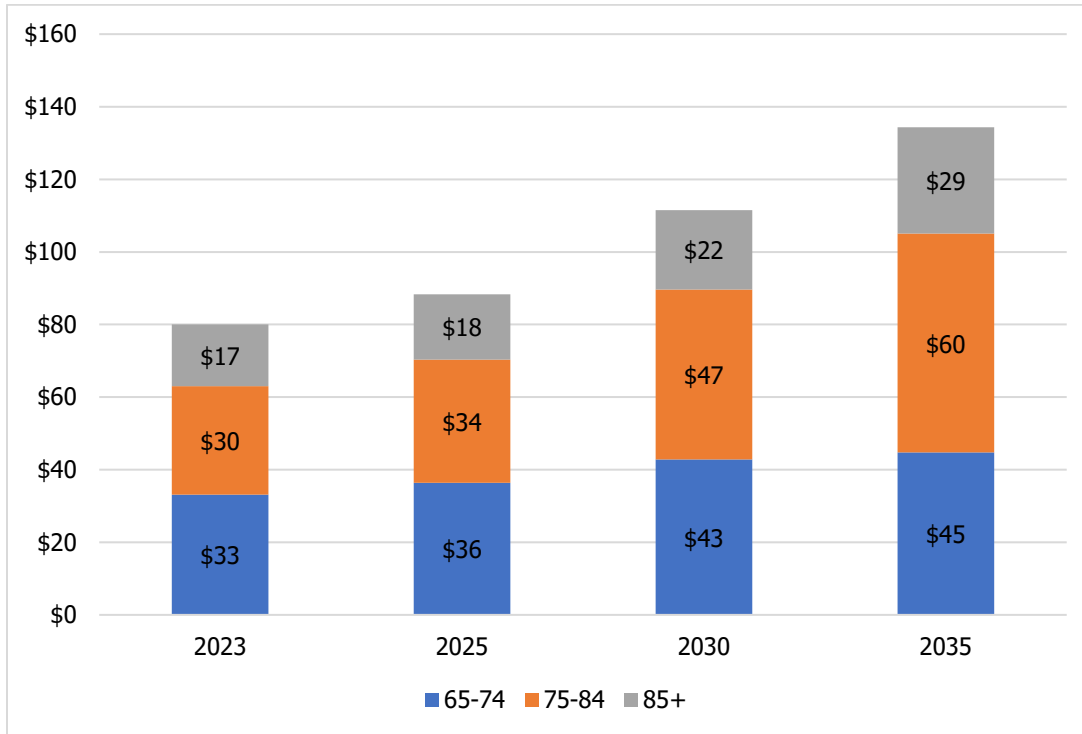


Figure 5A.19 Projected Annual Medicaid Payments for Hospice Services (\$ Millions, 2.5% annual inflation)

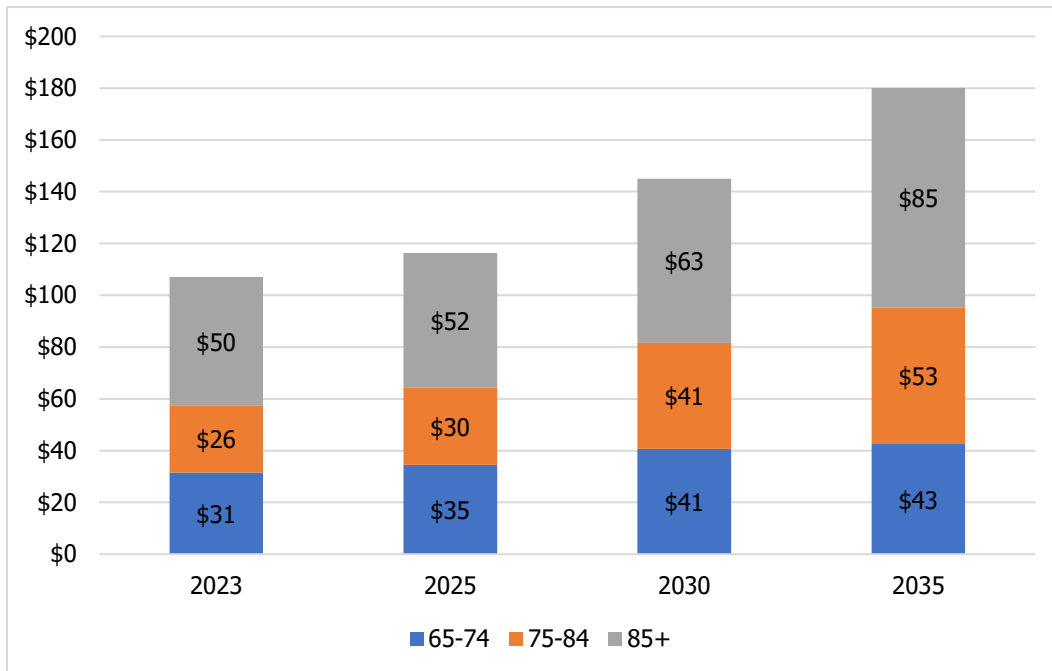


Table 5A.7 Projected Medicaid LTSS Expenditures by LTSS Type 2022-2035 in Un-Inflated 2018 Dollars (\$Millions)

Medicaid Nursing Facility				
Year	65-74	75-84	85+	Total
2023	\$193.6	\$292.2	\$409.3	\$895.2
2024	\$198.1	\$304.3	\$409.0	\$911.4
2025	\$202.1	\$317.0	\$409.9	\$928.9
2026	\$205.5	\$330.5	\$412.2	\$948.1
2027	\$208.1	\$344.4	\$416.2	\$968.7
2028	\$209.9	\$358.5	\$422.1	\$990.5
2029	\$210.7	\$372.4	\$430.2	\$1,013.4
2030	\$210.4	\$385.8	\$440.7	\$1,036.9
2031	\$208.9	\$398.4	\$453.7	\$1,061.0
2032	\$206.3	\$410.1	\$468.8	\$1,085.2
2033	\$202.9	\$420.8	\$485.6	\$1,109.3
2034	\$198.8	\$430.4	\$503.4	\$1,132.7
2035	\$194.4	\$438.8	\$521.9	\$1,155.1

Assisted Living				
Year	65-74	75-84	85+	Total
2023	\$68.1	\$89.2	\$109.4	\$266.7
2024	\$69.7	\$92.9	\$109.3	\$271.8
2025	\$71.1	\$96.7	\$109.5	\$277.3
2026	\$72.2	\$100.8	\$110.2	\$283.3
2027	\$73.2	\$105.1	\$111.2	\$289.5
2028	\$73.8	\$109.4	\$112.8	\$296.0
2029	\$74.1	\$113.6	\$115.0	\$302.7
2030	\$74.0	\$117.7	\$117.8	\$309.5
2031	\$73.4	\$121.6	\$121.3	\$316.3
2032	\$72.5	\$125.1	\$125.3	\$323.0
2033	\$71.3	\$128.4	\$129.8	\$329.5
2034	\$69.9	\$131.3	\$134.6	\$335.8
2035	\$68.4	\$133.9	\$139.5	\$341.8

HCBS

Year	65-74	75-84	85+	Total
2023	\$43.6	\$40.6	\$16.0	\$100.2
2024	\$44.6	\$42.2	\$16.0	\$102.9
2025	\$45.5	\$44.0	\$16.1	\$105.6
2026	\$46.3	\$45.9	\$16.1	\$108.3
2027	\$46.9	\$47.8	\$16.3	\$111.0
2028	\$47.3	\$49.8	\$16.5	\$113.6
2029	\$47.5	\$51.7	\$16.9	\$116.0
2030	\$47.4	\$53.5	\$17.3	\$118.2
2031	\$47.1	\$55.3	\$17.8	\$120.1
2032	\$46.5	\$56.9	\$18.4	\$121.8
2033	\$45.7	\$58.4	\$19.0	\$123.1
2034	\$44.8	\$59.7	\$19.7	\$124.3
2035	\$43.8	\$60.9	\$20.4	\$125.1

Personal Care Assistant

Year	65-74	75-84	85+	Total
2023	\$134.6	\$96.6	\$46.8	\$278.0
2024	\$137.7	\$100.6	\$46.8	\$285.1
2025	\$140.5	\$104.8	\$46.9	\$292.2
2026	\$142.9	\$109.2	\$47.1	\$299.3
2027	\$144.7	\$113.8	\$47.6	\$306.2
2028	\$146.0	\$118.5	\$48.3	\$312.7
2029	\$146.5	\$123.1	\$49.2	\$318.8
2030	\$146.3	\$127.5	\$50.4	\$324.2
2031	\$145.2	\$131.7	\$51.9	\$328.8
2032	\$143.4	\$135.5	\$53.6	\$332.6
2033	\$141.1	\$139.1	\$55.5	\$335.7
2034	\$138.3	\$142.2	\$57.6	\$338.1
2035	\$135.2	\$145.0	\$59.7	\$339.9

Access Services

Year	65-74	75-84	85+	Total
2023	\$7.2	\$5.8	\$1.9	\$14.9
2024	\$7.4	\$6.1	\$1.9	\$15.3
2025	\$7.5	\$6.3	\$1.9	\$15.7
2026	\$7.6	\$6.6	\$1.9	\$16.1
2027	\$7.7	\$6.9	\$1.9	\$16.5
2028	\$7.8	\$7.1	\$1.9	\$16.9
2029	\$7.8	\$7.4	\$2.0	\$17.2
2030	\$7.8	\$7.7	\$2.0	\$17.5
2031	\$7.8	\$7.9	\$2.1	\$17.8
2032	\$7.7	\$8.2	\$2.2	\$18.0
2033	\$7.5	\$8.4	\$2.2	\$18.1
2034	\$7.4	\$8.6	\$2.3	\$18.3
2035	\$7.2	\$8.7	\$2.4	\$18.4

Case Management

Year	65-74	75-84	85+	Total
2023	\$9.9	\$9.6	\$7.4	\$26.9
2024	\$10.2	\$10.0	\$7.4	\$27.6
2025	\$10.4	\$10.4	\$7.4	\$28.2
2026	\$10.5	\$10.9	\$7.4	\$28.9
2027	\$10.7	\$11.3	\$7.5	\$29.5
2028	\$10.8	\$11.8	\$7.6	\$30.2
2029	\$10.8	\$12.3	\$7.8	\$30.8
2030	\$10.8	\$12.7	\$8.0	\$31.5
2031	\$10.7	\$13.1	\$8.2	\$32.0
2032	\$10.6	\$13.5	\$8.5	\$32.5
2033	\$10.4	\$13.8	\$8.8	\$33.0
2034	\$10.2	\$14.2	\$9.1	\$33.5
2035	\$10.0	\$14.4	\$9.4	\$33.8

Home Health

Year	65-74	75-84	85+	Total
2023	\$29.3	\$26.4	\$15.1	\$70.8
2024	\$30.0	\$27.5	\$15.1	\$72.5
2025	\$30.6	\$28.6	\$15.1	\$74.3
2026	\$31.1	\$29.8	\$15.2	\$76.1
2027	\$31.5	\$31.1	\$15.3	\$77.9
2028	\$31.8	\$32.3	\$15.6	\$79.7
2029	\$31.9	\$33.6	\$15.9	\$81.4
2030	\$31.9	\$34.8	\$16.2	\$82.9
2031	\$31.6	\$35.9	\$16.7	\$84.3
2032	\$31.2	\$37.0	\$17.3	\$85.5
2033	\$30.7	\$38.0	\$17.9	\$86.6
2034	\$30.1	\$38.8	\$18.6	\$87.5
2035	\$29.4	\$39.6	\$19.2	\$88.3

Hospice

Year	65-74	75-84	85+	Total
2023	\$27.8	\$23.0	\$43.8	\$94.6
2024	\$28.5	\$24.0	\$43.7	\$96.2
2025	\$29.0	\$25.0	\$43.8	\$97.9
2026	\$29.5	\$26.0	\$44.1	\$99.7
2027	\$29.9	\$27.1	\$44.5	\$101.6
2028	\$30.2	\$28.3	\$45.1	\$103.6
2029	\$30.3	\$29.4	\$46.0	\$105.6
2030	\$30.2	\$30.4	\$47.1	\$107.8
2031	\$30.0	\$31.4	\$48.5	\$109.9
2032	\$29.7	\$32.3	\$50.1	\$112.1
2033	\$29.2	\$33.2	\$51.9	\$114.2
2034	\$28.6	\$33.9	\$53.8	\$116.3
2035	\$27.9	\$34.6	\$55.8	\$118.3

Total Medicaid LTSS

Year	65-74	75-84	85+	Total
2023	\$514.2	\$583.4	\$649.7	\$1,747.3
2024	\$526.1	\$607.5	\$649.2	\$1,782.8
2025	\$536.7	\$632.9	\$650.5	\$1,820.1
2026	\$545.7	\$659.7	\$654.2	\$1,859.7
2027	\$552.8	\$687.5	\$660.6	\$1,900.9
2028	\$557.5	\$715.7	\$670.0	\$1,943.2
2029	\$559.7	\$743.4	\$682.9	\$1,986.0
2030	\$558.8	\$770.2	\$699.6	\$2,028.6
2031	\$554.7	\$795.4	\$720.2	\$2,070.3
2032	\$547.9	\$818.7	\$744.2	\$2,110.8
2033	\$538.8	\$840.1	\$770.7	\$2,149.6
2034	\$528.1	\$859.2	\$799.1	\$2,186.4
2035	\$516.4	\$875.9	\$828.4	\$2,220.7

Table 5A.8 Projected Medicaid LTSS Expenditures by LTSS Type 2022-2035 with an Annual Inflation Rate of 2.5% (\$Millions)

Medicaid, Nursing Facility				
Year	65-74	75-84	85+	Total
2023	\$219.1	\$330.6	\$463.1	\$1,012.8
2024	\$229.7	\$352.9	\$474.3	\$1,056.9
2025	\$240.2	\$376.8	\$487.2	\$1,104.2
2026	\$250.4	\$402.6	\$502.2	\$1,155.2
2027	\$259.9	\$430.1	\$519.7	\$1,209.8
2028	\$268.7	\$458.9	\$540.4	\$1,268.0
2029	\$276.5	\$488.6	\$564.5	\$1,329.6
2030	\$283.0	\$518.9	\$592.7	\$1,394.6
2031	\$287.9	\$549.2	\$625.5	\$1,462.6
2032	\$291.5	\$579.5	\$662.5	\$1,533.4
2033	\$293.8	\$609.4	\$703.3	\$1,606.5
2034	\$295.2	\$638.9	\$747.4	\$1,681.5
2035	\$295.8	\$667.6	\$794.2	\$1,757.7

Medicaid Assisted Living Facility				
Year	65-74	75-84	85+	Total
2023	\$77.0	\$100.9	\$123.8	\$301.7
2024	\$80.8	\$107.7	\$126.8	\$315.2
2025	\$84.5	\$115.0	\$130.2	\$329.7
2026	\$88.0	\$122.9	\$134.2	\$345.1
2027	\$91.4	\$131.3	\$138.9	\$361.6
2028	\$94.5	\$140.0	\$144.4	\$379.0
2029	\$97.2	\$149.1	\$150.9	\$397.2
2030	\$99.5	\$158.3	\$158.4	\$416.3
2031	\$101.2	\$167.6	\$167.2	\$436.0
2032	\$102.5	\$176.8	\$177.1	\$456.4
2033	\$103.3	\$186.0	\$188.0	\$477.3
2034	\$103.8	\$195.0	\$199.8	\$498.5
2035	\$104.0	\$203.7	\$212.3	\$520.0

HCBS

Year	65-74	75-84	85+	Total
2023	\$49.4	\$45.9	\$18.1	\$113.4
2024	\$51.8	\$49.0	\$18.6	\$119.3
2025	\$54.1	\$52.3	\$19.1	\$125.5
2026	\$56.4	\$55.9	\$19.7	\$132.0
2027	\$58.6	\$59.7	\$20.4	\$138.6
2028	\$60.5	\$63.7	\$21.2	\$145.4
2029	\$62.3	\$67.8	\$22.1	\$152.2
2030	\$63.7	\$72.0	\$23.2	\$159.0
2031	\$64.9	\$76.2	\$24.5	\$165.6
2032	\$65.7	\$80.4	\$26.0	\$172.0
2033	\$66.2	\$84.6	\$27.6	\$178.3
2034	\$66.5	\$88.7	\$29.3	\$184.5
2035	\$66.7	\$92.7	\$31.1	\$190.4

Personal Care Assistant

Year	65-74	75-84	85+	Total
2023	\$152.3	\$109.3	\$53.0	\$314.6
2024	\$159.7	\$116.6	\$54.3	\$330.6
2025	\$167.0	\$124.5	\$55.7	\$347.3
2026	\$174.1	\$133.1	\$57.4	\$364.6
2027	\$180.7	\$142.2	\$59.5	\$382.4
2028	\$186.9	\$151.7	\$61.8	\$400.3
2029	\$192.3	\$161.5	\$64.6	\$418.3
2030	\$196.8	\$171.5	\$67.8	\$436.1
2031	\$200.2	\$181.5	\$71.5	\$453.3
2032	\$202.7	\$191.5	\$75.8	\$470.0
2033	\$204.3	\$201.4	\$80.4	\$486.2
2034	\$205.3	\$211.2	\$85.5	\$501.9
2035	\$205.7	\$220.7	\$90.8	\$517.2

Access Services

Year	65-74	75-84	85+	Total
2023	\$8.1	\$6.6	\$2.1	\$16.8
2024	\$8.5	\$7.0	\$2.2	\$17.7
2025	\$8.9	\$7.5	\$2.2	\$18.7
2026	\$9.3	\$8.0	\$2.3	\$19.6
2027	\$9.6	\$8.6	\$2.4	\$20.6
2028	\$10.0	\$9.1	\$2.5	\$21.6
2029	\$10.3	\$9.7	\$2.6	\$22.6
2030	\$10.5	\$10.3	\$2.7	\$23.6
2031	\$10.7	\$10.9	\$2.9	\$24.5
2032	\$10.8	\$11.5	\$3.0	\$25.4
2033	\$10.9	\$12.1	\$3.2	\$26.3
2034	\$11.0	\$12.7	\$3.4	\$27.1
2035	\$11.0	\$13.3	\$3.6	\$27.9

Case Management

Year	65-74	75-84	85+	Total
2023	\$11.2	\$10.9	\$8.4	\$30.5
2024	\$11.8	\$11.6	\$8.6	\$32.0
2025	\$12.3	\$12.4	\$8.8	\$33.5
2026	\$12.8	\$13.2	\$9.1	\$35.2
2027	\$13.3	\$14.2	\$9.4	\$36.9
2028	\$13.8	\$15.1	\$9.8	\$38.6
2029	\$14.2	\$16.1	\$10.2	\$40.5
2030	\$14.5	\$17.1	\$10.7	\$42.3
2031	\$14.8	\$18.1	\$11.3	\$44.1
2032	\$15.0	\$19.1	\$12.0	\$46.0
2033	\$15.1	\$20.1	\$12.7	\$47.8
2034	\$15.1	\$21.0	\$13.5	\$49.7
2035	\$15.2	\$22.0	\$14.3	\$51.5

Home Health

Year	65-74	75-84	85+	Total
2023	\$33.2	\$29.8	\$17.1	\$80.1
2024	\$34.8	\$31.8	\$17.5	\$84.1
2025	\$36.4	\$34.0	\$18.0	\$88.3
2026	\$37.9	\$36.3	\$18.5	\$92.7
2027	\$39.4	\$38.8	\$19.2	\$97.3
2028	\$40.7	\$41.4	\$19.9	\$102.0
2029	\$41.9	\$44.1	\$20.8	\$106.8
2030	\$42.8	\$46.8	\$21.8	\$111.5
2031	\$43.6	\$49.6	\$23.1	\$116.2
2032	\$44.1	\$52.3	\$24.4	\$120.8
2033	\$44.5	\$55.0	\$25.9	\$125.4
2034	\$44.7	\$57.6	\$27.5	\$129.9
2035	\$44.8	\$60.2	\$29.3	\$134.3

Hospice

Year	65-74	75-84	85+	Total
2023	\$31.5	\$26.1	\$49.5	\$107.1
2024	\$33.0	\$27.8	\$50.7	\$111.6
2025	\$34.5	\$29.7	\$52.1	\$116.3
2026	\$36.0	\$31.7	\$53.7	\$121.4
2027	\$37.4	\$33.9	\$55.6	\$126.8
2028	\$38.6	\$36.2	\$57.8	\$132.6
2029	\$39.7	\$38.5	\$60.4	\$138.6
2030	\$40.7	\$40.9	\$63.4	\$144.9
2031	\$41.4	\$43.3	\$66.9	\$151.6
2032	\$41.9	\$45.7	\$70.8	\$158.4
2033	\$42.2	\$48.0	\$75.2	\$165.5
2034	\$42.4	\$50.4	\$79.9	\$172.7
2035	\$42.5	\$52.6	\$84.9	\$180.1

Total Medicaid LTSS

Year	65-74	75-84	85+	Total
2023	\$581.8	\$660.0	\$735.1	\$1,976.9
2024	\$610.1	\$704.5	\$752.9	\$2,067.5
2025	\$638.0	\$752.3	\$773.3	\$2,163.5
2026	\$664.9	\$803.8	\$797.1	\$2,265.8
2027	\$690.4	\$858.6	\$825.0	\$2,374.0
2028	\$713.7	\$916.1	\$857.7	\$2,487.5
2029	\$734.3	\$975.5	\$896.0	\$2,605.8
2030	\$751.5	\$1,035.8	\$940.8	\$2,728.2
2031	\$764.7	\$1,096.5	\$992.8	\$2,853.9
2032	\$774.1	\$1,156.9	\$1,051.5	\$2,982.5
2033	\$780.4	\$1,216.7	\$1,116.3	\$3,113.3
2034	\$784.0	\$1,275.5	\$1,186.3	\$3,245.7
2035	\$785.7	\$1,332.8	\$1,260.6	\$3,379.1

Appendix – Chapter 6 Micro Simulation

Report: Long-Term Services and Supports for Minnesota’s Older Population: Current and Future Utilization and Payments

November 2023

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Table 6A.1 shows the mapping used from the original categorization of LTSS sub-groups to the collapsed categories used in the micro simulation.

Table 6A.1 Collapsing of LTSS Subgroups

Original Category	Collapsed Category
DECEASED	DECEASED
EWC	EWC
EWR	EWR
MA NF 0-29 (CONFIRMED NF-LOC)	MA NF 0-29
MA NF 0-29 (NO NF-LOC)	
MA NF 30+ (NO NF-LOC)	MA NF 30-90
MA NF 30-90 (CONFIRMED NF-LOC)	
MA NF 30-90 (PROBABLE NF-LOC)	
MA NF 91+ (NF-LOC)	MA NF 91+
MA NO LTSS OR NF (NF-LOC)	MA Non-LTSS
MA NON-LTSS (NO NF-LOC)	
MA OTHER LTSS W/O WAIVER (NF-LOC)	MA Other LTSS W/O Waiver (Omitted to reduce complexity due to low sample size)
MA OTHER LTSS W/O WAIVER (NO NF-LOC)	
MA PCA W/O WAIVER (NF-LOC)	MA PCA W/O Waiver
MA PCA W/O WAIVER (NO NF-LOC)	
NON-MA AC (NF-LOC)	NON-MA AC
NON-MA NF 0-29 (CONFIRMED NF-LOC)	Non-MA NF 0-29
NON-MA NF 0-29 (NO NF-LOC)	
NON-MA NF 30+ (NO NF-LOC)	Non-MA NF 30+
NON-MA NF 30-90 (CONFIRMED NF-LOC)	
NON-MA NF 30-90 (PROBABLE NF-LOC)	
NON-MA NF 91+ (NF-LOC)	Non-MA NF 91+
NON-MA NO LTSS OR NF (NF-LOC)	NON-MA No LTSS or NF
NON-MA NON-LTSS (NO NF-LOC)	
NON-MA NF 0-29 (CONFIRMED NF-LOC) UNDER 65	Folded into respective Categories (birthday occurring during cohort initial year).
NON-MA NF 0-29 (NO NF-LOC) UNDER 65	
NON-MA NF 30+ (NO NF-LOC) UNDER 65	
NON-MA NF 30-90 (CONFIRMED NF-LOC) UNDER 65	
NON-MA NF 30-90 (PROBABLE NF-LOC) UNDER 65	
NON-MA NF 91+ (NF-LOC) UNDER 65	
NON-MA NO LTSS OR NF (NF-LOC) UNDER 65	
NON-MA NON-LTSS (NO NF-LOC) UNDER 65	
MA NF 0-29 (CONFIRMED NF-LOC) DISABILITY	Pulled out for separate analysis (entire person record pulled out).
MA NF 0-29 (NO NF-LOC) DISABILITY	

Original Category	Collapsed Category
MA NF 30-90 (CONFIRMED NF-LOC) DISABILITY	
MA NF 30-90 (PROBABLE NF-LOC) DISABILITY	
MA NF 30+ (NO NF-LOC) DISABILITY	
MA NF 91+ (NF-LOC) DISABILITY	
MA NO LTSS OR NF (NF-LOC) DISABILITY	
MA NON-LTSS (NO NF-LOC) DISABILITY	

*An indicator variable was created to note if individual was NFLOC or not.

Semi-Model Overview Details

A Markov model has two components, the group that an individual is in at a particular moment in time and how long they remain in that group. For our purposes the groups in the model are the LTSS categories (e.g., nursing facility, Elderly Waiver – Community, etc.) and the length of time in a group is represented by the months that individuals stay in these categories, as well as the number of months they are alive. The simulation is governed by a set of statistical parameters derived from the analysis of empirical data from the Minnesotans age 65 and older in the LTSS population. These parameters are the probabilities of making a transition from one LTSS category to another (e.g., nursing facility to community or back to the nursing facility) and the probabilities of staying in a LTSS category for different time periods (e.g., nursing facility length of stay).

The simulation begins with each person entering a LTSS category at a point in time and then proceeds for a set period of time. Each individual passing through the simulation results in a unique case history containing a detailed record of demographic and other characteristics and months spent in each LTSS category prior to death. The payment amount for care can be assigned to these case histories based on a payment distribution associated with each LTSS category (e.g., nursing facility per diem payments) at each time point (see Chapter 5 for more detail on payment amounts). By altering the size of a cohort, the age distribution, or the entry status probabilities various scenarios can be tested and compared. By repeatedly simulating cohorts, estimates of variability around the projection can be estimated.

The Markov formulation assumes that the probability of moving to a new group depends on current group membership, but not prior group membership. This formulation performs well at the system level although it may produce some unusual individual trajectories (i.e., the model is able to simulate group membership comparable to the overall observed numbers even if some of the simulated individual trajectories do not occur in the observed data).

Length of Time in an LTSS Category

The second important element of the model is how long individuals remain in a group until moving to a new group. For this work, time is measured on a monthly basis. Simulating individual trajectories of monthly group membership permits payment amounts to be assigned based on projected average monthly payment amounts associated with each group. Using probability distributions for time spent in each group allows the model to let the variability in the data impact the simulated outcomes. By repeating the simulation many times, a range of

possible outcomes and the likelihood of their occurrence can be estimated. This allows for a fuller understanding of what the worst, average, and best-case outcomes might be. By varying some of the model assumptions, such as age at entry or the number of individuals presenting for LTSS over time, the impact of these changes can be estimated. The following sections provide additional detail on the estimation of transition probabilities and holding times needed to generate case histories and provide these estimated parameters which were used in the simulation as they serve as potentially useful references.

Transition Probabilities

Table 6A.2 and Table 6A.3 display the observed transition counts and probabilities respectively. Table 6A.2 gives the absolute number of times a transition occurred in the data and Table 6A.3 gives the relative frequency of that occurrence. For both tables, the row label is the group membership occurring first and the column heading is the group membership occurring second (i.e., the individuals move from the row label to the column label).

For illustration, the box in the second row and second column of Table 6A.2 contains the number 7,597. This indicates that 7,597 individuals moved from EWC due to mortality. The corresponding box in Table 6A.3 is 19%, indicating that for 19% of those who moved out of EWC, it was due to mortality. The most frequent transitions from each group are illustrated. Figure 6A.1 illustrates the idea of transition probabilities or the likelihood an individual moves from one LTSS subgroup status to a second LTSS subgroup status. As an example of how to read the figure, the arrow going from the EWC oval to the EWR oval indicate that 32% of those leaving the Elderly Waiver Community subgroup enter into the Elderly Waiver Residential subgroup.

Figure 6A.1. Each oval indicates one of the 13 groups, and each arrow indicates a transition that occurred at least 20% of the time. The percentages next to the arrows indicate the percentage of time an individual moving from the group in the oval at the start of the arrow moved to the group in the oval at the end of the arrow. For example, in the top right of the figure, the arrow running from the oval MA NF 91+ to the oval death indicates that 75% of those leaving a Medicaid NF stay of 91 or more days, died.

Table 6A.6 through Table 6A.17 display the model adjusted transition probabilities from each of the 12 groups from which a transition is possible. For each group, a multinomial regression model was used to adjust transition probabilities based on the individual's initial demographic, health, functioning, and service use characteristics. The same set of characteristics are reported in each table, although some models do not include all characteristics. When a characteristic was dropped from the model, it is noted in the table footer. This was done to avoid model estimation issues and biased predictions (predictions that do not match observed values in a systematic way).

Additional Simulation Method Detail

In January of years 2-5 of each cohort a years' worth of individuals entered into the system (some directly into a service use, most into the non-service use subgroups representing those for which service use begins later in the year). Each cohort was simulated 150 times. An additional cohort was run one time (simulated 150 times) covering the years 2016-2020 with the pandemic effect removed, as a comparison group. All simulations utilize the same transition probability distributions and holding time distributions.

Holding Times

In addition to the transitions between groups, the second major component of the model is the length of time an individual remains in a group, sometimes referred to as the holding time. For the semi-Markov model, each transition path between two groups is modeled separately (e.g., given an individual will transition from EWC to EWR, how many months will they remain in EWC until they make the transition). These holding times are modeled using positive right skewed probability distributions. For each path the best fitting distribution of Gamma, Log-Normal, Weibull, Burr (Type 12), and Pareto (Type 2) was chosen using goodness-of-fit criterion. When model fit was not adversely affected, the scale parameters of the distribution were adjusted using a regression model with the same set of independent variables utilized in the multinomial regression models for transition probabilities. All distributions accounted for censoring (individuals remaining in the group until the end of the data period).

Figure 6A.15 through Figure 6A.86 display the holding time distribution for each transition used in the simulation. For each figure, the distribution parameters, median holding time (50th percentile) and probability of remaining in the original subgroup before transitioning to the next subgroup for at least 2 years are given. For example, Figure 6A. 15 indicates that for the time to transition between EWC and death was modeled using a Weibull distribution (with shape parameter equal to 0.97 and scale parameter equal to 20.73). Of those in EWC who would remain in EWC until death, 50% remained in EWC for 14.22 months or longer and 3.2% remained in EWC for 2 years or more prior to death.

Figure 6A.15 Holding Times: EWC to Death

Table 6A.2 Counts of Transition Occurrences for Collapsed LTSS Subgroup Categories

	DECEASED	EWC	EWR	MA NF 0- 29	MA NF 30-90	MA NF 91+	MA Non- LTSS	MA PCA No Waiv	NON -MA AC	Non- MA NF 0-29	NON- MA NF 30-90	NON- MA NF 91+	NON- MA NON- LTSS	Total
EWC	7597	0	12748	10343	794	14	4205	1721	125	57	7	0	2363	39974
EWR	10580	12244	0	8233	121	1	1958	11	13	47	0	0	1096	34304
MA NF 0- 29	2318	4044	4086	0	23091	0	3107	345	22	8	98	0	180	37299
MA NF 30- 90	2770	1793	2277	531	0	22839	1838	136	28	1	99	54	186	32552
MA NF 91+	25244	838	1707	970	16	0	3234	59	22	7	127	1322	227	33773
MA Non- LTSS	3619	14208	4393	12786	3679	1225	0	3021	349	127	17	6	4639	48069
MA PCA W/O Waiver	1330	3698	84	748	211	0	1884	0	6	6	1	0	612	8580
NON-MA AC	1048	505	608	312	19	0	1304	267	0	1869	118	1	2451	8502
NON-MA NF 30-90	6540	33	66	33	1228	324	103	4	337	838	0	24704	24815	59025
NON-MA NF 91+	15429	15	31	10	527	4691	51	1	37	449	9	0	6026	27276
NON-MA NON-LTSS	27517	3629	7624	2375	208	28	16924	160	5770	128868	9237	978	0	203318
Non-MA NF 0-29	9468	50	108	64	1120	0	253	6	1226	0	47564	0	80792	140651
Total	113460	41057	33732	36405	31014	29122	34861	5731	7935	132277	57277	27065	123387	673323

Table 6A.3 Observed Transition Probabilities for Collapsed LTSS Subgroup Categories

	DECEASED	EWC	EWR	MA NF 0-29	MA NF 30-90	MA NF 91+	MA Non- LTSS	MA PCA No Waiv	NON -MA AC	Non- MA NF 0- 29	NON- MA NF 30-90	NON- MA NF 91+	NON- MA NON- LTSS	Total
EWC	19%	0%	32%	26%	2%	0%	11%	4%	0%	0%	0%	0%	6%	39974
EWR	31%	36%	0%	24%	0%	0%	6%	0%	0%	0%	0%	0%	3%	34304
MA NF 0-29	6%	11%	11%	0%	62%	0%	8%	1%	0%	0%	0%	0%	0%	37299
MA NF 30-90	9%	6%	7%	2%	0%	70%	6%	0%	0%	0%	0%	0%	1%	32552
MA NF 91+	75%	2%	5%	3%	0%	0%	10%	0%	0%	0%	0%	4%	1%	33773
MA Non-LTSS	8%	30%	9%	27%	8%	3%	0%	6%	1%	0%	0%	0%	10%	48069
MA PCA W/O Waiver	16%	43%	1%	9%	2%	0%	22%	0%	0%	0%	0%	0%	7%	8580
NON-MA AC	12%	6%	7%	4%	0%	0%	15%	3%	0%	22%	1%	0%	29%	8502
NON-MA NF 30-90	11%	0%	0%	0%	2%	1%	0%	0%	1%	1%	0%	42%	42%	60710
NON-MA NF 91+	57%	0%	0%	0%	2%	17%	0%	0%	0%	2%	0%	0%	22%	25389
NON-MA NON- LTSS	14%	2%	4%	1%	0%	0%	8%	0%	3%	63%	5%	0%	0%	203318
Non-MA NF 0- 29	7%	0%	0%	0%	1%	0%	0%	0%	1%	0%	34%	0%	57%	140651
Total	17%	6%	5%	5%	5%	4%	5%	1%	1%	20%	9%	4%	18%	673121

Figure 6A.1 illustrates the idea of transition probabilities or the likelihood an individual moves from one LTSS subgroup status to a second LTSS subgroup status. As an example of how to read the figure, the arrow going from the EWC oval to the EWR oval indicate that 32% of those leaving the Elderly Waiver Community subgroup enter into the Elderly Waiver Residential subgroup.

Figure 6A.1 Markov Model Diagram: Only Transitions Greater than 20% are Pictured

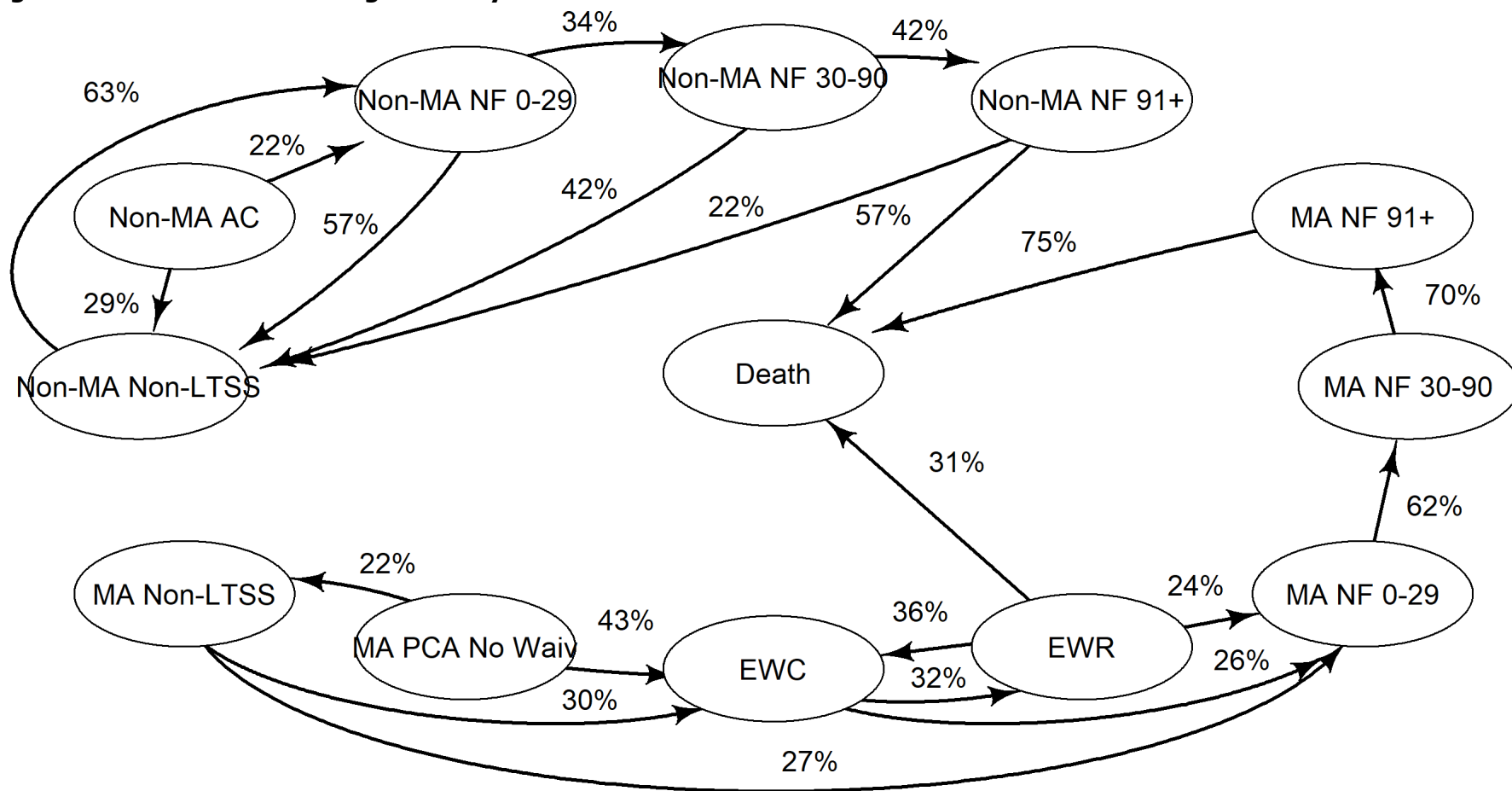


Figure 6A.2 illustrates the idea of transition probabilities or the likelihood an individual moves from one LTSS subgroup status to a second LTSS subgroup status. In this figure, Medicaid enrolled NF stays are collapsed into one group and the non-Medicaid NF stays

are collapsed into a second group. As an example of how to read the figure, the arrow going from the EWC oval to the EWR oval indicate that 32% of those leaving the Elderly Waiver Community subgroup enter into the Elderly Waiver Residential subgroup.

Figure 6A.2 Collapsed Markov Diagram: Only Transitions Greater than 20% are Pictured

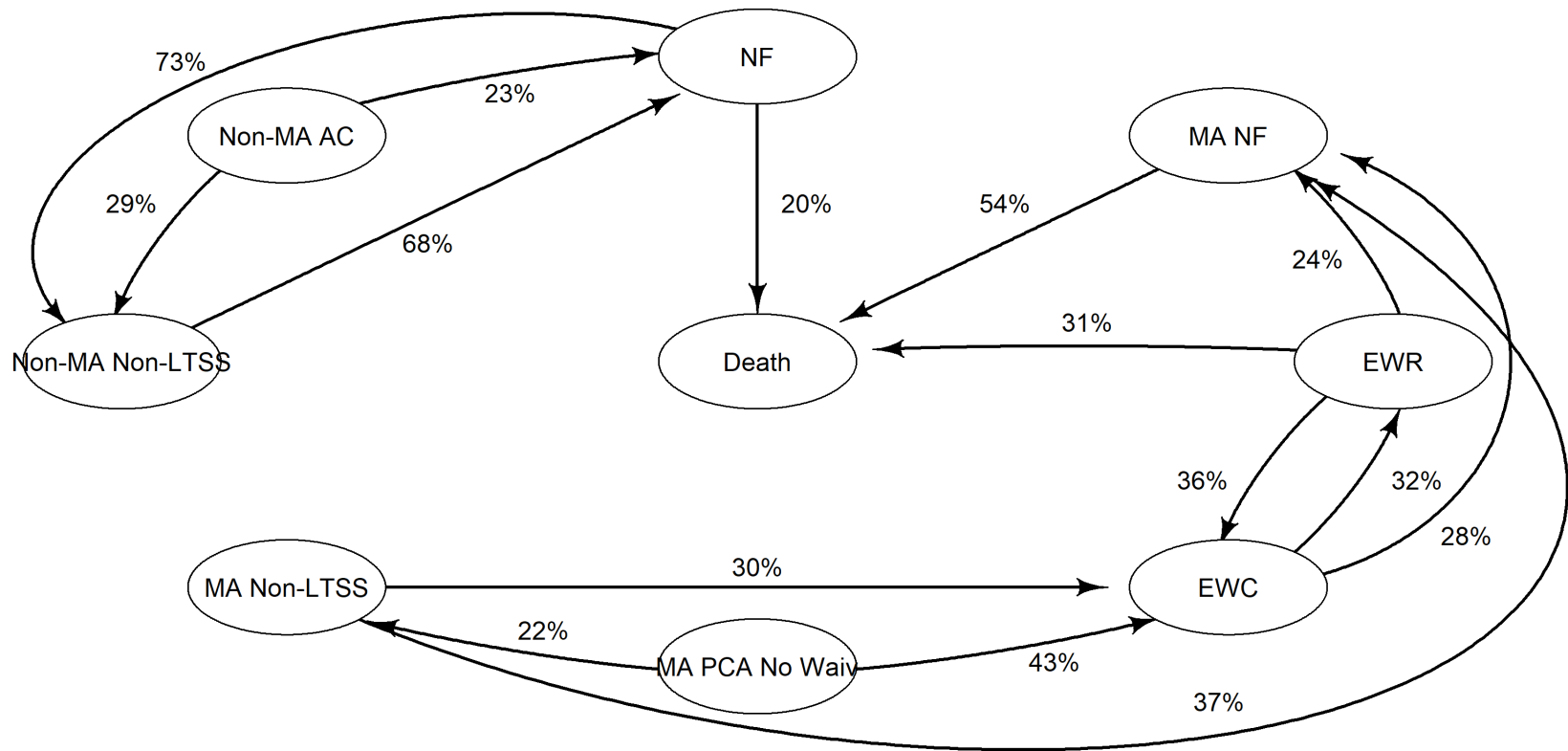


Figure 6A.3 displays the observed transition rates between the groups that include Medicaid enrollees, the groups that do not include Medicaid enrollees, and mortality. Approximately 10% of the time, when an individual from a group that does not include Medicaid enrollees transitions to a new group, they enroll in Medicaid.

Figure 6A.3 Observed Transition Rates of Medicaid Conversion and Mortality

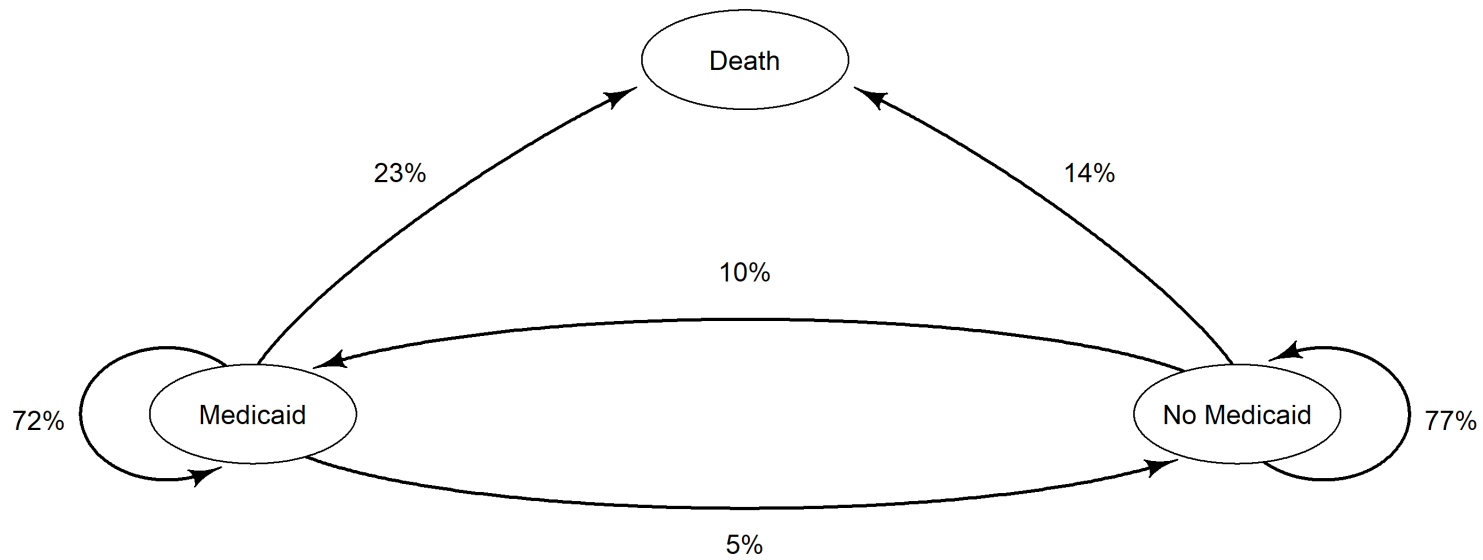


Table 6A.4 displays the distribution of entry LTSS subgroup within each age group status assumed for each scenario. These are for the inflows into the system occurring in years 2-5 of each cohort.

Table 6A.4 Distribution of Initial LTSS Subgroup by Age Group for Entry in Year 2 of Cohort or Later

	Base Case			COVID Case/NF Shift Case		
	Age: 65-74	Age: 75-84	Age: 85+	Age: 65-74	Age: 75-84	Age: 85+
EWC	1.1%	0.6%	0.3%	1.3%	0.5%	0.3%
EWR	0.1%	0.3%	0.5%	0.3%	0.5%	0.5%
MA NF 0-29	0.7%	0.7%	0.5%	0.6%	0.5%	0.3%
MA NF 30-90	0.3%	0.0%	0.1%	0.4%	0.0%	0.0%
MA NF 91+	1.6%	0.0%	0.0%	1.6%	0.0%	0.0%
MA Non-LTSS	24.4%	7.3%	2.8%	23.0%	6.5%	2.6%
MA PCA W/O Waiver	4.9%	0.0%	0.1%	5.7%	0.0%	0.1%
NON-MA AC	0.3%	0.3%	0.3%	0.2%	0.3%	0.3%
NON-MA NF 30-90	0.3%	0.3%	0.3%	0.3%	0.3%	0.1%
NON-MA NF 91+	0.3%	0.0%	0.0%	0.3%	0.0%	0.0%
NON-MA NON-LTSS	62.4%	84.7%	88.2%	62.4%	85.5%	88.3%
Non-MA NF 0-29	3.6%	5.9%	7.1%	3.9%	5.9%	7.3%

Table 6A.5 displays the age group distribution of the LTSS population assumed for each simulation year.

Table 6A.5 Assumed Age Group Distribution by Year of LTSS Users

Simulation Year	Age 60-74	Age 75-84	Age 85+
2016	25%	32%	43%
2017	25%	33%	42%
2018	26%	34%	41%
2019	26%	35%	40%
2020	26%	35%	39%
2025	26%	36%	38%
2026	26%	37%	38%
2027	25%	37%	37%
2028	25%	38%	37%
2029	25%	39%	37%
2030	24%	39%	37%
2031	23%	40%	37%
2032	23%	40%	37%
2033	22%	40%	38%
2034	21%	40%	39%
2035	20%	40%	39%
2036	19%	40%	40%
2037	19%	40%	41%
2038	18%	40%	42%
2039	17%	40%	43%

Table 6A.6 Multinomial Model: Marginal Transition Probabilities from EWC

Variable	DECEASED	EWR	MA NF 0-29	MA NF 30-90	MA Non-LTSS	MA PCA W/O Waiver	NON-MA AC	NON-MA NON-LTSS
Baseline	34%	21%	17%	1%	11%	3%	0%	13%
Age 74-84	34%	21%	17%	1%	11%	3%	0%	13%
Age 85+	34%	21%	17%	1%	11%	3%	0%	13%
Div/Sep/Single/Othe	13%	39%	24%	2%	15%	2%	0%	5%
Widowed	17%	44%	21%	2%	9%	2%	1%	5%
Other Metro Area	34%	21%	17%	1%	11%	3%	0%	13%
Outlying Areas	34%	21%	17%	1%	11%	3%	0%	13%
Rural	34%	21%	17%	1%	11%	3%	0%	13%
Unreported Location	34%	21%	17%	1%	11%	3%	0%	13%
Female	34%	21%	17%	1%	11%	3%	0%	13%
Asian/Pacific	34%	21%	17%	1%	11%	3%	0%	13%
Black/African	34%	21%	17%	1%	11%	3%	0%	13%
Hispanic	34%	21%	17%	1%	11%	3%	0%	13%
Multiple Races	34%	21%	17%	1%	11%	3%	0%	13%
Native American	34%	21%	17%	1%	11%	3%	0%	13%
Unreported Race	34%	21%	17%	1%	11%	3%	0%	13%
Does not meet	34%	21%	17%	1%	11%	3%	0%	13%
Prior NF Use	32%	25%	22%	3%	10%	1%	0%	6%
Prior HCBS Use	39%	12%	20%	1%	8%	8%	0%	13%
Dementia	34%	21%	17%	1%	11%	3%	0%	13%
ADL Need Low	34%	21%	17%	1%	11%	3%	0%	13%
ADL Need High	34%	21%	17%	1%	11%	3%	0%	13%

Div/Sep/Single = Divorced or Separated or Single Never Married. NFLOC = Nursing Facility Level of Care, NF = Nursing Facility, HCBS = Home and Community Based Care, ADL = Activity of Daily Living. Baseline: Married, no Prior NF or HCBS use, no dementia diagnosis. Variables not included in the model to avoid estimation errors or biased predictions: Age group, gender, residence location group, race and ethnicity group, meeting NFLOC, ADL assistance need, and pandemic time period.

Table 6A.7 Multinomial Models: Marginal Transition Probabilities from EWR

Variable	DECEASED	EWC	MA NF 0-29	MA NF 30-90	MA Non-LTSS	NON-MA NON-LTSS
Baseline	33%	34%	18%	0%	6%	10%
Age 74-84	41%	27%	18%	0%	5%	9%
Age 85+	51%	21%	17%	0%	4%	7%
Div/Sep/Single/Other	9%	50%	28%	0%	9%	3%
Widowed	14%	45%	27%	0%	8%	5%
Other Metro Area	38%	34%	13%	0%	4%	10%
Outlying Areas	33%	29%	19%	0%	5%	14%
Rural	33%	31%	17%	0%	5%	12%
Unreported Location	3%	40%	0%	0%	33%	25%
Female	33%	34%	18%	0%	6%	10%
Asian/Pacific Islander	24%	57%	10%	0%	3%	6%
Black/African American	17%	46%	18%	0%	7%	11%
Hispanic	29%	36%	17%	0%	7%	10%
Multiple Races	7%	64%	16%	1%	5%	6%
Native American	33%	39%	15%	0%	6%	7%
Unreported Race	44%	38%	1%	0%	2%	15%
Does not meet NFLOC	33%	34%	18%	0%	6%	10%
Prior NF Use	31%	33%	18%	1%	8%	9%
Prior HCBS Use	37%	32%	21%	0%	4%	5%
Dementia	46%	27%	14%	0%	4%	9%
ADL Need Low	25%	42%	15%	0%	5%	13%
ADL Need High	59%	25%	8%	0%	2%	6%

Div/Sep/Single = Divorced or Separated or Single Never Married. NFLOC = Nursing Facility Level of Care, NF = Nursing Facility, HCBS = Home and Community Based Care, ADL = Activity of Daily Living. Baseline: Age 65-74, Married, Meets NFLOC, Twin Cities, Male, White (non-Hispanic), no Prior NF or HCBS use, medium ADL need for assistance, no dementia diagnosis, pre-Pandemic period. Variables not included in the model to avoid estimation errors or biased predictions: Age group, marital status, meeting NFLOC, ADL assistance need, and pandemic time period.

Table 6A.8 Multinomial Models: Marginal Transition Probabilities from MA NF 0-29

Variable	DECEASED	EWC	EWR	MA NF 30-90	MA Non-LTSS	MA PCA	NON-MA AC	NON-MA NON-LTSS
Baseline	12%	2%	0%	57%	26%	1%	0.1%	2%
Age 74-84	13%	1%	0%	63%	19%	0%	0.1%	2%
Age 85+	17%	1%	0%	67%	13%	0%	0.0%	2%
Div/Sep/Single/Other	4%	1%	0%	62%	32%	0%	0.1%	1%
Widowed	5%	1%	0%	63%	29%	0%	0.1%	1%
Other Metro Area	12%	1%	0%	61%	24%	0%	0.2%	2%
Outlying Areas	14%	2%	0%	65%	17%	0%	0.2%	2%
Rural	11%	2%	0%	65%	20%	0%	0.1%	3%
Unreported Location	12%	2%	0%	57%	26%	1%	0.1%	2%
Female	11%	2%	0%	55%	27%	1%	0.1%	3%
Asian/Pacific Islander	14%	4%	0%	44%	27%	6%	0.0%	5%
Black/African	8%	3%	0%	52%	30%	4%	0.0%	3%
Hispanic	11%	3%	0%	42%	41%	1%	0.0%	1%
Multiple Races	13%	3%	0%	51%	26%	1%	0.0%	5%
Native American	10%	2%	0%	49%	30%	4%	0.0%	5%
Unreported Race	12%	2%	0%	57%	26%	1%	0.1%	2%
Does not meet NFLOC	12%	2%	0%	57%	26%	1%	0.1%	2%
Prior NF Use	11%	2%	0%	65%	19%	1%	0.1%	2%
Prior HCBS Use	15%	3%	0%	59%	18%	3%	0.1%	1%
Dementia	9%	1%	0%	72%	16%	0%	0.1%	1%
ADL Need Low	12%	2%	0%	57%	26%	1%	0.1%	2%
ADL Need High	12%	2%	0%	57%	26%	1%	0.1%	2%

Div/Sep/Single = Divorced or Separated or Single Never Married. NFLOC = Nursing Facility Level of Care, NF = Nursing Facility, HCBS = Home and Community Based Care, ADL = Activity of Daily Living. Baseline: Age 65-74, Married, Meets NFLOC, Twin Cities, Male, White (non-Hispanic), no Prior NF or HCBS use, medium ADL need for assistance, no dementia diagnosis, pre-Pandemic period. Variables not included in the model to avoid estimation errors or biased predictions: ADL assistance need.

Table 6A.9 Multinomial Models: Marginal Transition Probabilities from MA NF 30-90

Variable	DECEASED	EWC	EWR	MA NF 0-29	MA NF 91+	MA Non-LTSS	MA PCA W/O Waiver	NON-MA AC	NON-MA NON-LTSS
Baseline	19%	6%	3%	3%	48%	16%	0%	0%	4%
Age 74-84	23%	4%	4%	3%	52%	11%	0%	0%	3%
Age 85+	29%	2%	3%	2%	56%	6%	0%	0%	2%
Div/Sep/Single/Oth	6%	6%	8%	3%	58%	17%	0%	0%	1%
Widowed	9%	5%	7%	3%	58%	16%	0%	1%	1%
Other Metro Area	16%	9%	4%	2%	47%	16%	0%	0%	5%
Outlying Areas	19%	6%	2%	3%	48%	14%	0%	0%	9%
Rural	18%	7%	2%	2%	52%	13%	0%	0%	5%
Unreported	19%	6%	3%	3%	48%	16%	0%	0%	4%
Female	19%	8%	4%	4%	48%	14%	1%	0%	3%
Asian/Pacific	13%	14%	1%	5%	39%	18%	7%	0%	3%
Black/African	17%	11%	2%	3%	44%	16%	4%	0%	2%
Hispanic	13%	9%	3%	3%	41%	26%	1%	0%	4%
Multiple Races	20%	6%	3%	2%	44%	25%	0%	0%	0%
Native American	18%	7%	1%	5%	39%	23%	2%	0%	5%
Unreported Race	40%	8%	20%	0%	32%	0%	0%	0%	0%
Does not meet	9%	0%	0%	2%	79%	9%	0%	0%	1%
Prior NF Use	17%	5%	3%	4%	51%	14%	0%	0%	6%
Prior HCBS Use	25%	13%	5%	3%	43%	8%	1%	0%	2%
Dementia	16%	4%	4%	2%	63%	9%	0%	0%	1%
ADL Need Low	19%	6%	3%	3%	48%	16%	0%	0%	4%
ADL Need High	19%	6%	3%	3%	48%	16%	0%	0%	4%

Div/Sep/Single = Divorced or Separated or Single Never Married. NFLOC = Nursing Facility Level of Care, NF = Nursing Facility, HCBS = Home and Community Based Care, ADL = Activity of Daily Living. Baseline: Age 65-74, Married, Meets NFLOC, Twin Cities, Male, White (non-Hispanic), no Prior NF or HCBS use, medium ADL need for assistance, no dementia diagnosis, pre-Pandemic period. Variables not included in the model to avoid estimation errors or biased predictions: ADL assistance need.

Table 6A.10 Multinomial Models: Marginal Transition Probabilities from MA NF 91+

Variable	DECEASED	EWC	EWR	MA NF 0-29	MA Non-LTSS	MA PCA W/O Waiver	NON-MA AC	Non-MA NF 91+	NON-MA NON-LTSS
Baseline	49%	5%	14%	5%	19%	0%	0%	6%	1%
Age 74-84	68%	2%	7%	4%	12%	0%	0%	6%	1%
Age 85+	83%	1%	3%	2%	6%	0%	0%	6%	0%
Div/Sep/Single/Oth	49%	5%	14%	5%	19%	0%	0%	6%	1%
Widowed	49%	5%	14%	5%	19%	0%	0%	6%	1%
Other Metro Area	49%	6%	16%	4%	17%	0%	0%	6%	2%
Outlying Areas	53%	6%	12%	4%	17%	0%	0%	6%	1%
Rural	54%	7%	11%	3%	17%	0%	0%	7%	1%
Unreported	49%	5%	14%	5%	19%	0%	0%	6%	1%
Female	50%	6%	13%	5%	17%	0%	0%	7%	1%
Asian/Pacific	36%	12%	13%	3%	24%	4%	0%	6%	2%
Black/African	29%	12%	15%	7%	27%	2%	0%	6%	2%
Hispanic	37%	7%	10%	5%	36%	2%	0%	3%	1%
Multiple Races	42%	0%	21%	0%	21%	0%	0%	12%	4%
Native American	42%	5%	10%	7%	26%	2%	0%	7%	1%
Unreported Race	49%	5%	14%	5%	19%	0%	0%	6%	1%
Does not meet	33%	2%	1%	9%	47%	0%	0%	2%	4%
Prior NF Use	49%	5%	14%	5%	19%	0%	0%	6%	1%
Prior HCBS Use	50%	8%	14%	5%	18%	0%	0%	4%	1%
Dementia	49%	5%	14%	5%	19%	0%	0%	6%	1%
ADL Need Low	49%	5%	14%	5%	19%	0%	0%	6%	1%
ADL Need High	49%	5%	14%	5%	19%	0%	0%	6%	1%

Div/Sep/Single = Divorced or Separated or Single Never Married. NFLOC = Nursing Facility Level of Care, NF = Nursing Facility, HCBS = Home and Community Based Care, ADL = Activity of Daily Living. Baseline: Age 65-74, Meets NFLOC, Twin Cities, Male, White (non-Hispanic), no Prior HCBS use, pre-Pandemic period. Variables not included in the model to avoid estimation errors or biased predictions: marital status, prior NF use, ADL need for assistance, cognitive status.

Table 6A.11 Multinomial Models: Marginal Transition Probabilities from MA Non-LTSS

Variable	DECEASED	EWC	EWR	MA NF 0-29	MA NF 30-90	MA NF 91+	MA PCA W/O Waiver	NON- MA AC	Non-MA NF 0-29	NON- MA NF 30-90	NON-MA NON- LTSS
Baseline	12%	29%	2%	18%	5%	1%	12%	1%	0%	0%	21%
Age 74-84	12%	29%	2%	18%	5%	1%	12%	1%	0%	0%	21%
Age 85+	12%	29%	2%	18%	5%	1%	12%	1%	0%	0%	21%
Div/Sep/Single/Other	7%	34%	5%	22%	6%	1%	7%	1%	0%	0%	16%
Widowed	9%	26%	8%	25%	9%	2%	8%	2%	0%	0%	13%
Other Metro Area	14%	21%	4%	19%	5%	1%	12%	1%	0%	0%	22%
Outlying Areas	14%	22%	4%	24%	7%	1%	3%	2%	0%	0%	23%
Rural	15%	22%	3%	24%	6%	1%	7%	1%	0%	0%	21%
Unreported Location	6%	15%	0%	0%	0%	0%	10%	0%	0%	0%	68%
Female	9%	35%	3%	14%	4%	1%	12%	1%	0%	0%	20%
Asian/Pacific Islander	12%	29%	2%	18%	5%	1%	12%	1%	0%	0%	21%
Black/African	12%	29%	2%	18%	5%	1%	12%	1%	0%	0%	21%
Hispanic	12%	29%	2%	18%	5%	1%	12%	1%	0%	0%	21%
Multiple Races	12%	29%	2%	18%	5%	1%	12%	1%	0%	0%	21%
Native American	12%	29%	2%	18%	5%	1%	12%	1%	0%	0%	21%
Unreported Race	12%	29%	2%	18%	5%	1%	12%	1%	0%	0%	21%
Does not meet	5%	35%	2%	27%	3%	1%	10%	1%	0%	0%	15%
Prior NF Use	28%	9%	2%	18%	18%	4%	2%	1%	0%	0%	18%
Prior HCBS Use	11%	21%	1%	9%	5%	1%	28%	1%	0%	0%	23%
Dementia	14%	25%	7%	22%	6%	2%	8%	1%	0%	0%	14%
ADL Need Low	12%	29%	2%	18%	5%	1%	12%	1%	0%	0%	21%
ADL Need High	12%	29%	2%	18%	5%	1%	12%	1%	0%	0%	21%

Div/Sep/Single = Divorced or Separated or Single Never Married. NFLOC = Nursing Facility Level of Care, NF = Nursing Facility, HCBS = Home and Community Based Care, ADL = Activity of Daily Living. Baseline: Age 65-74, Married, Meets NFLOC, Twin Cities, Male, White (non-Hispanic), no Prior NF or HCBS use, medium ADL need for assistance, no dementia diagnosis, pre-Pandemic period. Variables not included in the model to avoid estimation errors or biased predictions: Age group, race and ethnicity, prior NF use, prior HCBS use, and ADL assistance need.

Table 6A.12 Multinomial Models: Marginal Transition Probabilities from PCA without a Waiver

Variable	DECEASED	EWC	EWR	MA NF 0-29	MA NF 30-90	MA Non-LTSS	NON-MA NON-LTSS
Baseline	20%	38%	1%	11%	5%	17%	9%
Age 74-84	20%	38%	1%	11%	5%	17%	9%
Age 85+	20%	38%	1%	11%	5%	17%	9%
Div/Sep/Single/Other	10%	37%	5%	22%	7%	16%	4%
Widowed	16%	29%	7%	23%	6%	14%	5%
Other Metro Area	19%	24%	1%	6%	4%	32%	15%
Outlying Areas	15%	37%	1%	9%	12%	13%	13%
Rural	23%	28%	1%	10%	4%	21%	13%
Unreported Location	1%	10%	0%	0%	0%	28%	62%
Female	16%	43%	1%	10%	6%	16%	8%
Asian/Pacific Islander	22%	49%	0%	2%	0%	18%	9%
Black/African American	12%	50%	0%	4%	1%	24%	10%
Hispanic	24%	41%	0%	3%	1%	20%	12%
Multiple Races	12%	35%	0%	1%	0%	35%	17%
Native American	29%	28%	0%	8%	1%	25%	9%
Unreported Race	19%	15%	0%	0%	0%	24%	41%
Does not meet NFLOC	14%	41%	1%	7%	2%	26%	9%
Prior NF Use	19%	22%	1%	22%	18%	13%	6%
Prior HCBS Use	24%	38%	0%	9%	3%	17%	8%
Dementia	28%	32%	2%	13%	6%	11%	8%
ADL Need Low	20%	38%	1%	11%	5%	17%	9%
ADL Need High	20%	38%	1%	11%	5%	17%	9%

Div/Sep/Single = Divorced or Separated or Single Never Married. NFLOC = Nursing Facility Level of Care, NF = Nursing Facility, HCBS = Home and Community Based Care, ADL = Activity of Daily Living. Baseline: Age 65-74, Married, Meets NFLOC, Twin Cities, Male, White (non-Hispanic), no Prior NF or HCBS use, medium ADL need for assistance, no dementia diagnosis, pre-Pandemic period. Variables not included in the model to avoid estimation errors or biased predictions: Age group, race and ethnicity, and ADL assistance need.

Table 6A.13 Multinomial Models: Marginal Transition Probabilities from Alternative Care

Variable	DECEASED	EWC	EWR	MA NF 0-29	MA NF 30-90	MA Non- LTSS	MA PCA W/O Waiver	Non-MA NF 0-29	NON- MA NF 30-90	NON- MA NON-
Baseline	19%	5%	2%	2%	0%	7%	3%	28%	2%	32%
Age 74-84	22%	5%	3%	2%	0%	7%	2%	30%	2%	28%
Age 85+	24%	4%	3%	2%	0%	7%	3%	27%	1%	28%
Div/Sep/Single/ Widowed	15%	3%	3%	4%	0%	12%	5%	32%	4%	22%
Other Metro	18%	2%	2%	4%	0%	11%	6%	31%	4%	21%
Outlying Areas	13%	8%	2%	2%	0%	12%	2%	26%	2%	33%
Rural	23%	5%	2%	1%	0%	8%	1%	28%	2%	30%
Unreported	15%	8%	2%	2%	0%	10%	2%	23%	1%	36%
Female	19%	5%	2%	2%	0%	7%	3%	28%	2%	32%
Asian/Pacific	15%	8%	2%	1%	0%	7%	3%	30%	2%	33%
Black/African	19%	5%	2%	2%	0%	7%	3%	28%	2%	32%
Hispanic	19%	5%	2%	2%	0%	7%	3%	28%	2%	32%
Multiple Races	19%	5%	2%	2%	0%	7%	3%	28%	2%	32%
Native American	19%	5%	2%	2%	0%	7%	3%	28%	2%	32%
Unreported Race	19%	5%	2%	2%	0%	7%	3%	28%	2%	32%
Does not meet	19%	5%	2%	2%	0%	7%	3%	28%	2%	32%
Prior NF Use	24%	4%	2%	2%	0%	9%	3%	35%	4%	18%
Prior HCBS Use	19%	5%	2%	2%	0%	7%	3%	28%	2%	32%
Dementia	17%	8%	3%	2%	0%	10%	4%	22%	2%	32%
ADL Need Low	14%	8%	2%	1%	0%	9%	1%	18%	1%	45%
ADL Need High	33%	4%	0%	0%	0%	1%	1%	7%	1%	53%

Div/Sep/Single = Divorced or Separated or Single Never Married. NFLOC = Nursing Facility Level of Care, NF = Nursing Facility, HCBS = Home and Community Based Care, ADL = Activity of Daily Living. Baseline: Age 65-74, Married, Meets NFLOC, Twin Cities, Male, White (non-Hispanic), no Prior NF or HCBS use, medium ADL need for assistance, no dementia diagnosis, pre-Pandemic period. Variables not included in the model to avoid estimation errors or biased predictions: Race and ethnicity, prior HCBS use, and pandemic time period.

Table 6A.14 Multinomial Models: Marginal Transition Probabilities from Non-Medicaid Nursing Facility Stay 0-29 Days

Variable	DECEASED	EWC	EWR	MA NF 0-29	MA NF 30-90	MA Non-LTSS	MA PCA W/O Waiver	NON-MA AC	NON-MA NF 30-90	NON-MA NON-LTSS
Baseline	8%	0%	0%	0%	2%	1%	0%	32%	28%	29%
Age 74-84	11%	0%	0%	0%	2%	1%	0%	25%	32%	29%
Age 85+	15%	0%	0%	0%	3%	0%	0%	19%	37%	24%
Div/Sep/Single/	6%	0%	1%	0%	6%	2%	0%	43%	23%	19%
Widowed	6%	0%	0%	0%	4%	1%	0%	43%	25%	21%
Other Metro	8%	0%	0%	0%	2%	0%	0%	21%	38%	31%
Outlying Areas	9%	0%	0%	0%	2%	1%	0%	26%	37%	25%
Rural	10%	0%	0%	0%	3%	1%	0%	22%	43%	21%
Unreported	8%	0%	0%	0%	2%	1%	0%	32%	28%	29%
Female	5%	0%	0%	0%	2%	1%	0%	35%	26%	31%
Asian/Pacific	10%	1%	0%	0%	2%	3%	0%	12%	34%	38%
Black/African	6%	0%	0%	0%	2%	2%	0%	43%	25%	22%
Hispanic	7%	1%	0%	0%	2%	2%	0%	29%	30%	29%
Multiple Races	9%	0%	0%	0%	2%	0%	0%	59%	14%	16%
Native American	9%	0%	0%	1%	3%	3%	0%	18%	30%	37%
Unreported	15%	0%	0%	0%	0%	0%	0%	20%	25%	41%
Does not meet	5%	0%	0%	0%	0%	0%	0%	0%	24%	71%
Prior NF Use	8%	0%	0%	0%	3%	1%	0%	28%	36%	25%
Prior HCBS Use	8%	0%	0%	0%	2%	1%	0%	49%	23%	15%
Dementia	8%	0%	0%	0%	2%	1%	0%	32%	28%	29%
ADL Need Low	8%	0%	0%	0%	2%	1%	0%	32%	28%	29%
ADL Need High	8%	0%	0%	0%	2%	1%	0%	32%	28%	29%

Div/Sep/Single = Divorced or Separated or Single Never Married. NFLOC = Nursing Facility Level of Care, NF = Nursing Facility, HCBS = Home and Community Based Care, ADL = Activity of Daily Living. Baseline: Age 65-74, Married, Meets NFLOC, Twin Cities, Male, White (non-Hispanic), no Prior NF or HCBS use, pre-Pandemic period. Variables not included in the model to avoid estimation errors or biased predictions: Dementia, ADL.

Table 6A.15 Multinomial Models: Marginal Transition Probabilities from Non-Medicaid Nursing Facility 30-90 Day Stay

Variable	DECEASED	EWC	EWR	MA NF 0-29	MA NF 30-90	MA Non-LTSS	MA PCA W/O Waiver	NON-MA AC	NON-MA NF 30-90	NON-MA NON-LTSS
Baseline	9%	0%	0%	0%	1%	0%	0%	0%	2%	26%
Age 74-84	11%	0%	0%	0%	1%	0%	0%	0%	2%	30%
Age 85+	16%	0%	0%	0%	1%	0%	0%	0%	1%	38%
Div/Sep/Single/Oth	9%	0%	0%	0%	4%	1%	1%	1%	2%	29%
Widowed	9%	0%	0%	0%	2%	1%	1%	1%	2%	30%
Other Metro Area	8%	0%	0%	0%	1%	0%	0%	0%	1%	27%
Outlying Areas	10%	0%	0%	0%	1%	0%	0%	0%	2%	31%
Rural	10%	0%	0%	0%	1%	0%	0%	0%	1%	36%
Unreported	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Female	6%	0%	0%	0%	1%	0%	0%	0%	2%	22%
Asian/Pacific	9%	0%	0%	0%	1%	0%	0%	0%	2%	26%
Black/African	9%	0%	0%	0%	1%	0%	0%	0%	3%	31%
Hispanic	7%	0%	0%	0%	0%	0%	1%	0%	3%	25%
Multiple Races	9%	0%	0%	0%	1%	0%	0%	0%	9%	20%
Native American	15%	0%	0%	0%	1%	0%	1%	1%	2%	23%
Unreported Race	10%	0%	0%	0%	0%	0%	0%	0%	1%	14%
Does not meet	6%	0%	0%	0%	1%	0%	0%	0%	1%	51%
Prior NF Use	9%	0%	0%	0%	1%	0%	0%	0%	2%	34%
Prior HCBS Use	15%	0%	0%	1%	5%	1%	1%	11%	2%	27%
Dementia	9%	0%	0%	0%	1%	0%	0%	0%	2%	26%
ADL Need Low	9%	0%	0%	0%	1%	0%	0%	0%	2%	26%
ADL Need High	9%	0%	0%	0%	1%	0%	0%	0%	2%	26%

Div/Sep/Single = Divorced or Separated or Single Never Married. NFLOC = Nursing Facility Level of Care, NF = Nursing Facility, HCBS = Home and Community Based Care, ADL = Activity of Daily Living. Baseline: Age 65-74, Married, Meets NFLOC, Twin Cities, Male, White (non-Hispanic), no Prior NF or HCBS use, pre-Pandemic period. Variables not included in the model to avoid estimation errors or biased predictions: Dementia, ADL.

Table 6A.16 Multinomial Models: Marginal Transition Probabilities from Non-Medicaid Nursing Facility 91+ Day Stay

Variable	DECEASED	EWC	EWR	MA NF 0-29	MA NF 30-90	MA NF 91+	MA Non- LTSS	NON- MA AC	Non-MA NF 0-29	NON- MA NF 30-90	NON-MA NON- LTSS
Baseline	67%	0%	0%	0%	0%	4%	0%	0%	2%	0%	26%
Age 74-84	67%	0%	0%	0%	0%	4%	0%	0%	2%	0%	26%
Age 85+	67%	0%	0%	0%	0%	4%	0%	0%	2%	0%	26%
Div/Sep/Single/Oth	49%	0%	1%	0%	0%	21%	0%	0%	3%	0%	25%
Widowed	68%	0%	0%	0%	0%	14%	0%	0%	1%	0%	16%
Other Metro Area	66%	0%	0%	0%	0%	5%	0%	0%	2%	0%	27%
Outlying Areas	69%	0%	0%	0%	0%	5%	0%	0%	2%	0%	24%
Rural	69%	0%	0%	0%	0%	5%	0%	0%	1%	0%	25%
Unreported	67%	0%	0%	0%	0%	4%	0%	0%	2%	0%	26%
Female	61%	0%	0%	0%	0%	6%	0%	0%	2%	0%	30%
Asian/Pacific	67%	0%	0%	0%	0%	4%	0%	0%	2%	0%	26%
Black/African	67%	0%	0%	0%	0%	4%	0%	0%	2%	0%	26%
Hispanic	67%	0%	0%	0%	0%	4%	0%	0%	2%	0%	26%
Multiple Races	67%	0%	0%	0%	0%	4%	0%	0%	2%	0%	26%
Native American	67%	0%	0%	0%	0%	4%	0%	0%	2%	0%	26%
Unreported Race	67%	0%	0%	0%	0%	4%	0%	0%	2%	0%	26%
Does not meet	37%	0%	0%	0%	2%	1%	0%	0%	3%	0%	57%
Prior NF Use	75%	0%	0%	0%	0%	7%	0%	0%	1%	0%	16%
Prior HCBS Use	59%	1%	1%	0%	0%	12%	1%	1%	4%	0%	22%
Dementia	67%	0%	0%	0%	0%	4%	0%	0%	2%	0%	26%
ADL Need Low	67%	0%	0%	0%	0%	4%	0%	0%	2%	0%	26%
ADL Need High	67%	0%	0%	0%	0%	4%	0%	0%	2%	0%	26%

Div/Sep/Single = Divorced or Separated or Single Never Married. NFLOC = Nursing Facility Level of Care, NF = Nursing Facility, HCBS = Home and Community Based Care, ADL = Activity of Daily Living. Baseline: Age 65-74, Married, Meets NFLOC, Twin Cities, Male, White (non-Hispanic), no Prior NF or HCBS use, pre-Pandemic period. Variables not included in the model to avoid estimation errors or biased predictions: Dementia, ADL.

Table 6A.17 Multinomial Models: Marginal Transition Probabilities from Non-Medicaid Non-LTSS

Variable	DECEASED	EWC	EWR	MA NF 0-29	MA NF 30-90	MA NF 91+	MA Non- LTSS	NON- MA AC	Non- MA NF 0-29	NON- MA NF 30-90	NON-MA NON- LTSS
Baseline	23%	11%	6%	2%	0%	0%	14%	0%	7%	31%	5%
Age 74-84	27%	8%	11%	2%	0%	0%	10%	0%	6%	31%	5%
Age 85+	33%	5%	13%	2%	0%	0%	7%	0%	4%	29%	6%
Div/Sep/Single/Oth	7%	11%	17%	3%	0%	0%	27%	0%	20%	11%	2%
Widowed	14%	10%	19%	3%	0%	0%	22%	0%	7%	19%	4%
Other Metro Area	23%	11%	6%	2%	0%	0%	14%	0%	7%	31%	5%
Outlying Areas	23%	11%	6%	2%	0%	0%	14%	0%	7%	31%	5%
Rural	23%	11%	6%	2%	0%	0%	14%	0%	7%	31%	5%
Unreported	23%	11%	6%	2%	0%	0%	14%	0%	7%	31%	5%
Female	18%	14%	8%	2%	0%	0%	14%	0%	10%	30%	4%
Asian/Pacific	5%	26%	1%	1%	0%	0%	52%	6%	3%	5%	1%
Black/African	10%	23%	1%	1%	0%	0%	41%	3%	8%	11%	2%
Hispanic	10%	21%	4%	1%	0%	0%	40%	1%	8%	12%	1%
Multiple Races	13%	28%	7%	2%	0%	0%	22%	2%	7%	17%	2%
Native American	12%	21%	4%	2%	1%	0%	32%	3%	6%	16%	2%
Unreported Race	26%	9%	7%	0%	0%	0%	8%	2%	12%	33%	1%
Does not meet	13%	1%	0%	1%	0%	0%	4%	0%	1%	75%	4%
Prior NF Use	32%	5%	5%	2%	1%	0%	11%	0%	4%	26%	12%
Prior HCBS Use	20%	19%	9%	2%	0%	0%	28%	3%	7%	9%	2%
Dementia	23%	11%	6%	2%	0%	0%	14%	0%	7%	31%	5%
ADL Need Low	23%	11%	6%	2%	0%	0%	14%	0%	7%	31%	5%
ADL Need High	23%	11%	6%	2%	0%	0%	14%	0%	7%	31%	5%

Div/Sep/Single = Divorced or Separated or Single Never Married. NFLOC = Nursing Facility Level of Care, NF = Nursing Facility, HCBS = Home and Community Based Care, ADL = Activity of Daily Living. Baseline: Age 65-74, Married, Meets NFLOC, Twin Cities, Male, White (non-Hispanic), no Prior NF or HCBS use, medium ADL need for assistance, no dementia diagnosis, pre-Pandemic period. Variables not included in the model to avoid estimation errors or biased predictions: Location group, dementia, ADL assistance need.

Uncertainty in Survival and Mortality Rates

Figure 6A.4 through Figure 6A.11 gives the 5-year survival curves across all scenarios for a give LTSS subgroup with a simulated 95% Confidence Interval. Figure 6A.12 through Figure 6A.14 gives the same information for Medicaid conversion (also across all scenarios). The pooling of scenarios was done because the differences in both mortality and Medicaid conversion were stable across scenarios (very little difference).

Figure 6A.4 Survival Rate over a 60 Month Period for those Beginning in Alternative Care

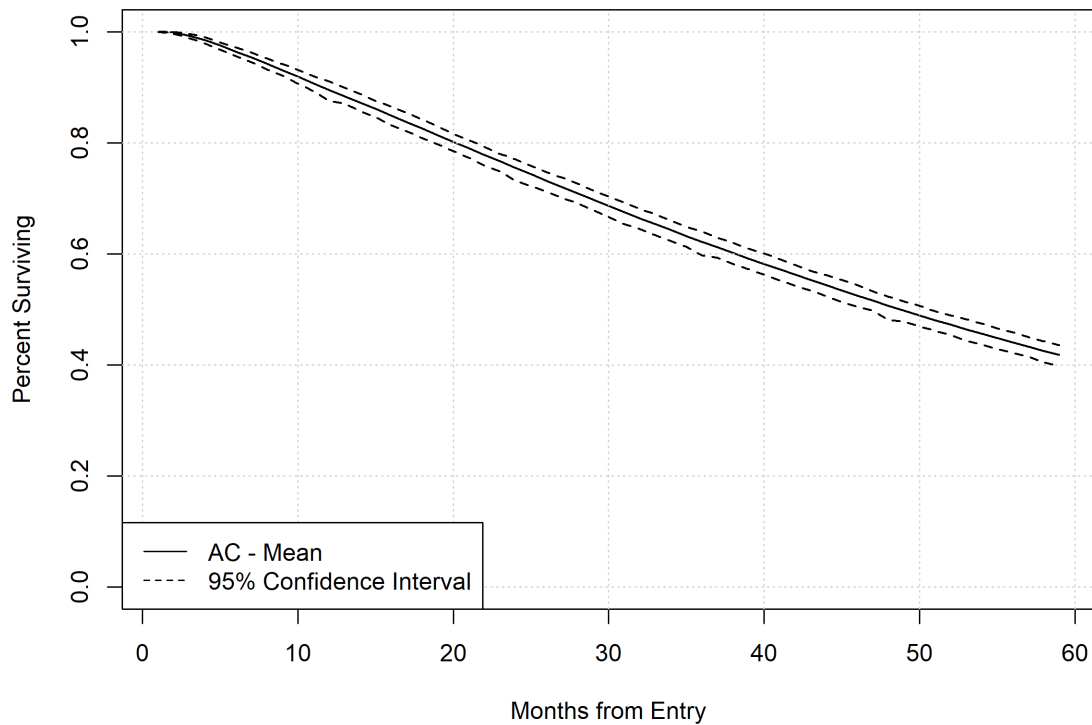


Figure 6A.5 Survival Rate over a 60 Month Period for those Beginning in EW Community

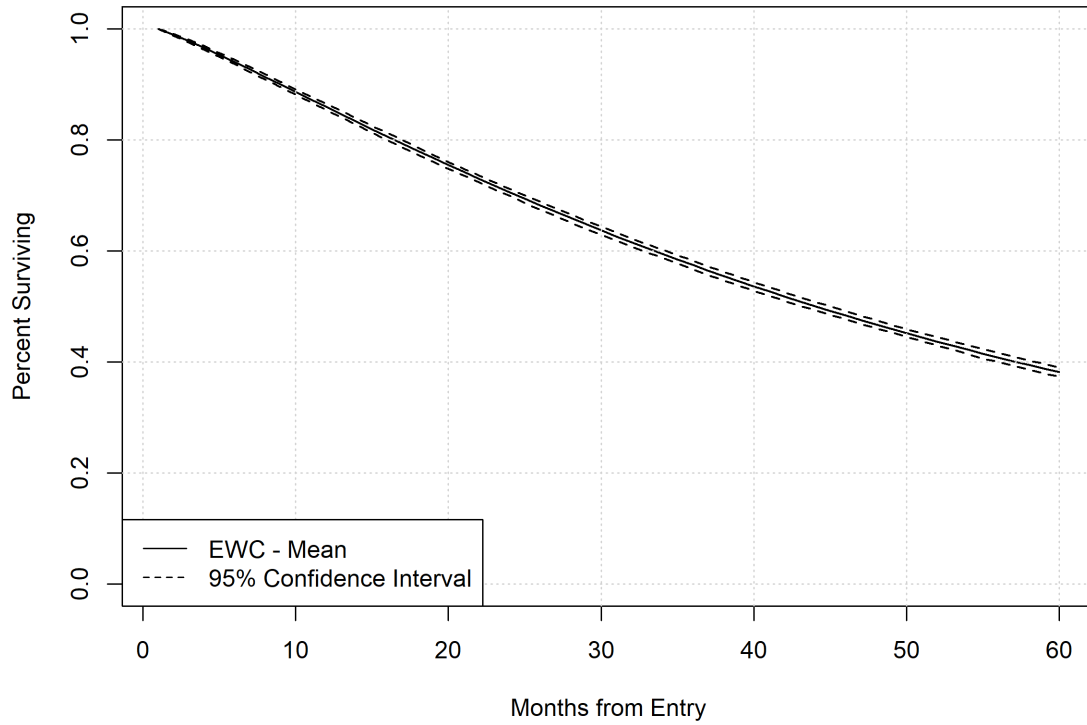


Figure 6A.6 Survival Rate over a 60 Month Period for those Beginning in EW Residential

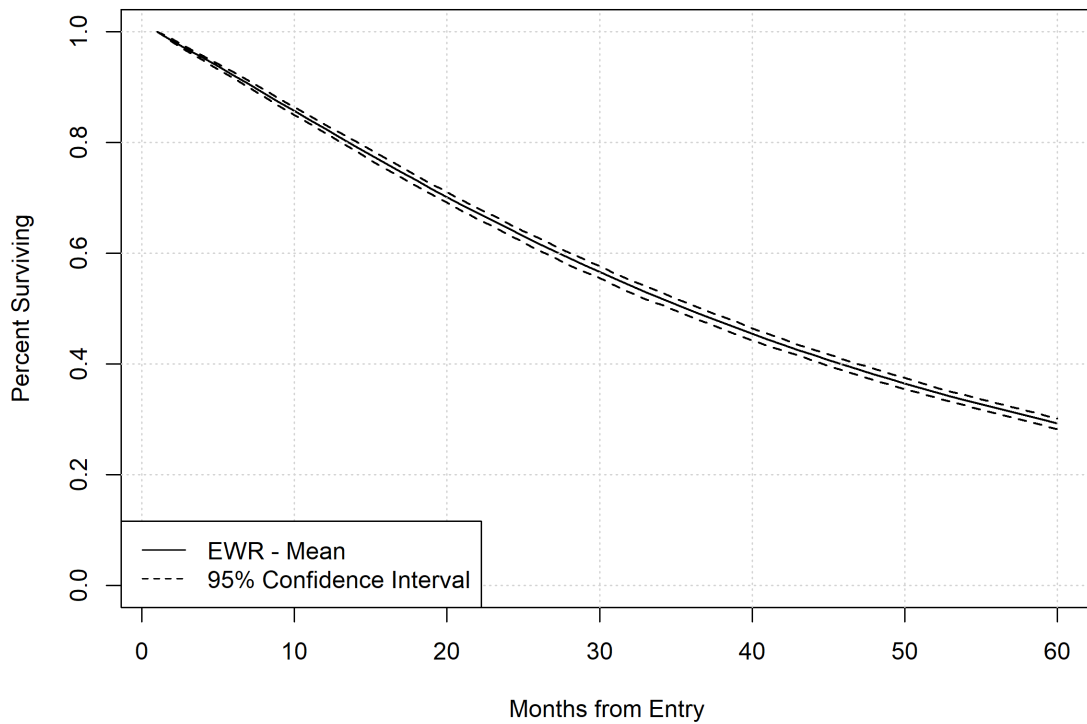


Figure 6A.7 Survival Rate over a 60 Month Period for those Beginning in a Medicaid NF Stay

Survival Rate over a 60 Month Period for those Beginning in a Medicaid NF Stay

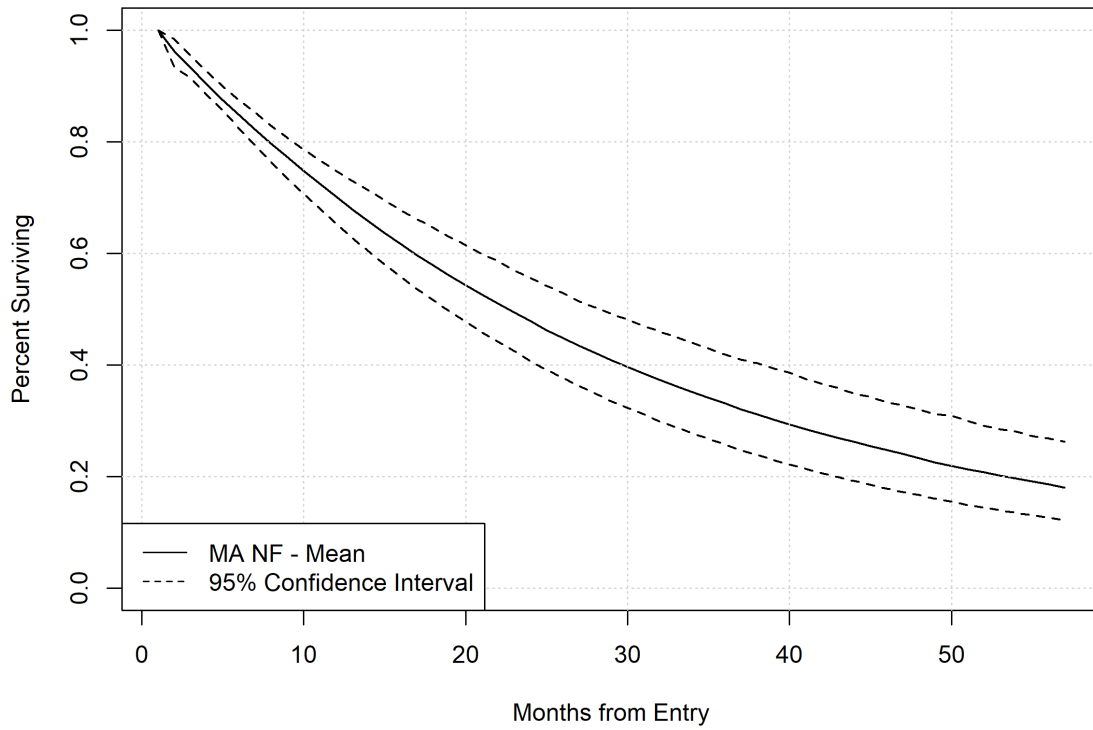


Figure 6A.8 Survival Rate over a 60 Month Period for those Beginning Enrolled in Medicaid with no LTSS

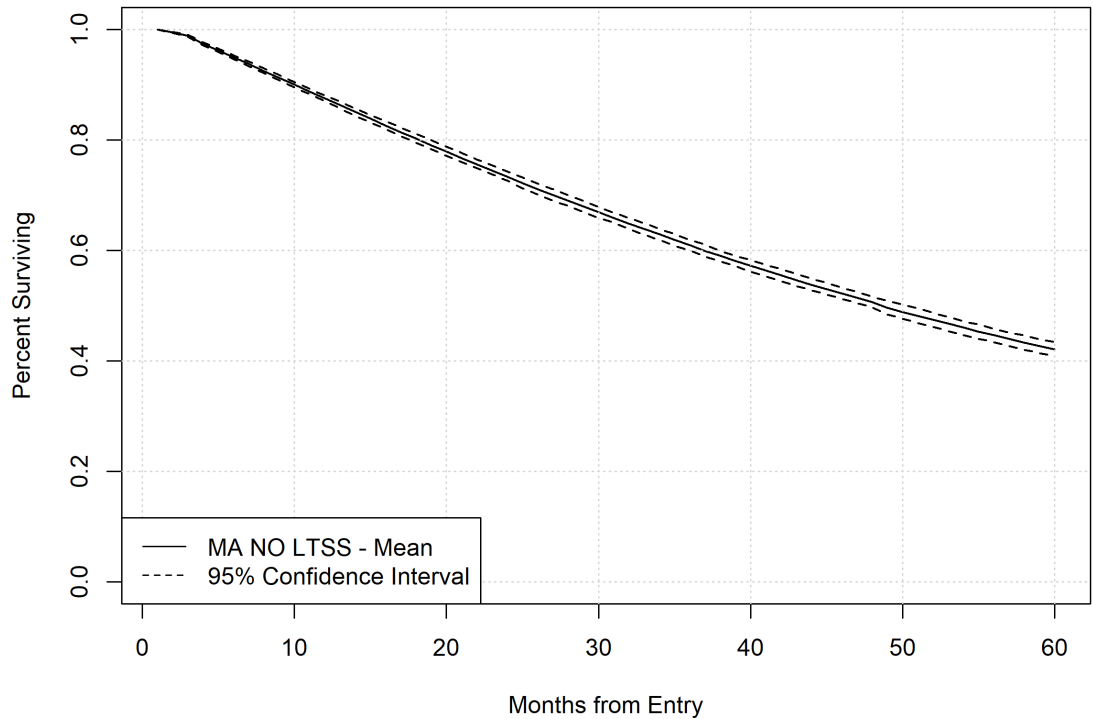


Figure 6A.9 Survival Rate over a 60 Month Period for those Beginning in a NF without MA

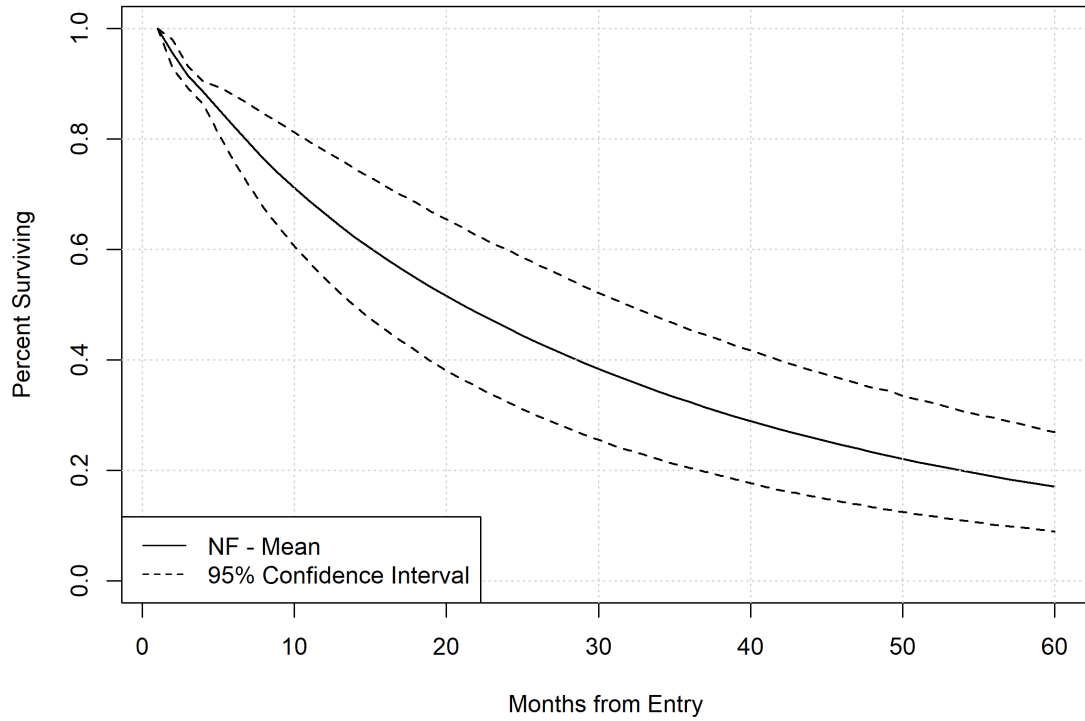


Figure 6A.10 Survival Rate over a 60 Month Period for those Beginning without MA or LTSS

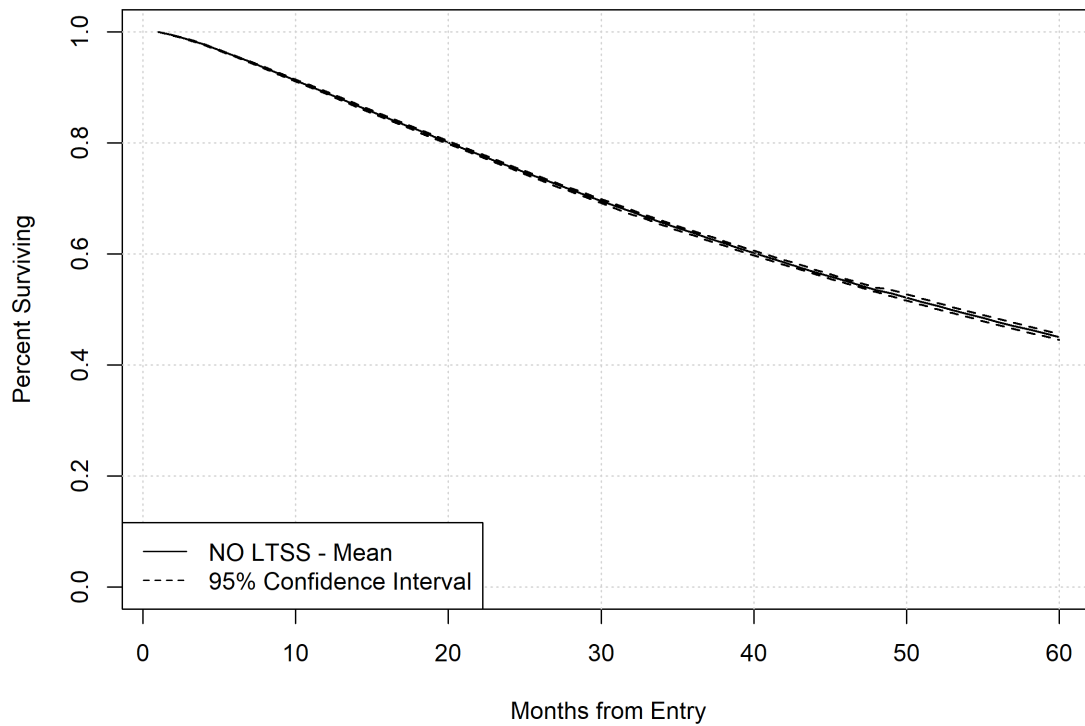


Figure 6A.11 Survival Rate over a 60 Month Period for those Beginning with PCA and not enrolled in a Waiver Program

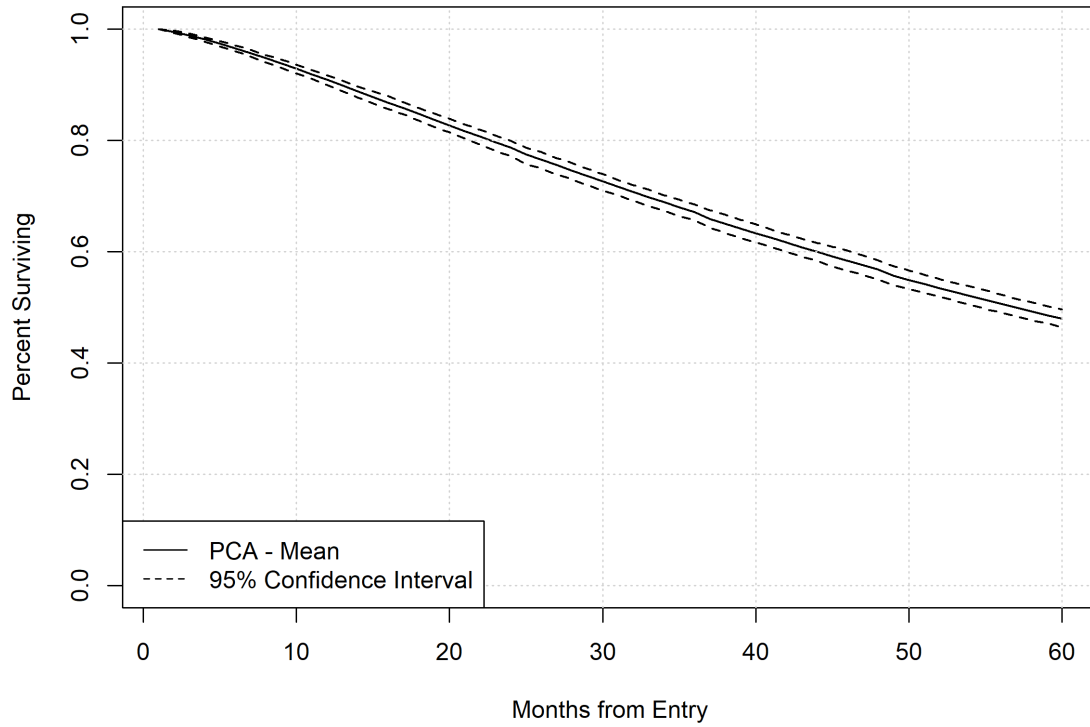


Figure 6A.12 Medicaid Conversion Rate over 60 Months for those Beginning in Alternative Care

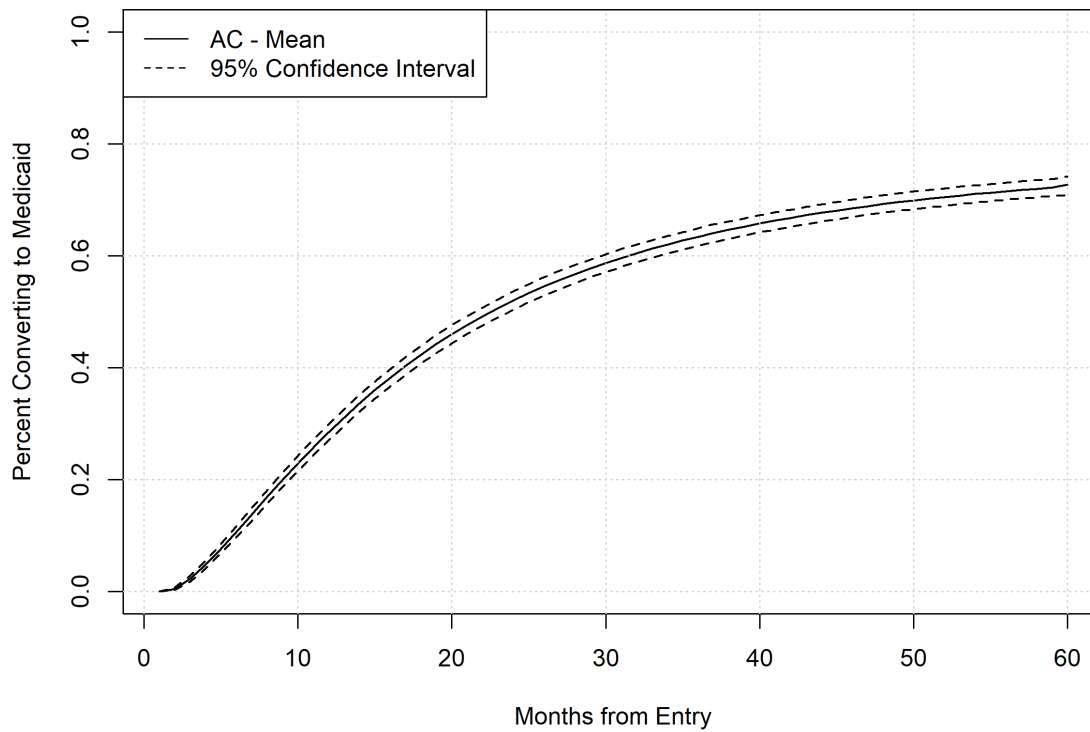


Figure 6A.13 Medicaid Conversion Rate over 60 Months for those Beginning in a NF

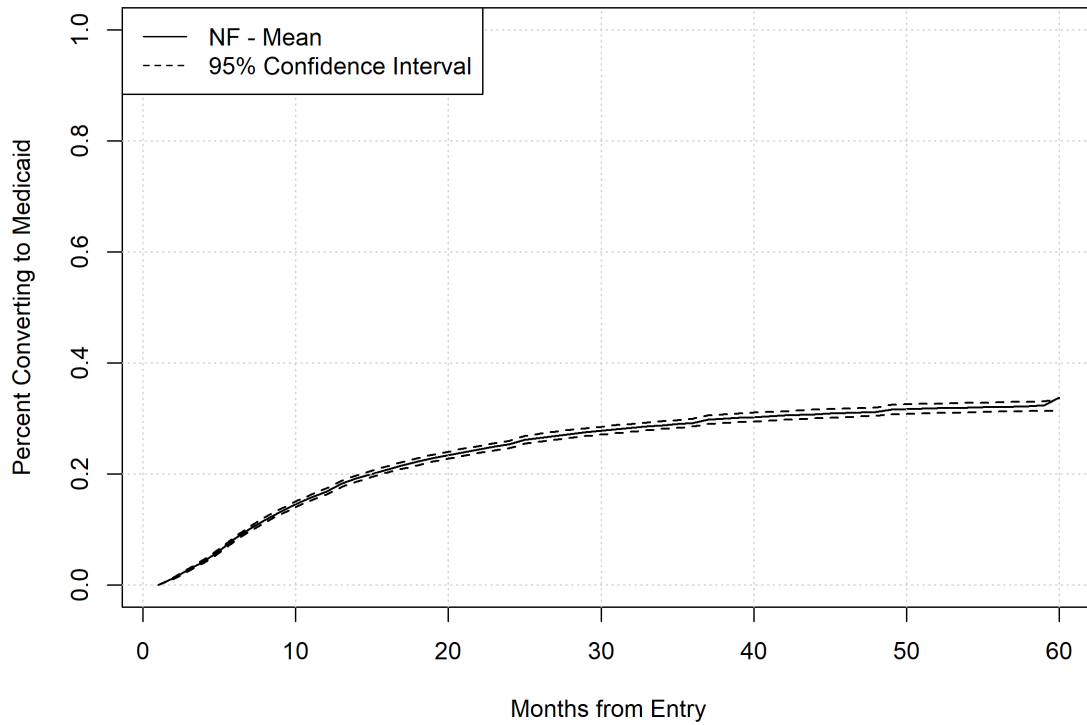


Figure 6A.14 Medicaid Conversion Rate over 60 Months for those Beginning without MA or LTSS

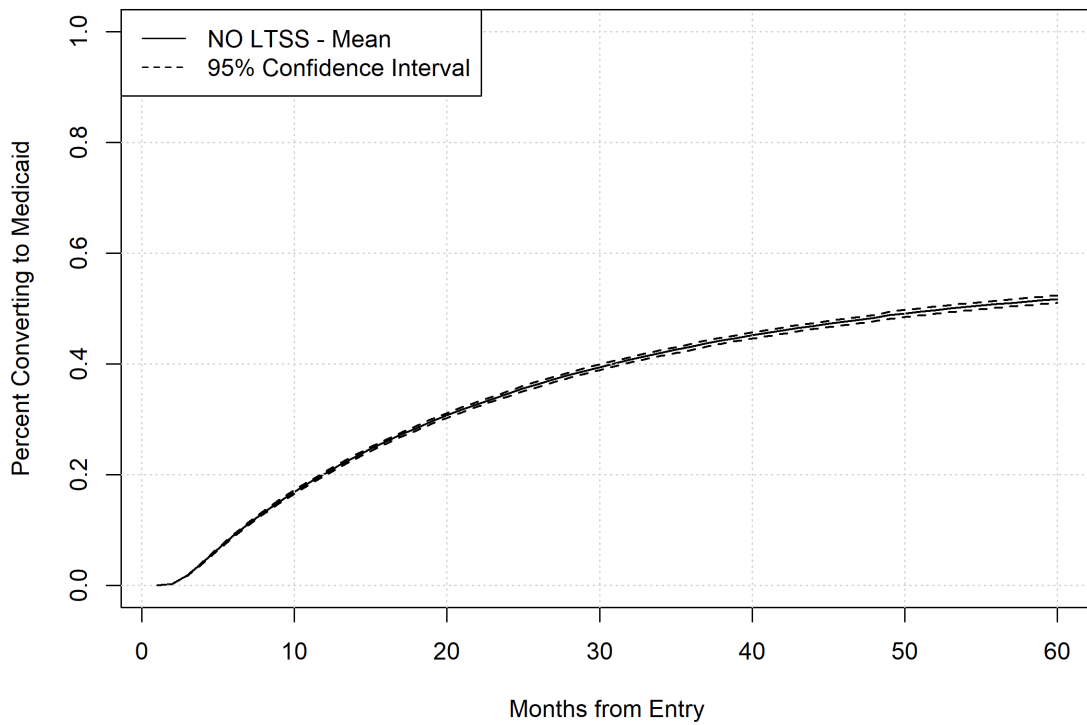


Table 6A.18 Simulated 95% Confidence Intervals for Average Monthly Total Person Months of LTSS by Subgroup, Scenario, and Cohort

	Scenario	2025 Cohort		2030 Cohort		2035 Cohort	
		Lower Bound	Upper Bound	Lower Bound	Upper Bound	Lower Bound	Upper Bound
EW Community	Baseline	17,658	17,902	19,625	19,872	20,730	21,021
EW Residential	Baseline	14,256	14,511	15,914	16,149	17,308	17,578
MA NF	Baseline	15,684	15,954	17,407	17,666	18,989	19,296
PCA	Baseline	3,989	4,133	4,358	4,506	4,483	4,623
AC	Baseline	4,587	4,718	5,123	5,272	5,577	5,733
Non-MA NF	Baseline	7,987	8,112	8,941	9,065	9,977	10,103
EW Community	COVID	12,925	13,133	14,135	14,365	13,994	14,239
EW Residential	COVID	10,479	10,706	11,530	11,765	11,777	11,994
MA NF	COVID	10,653	10,891	11,649	11,861	11,896	12,104
PCA	COVID	2,982	3,100	3,198	3,324	3,067	3,185
AC	COVID	3,270	3,383	3,595	3,721	3,652	3,773
Non-MA NF	COVID	5,727	5,832	6,305	6,414	6,584	6,691
EW Community	NF Shift	18,201	18,479	20,222	20,517	21,425	21,714
EW Residential	NF Shift	14,830	15,072	16,519	16,789	17,996	18,287
MA NF	NF Shift	15,069	15,316	16,679	16,954	18,187	18,513
PCA	NF Shift	4,216	4,340	4,592	4,732	4,722	4,862
AC	NF Shift	4,605	4,750	5,154	5,302	5,606	5,763
Non-MA NF	NF Shift	8,064	8,182	9,032	9,150	10,082	10,212

**Table 6A.19 Simulated 95% Confidence Intervals for annual Mean Payment*
Amounts by LTSS Subgroup, Scenario, and Cohort (Million Dollars)**

	Scenario	2025 Cohort		2030 Cohort		2035 Cohort	
		Lower Bound	Upper Bound	Lower Bound	Upper Bound	Lower Bound	Upper Bound
EW Community	Baseline	510	517	642	650	767	778
EW Residential	Baseline	582	592	735	746	904	918
MA NF	Baseline	1498	1524	1881	1909	2320	2358
PCA	Baseline	204	211	252	260	293	302
AC	Baseline	64	66	81	83	100	102
Non-MA NF	Baseline	1	1	1	1	2	2
EW Community	COVID	373	379	462	469	517	526
EW Residential	COVID	427	437	532	543	615	626
MA NF	COVID	1019	1042	1260	1284	1455	1481
PCA	COVID	152	158	185	192	200	208
AC	COVID	46	47	57	59	65	67
Non-MA NF	COVID	1	1	1	1	1	1
EW Community	NF Shift	526	534	661	670	792	803
EW Residential	NF Shift	605	615	762	775	940	955
MA NF	NF Shift	1441	1465	1805	1835	2226	2265
PCA	NF Shift	215	222	265	273	308	318
AC	NF Shift	64	66	81	84	100	103
Non-MA NF	NF Shift	1	1	1	1	2	2

* Medicaid payments for MA services.

Holding Times

In addition to the transitions between groups, the second major component of the model is the length of time an individual remains in a group, sometimes referred to as the holding time. For the semi-Markov model, each transition path between two groups is modeled separately (e.g., given an individual will transition from EWC to EWR, how many months will they remain in EWC until they make the transition). These holding times are modeled using positive right skewed probability distributions. For each path the best fitting distribution of Gamma, Log-Normal, Weibull, Burr (Type 12), and Pareto (Type 2) was chosen using goodness-of-fit criterion. When model fit was not adversely affected, the scale parameters of the distribution were adjusted using a regression model with the same set of independent variables utilized in the multinomial regression models for transition probabilities. All distributions accounted for censoring (individuals remaining in the group until the end of the data period).

Figure 6A.15 through Figure 6A.86 display the holding time distribution for each transition used in the simulation. For each figure, the distribution parameters, median holding time (50th percentile) and probability of remaining in the original subgroup before transitioning to the next subgroup for at least 2 years are given. For example, Figure 6A.15 indicates that for the time to transition between EWC and death was modeled using a Weibull distribution (with shape parameter equal to 0.97 and scale parameter equal to 20.73). Of those in EWC who would remain in EWC until death, 50% remained in EWC for 14.22 months or longer and 3.2% remained in EWC for 2 years or more prior to death.

Figure 6A.15 Holding Times: EWC to Death

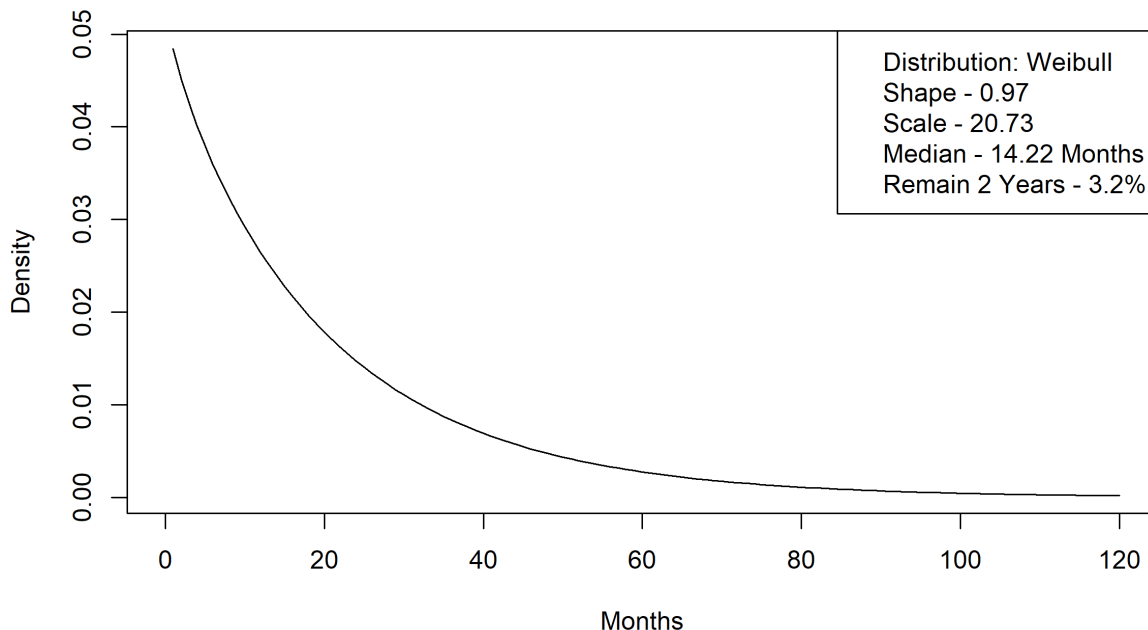


Figure 6A.16 Holding Times: EWC to EWR

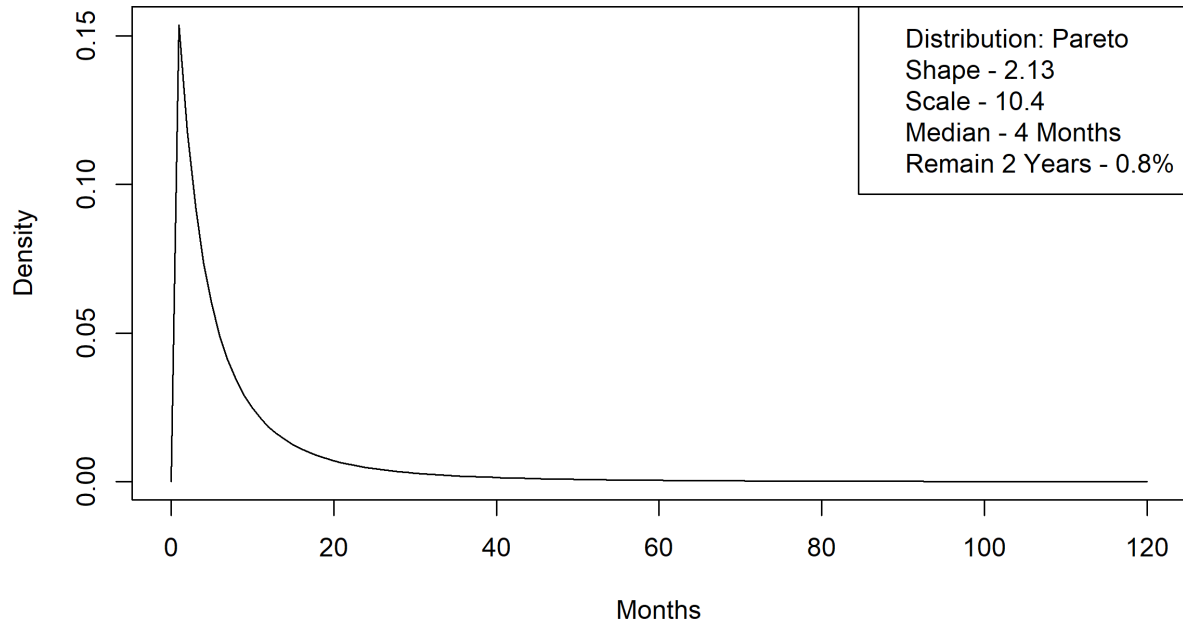


Figure 6A.17 Holding Times: EWC to MA NF 0-29

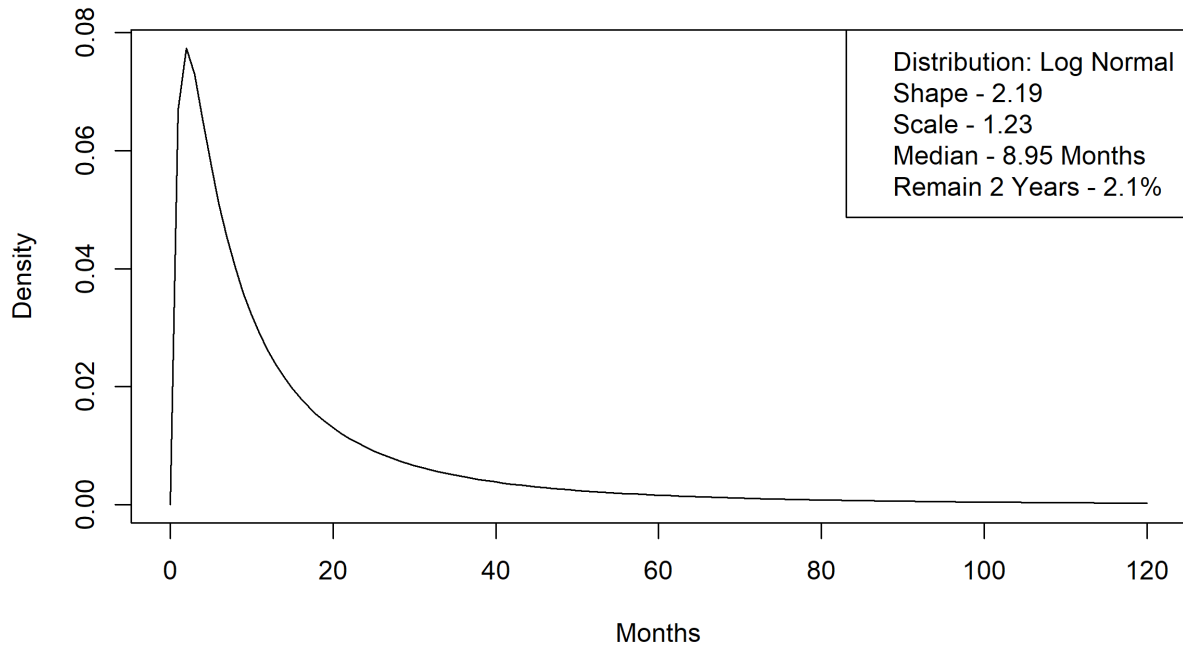


Figure 6A.18 Holding Times: EWC to MA NF 30-90

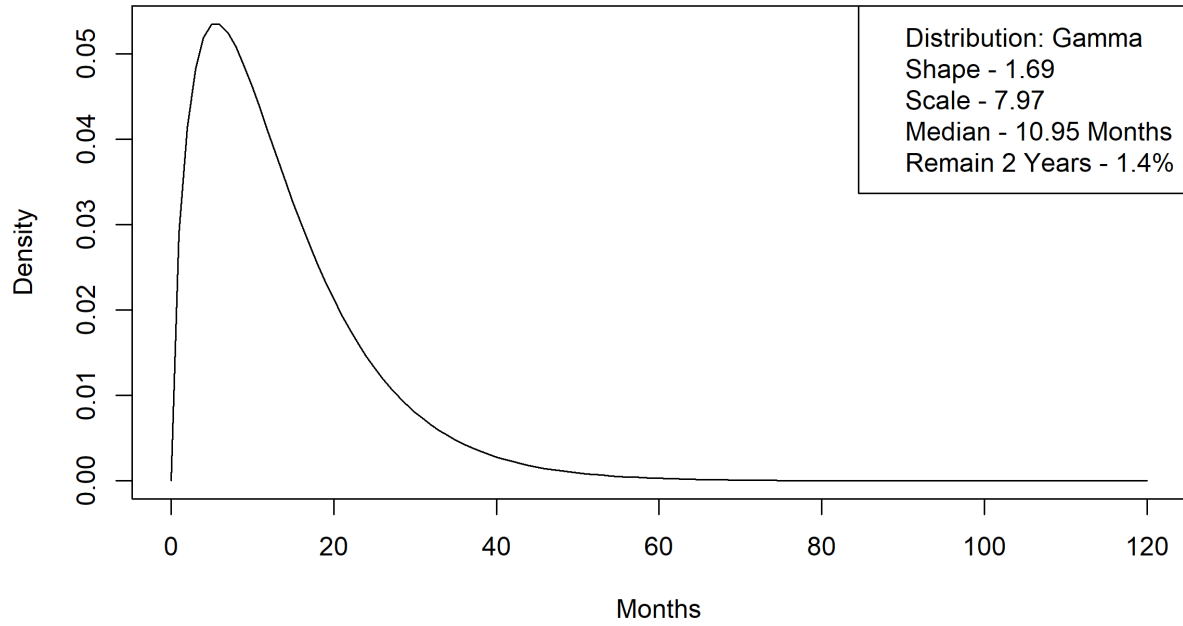


Figure 6A.19 Holding Times: EWC to MA NF 91+

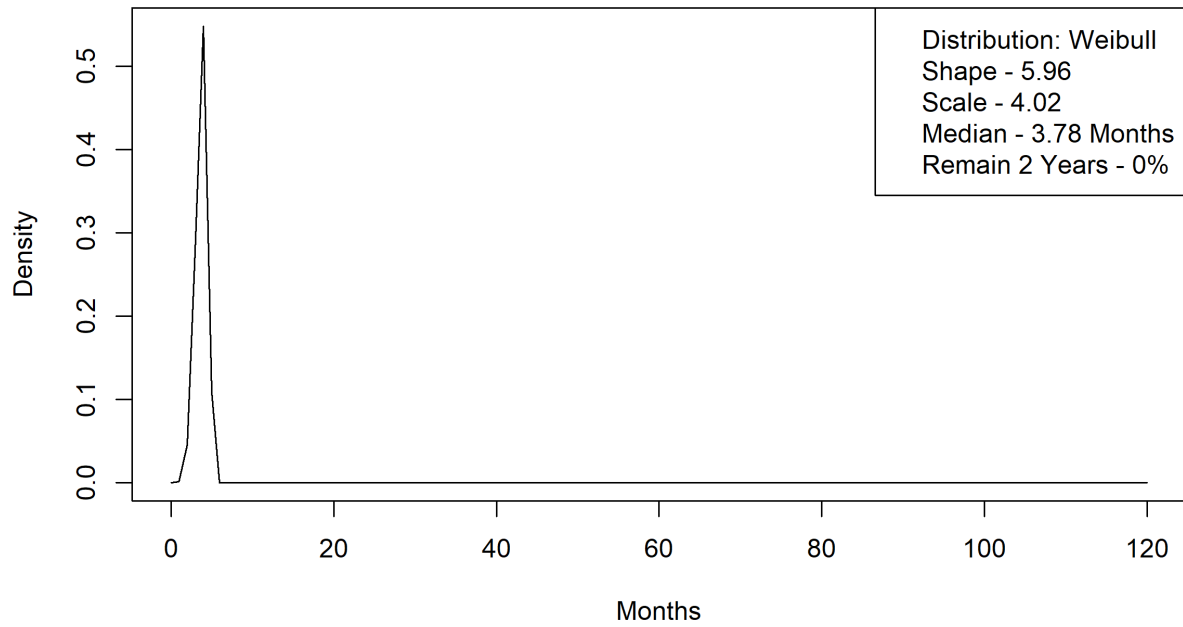


Figure 6A.20 Holding Times: EWC to MA No LTSS

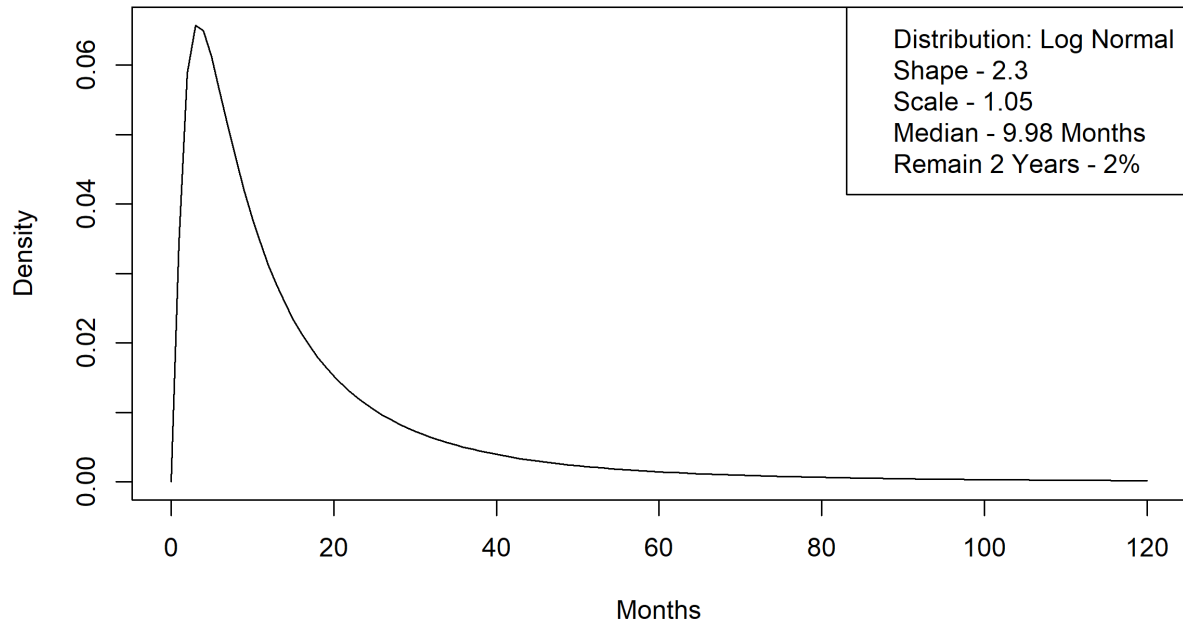


Figure 6A.21 Holding Times: EWC to PCA

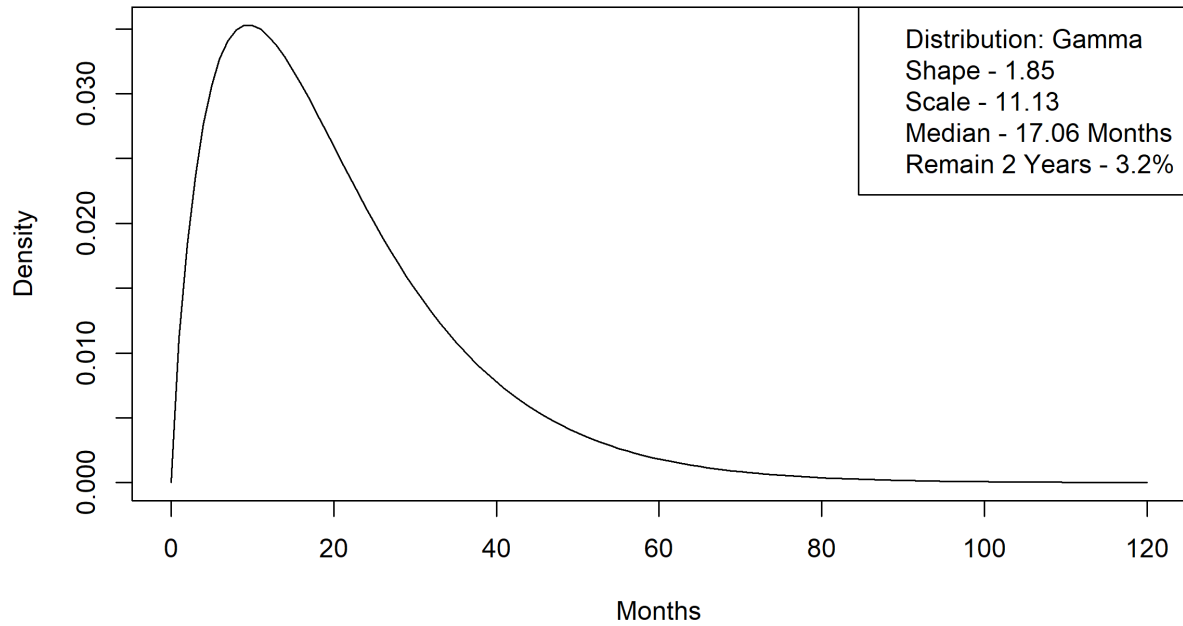


Figure 6A.22 Holding Times: EWC to AC

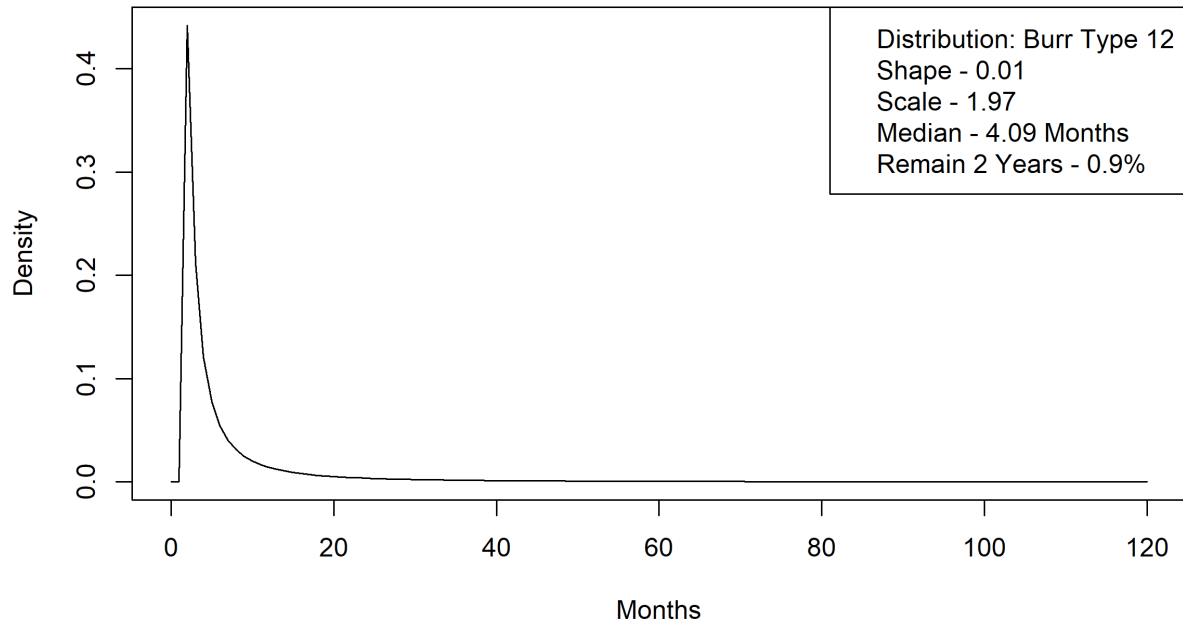


Figure 6A.23 Holding Times: EWC to No LTSS

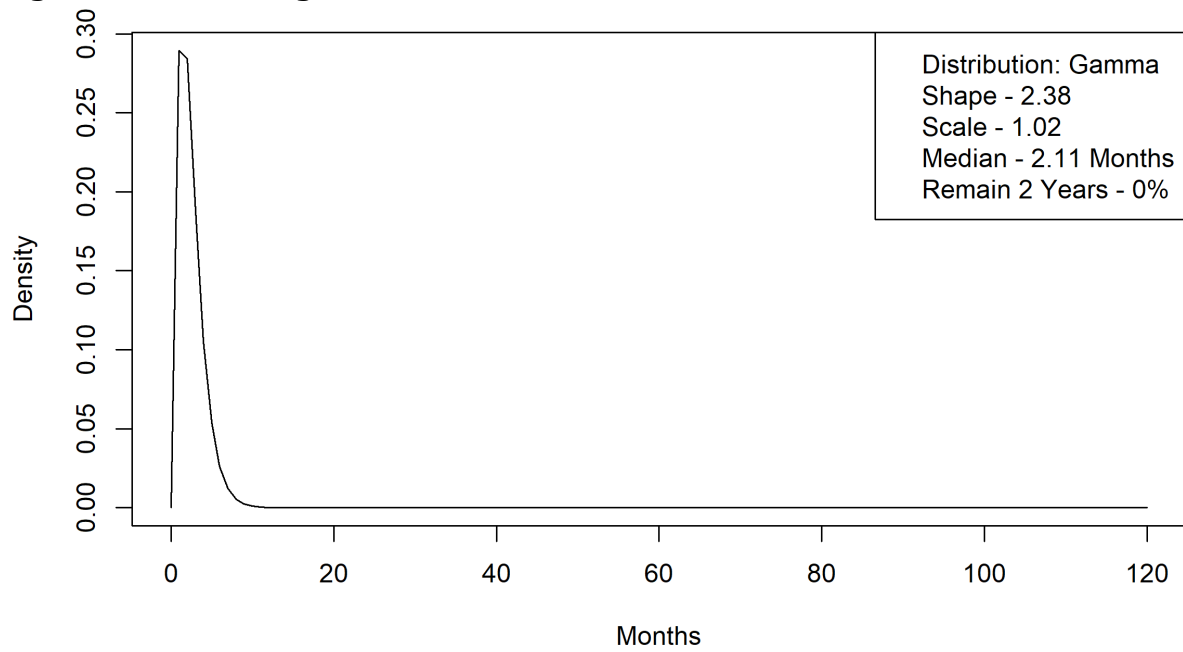


Figure 6A.24 Holding Times: EWR to Death

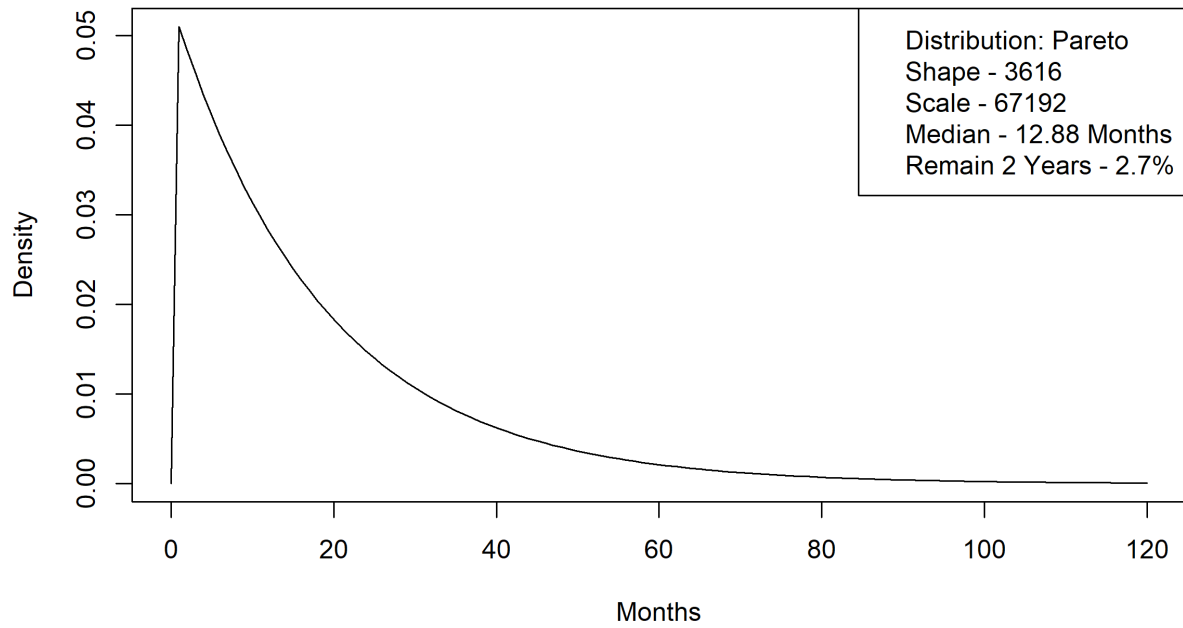


Figure 6A.25 Holding Times: EWR to EWC

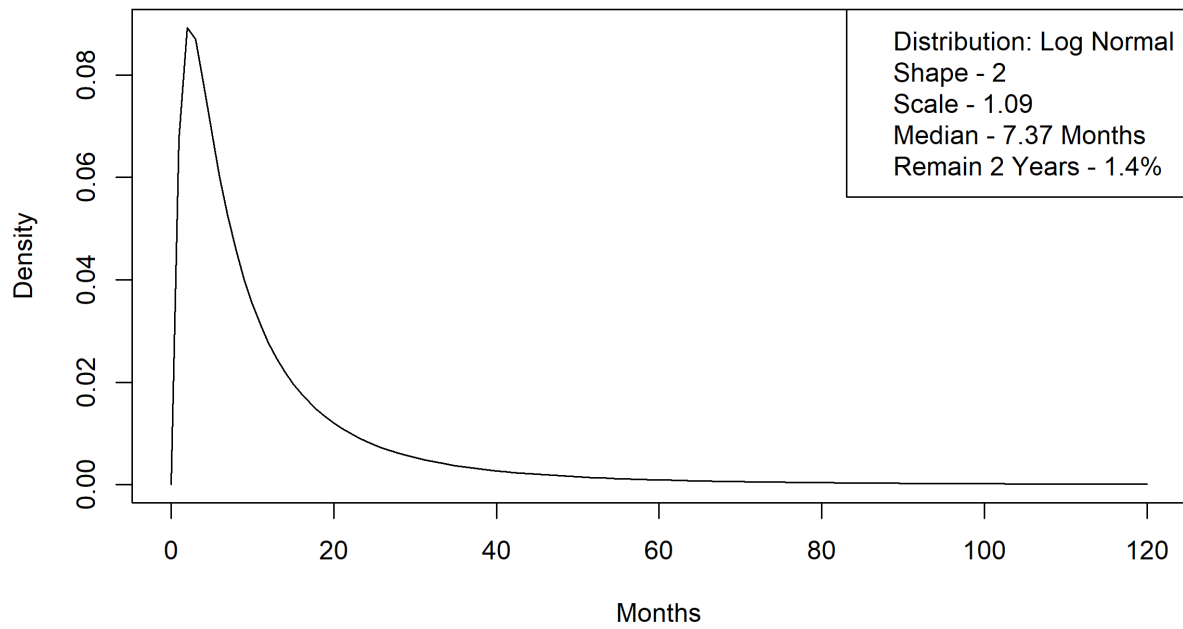


Figure 6A.26 Holding Times: EWR to MA NF 0-29

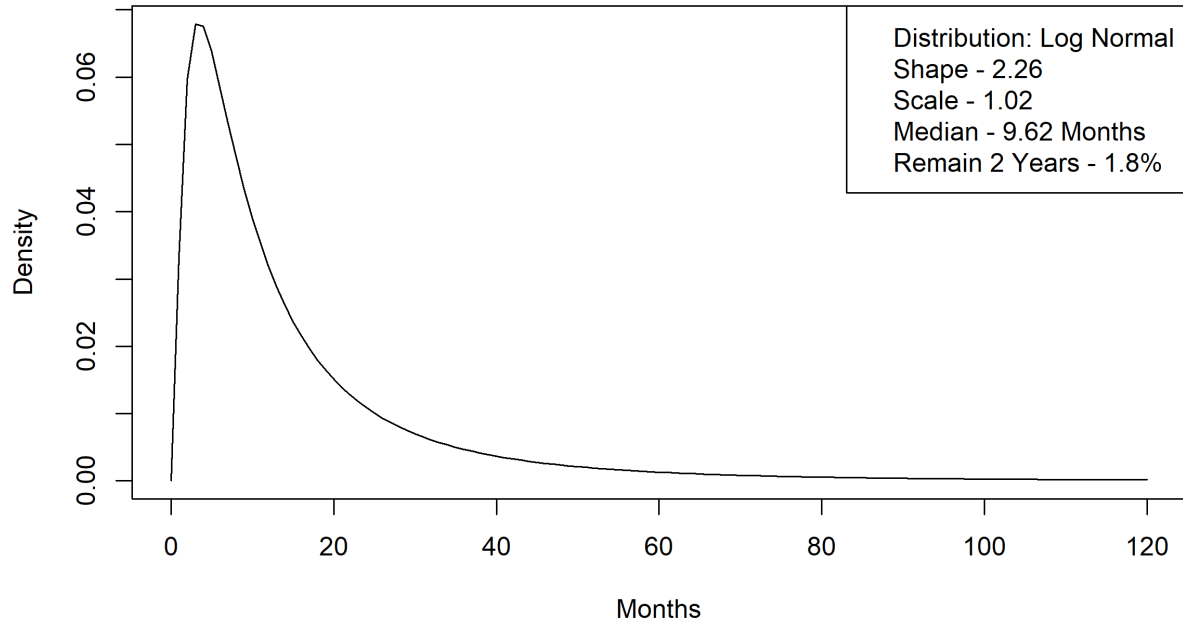


Figure 6A.27 Holding Times: EWR to MA NF 30-90

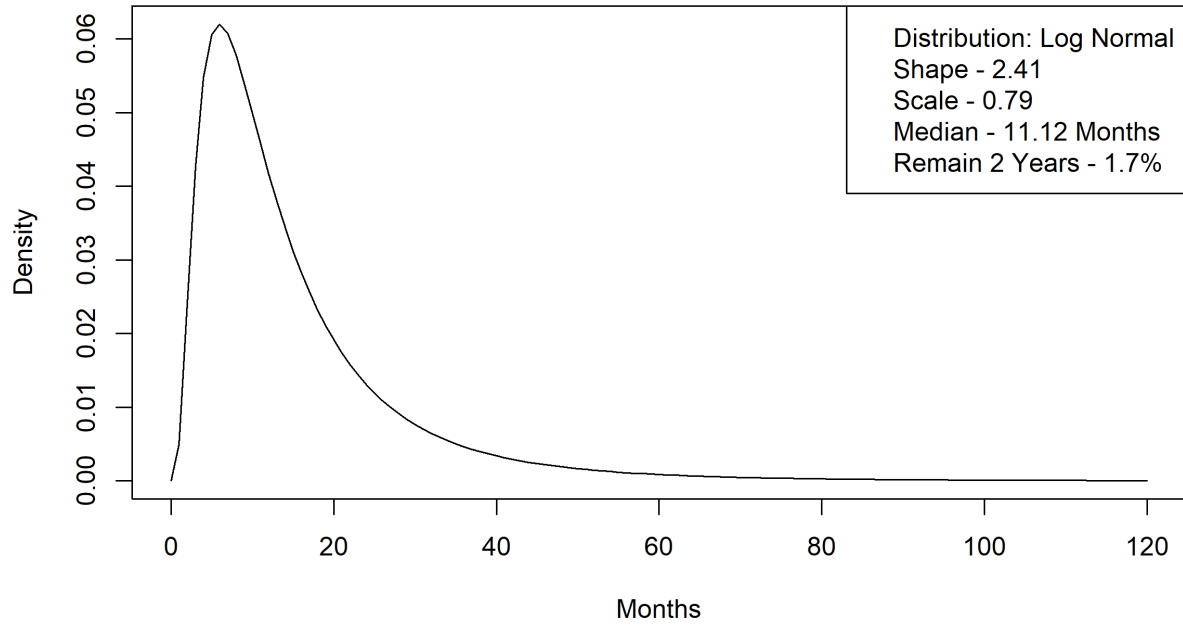


Figure 6A.28 Holding Times: EWR to MA No LTSS

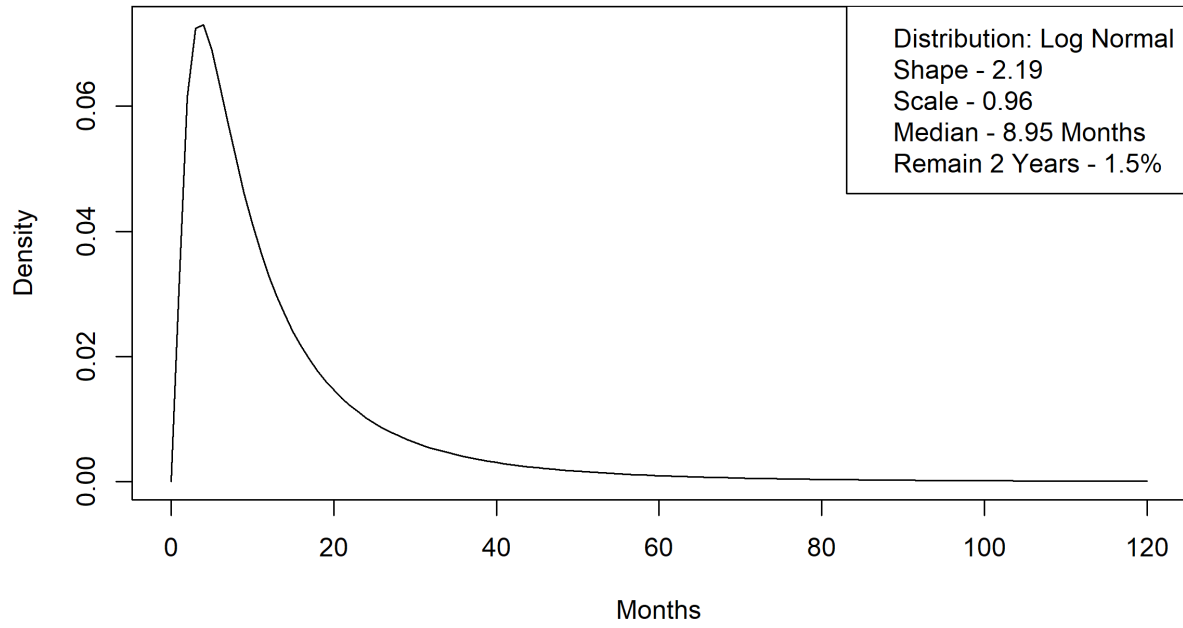


Figure 6A.29 Holding Times: EWR to No LTSS

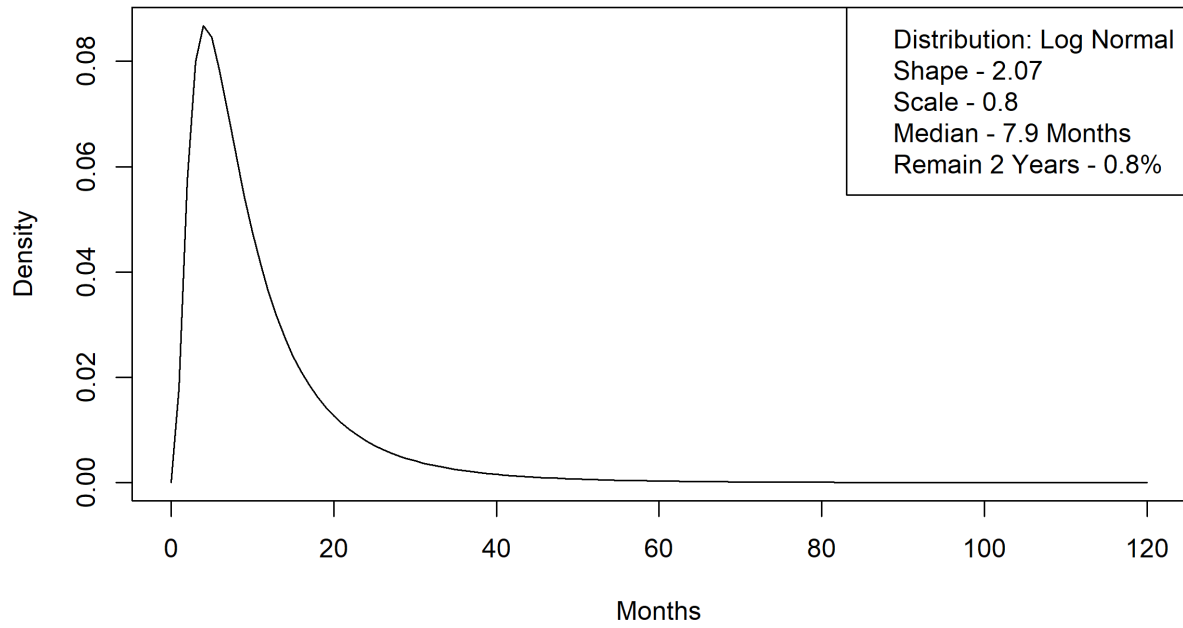


Figure 6A.30 Holding Times: MA NF 91+ to Death

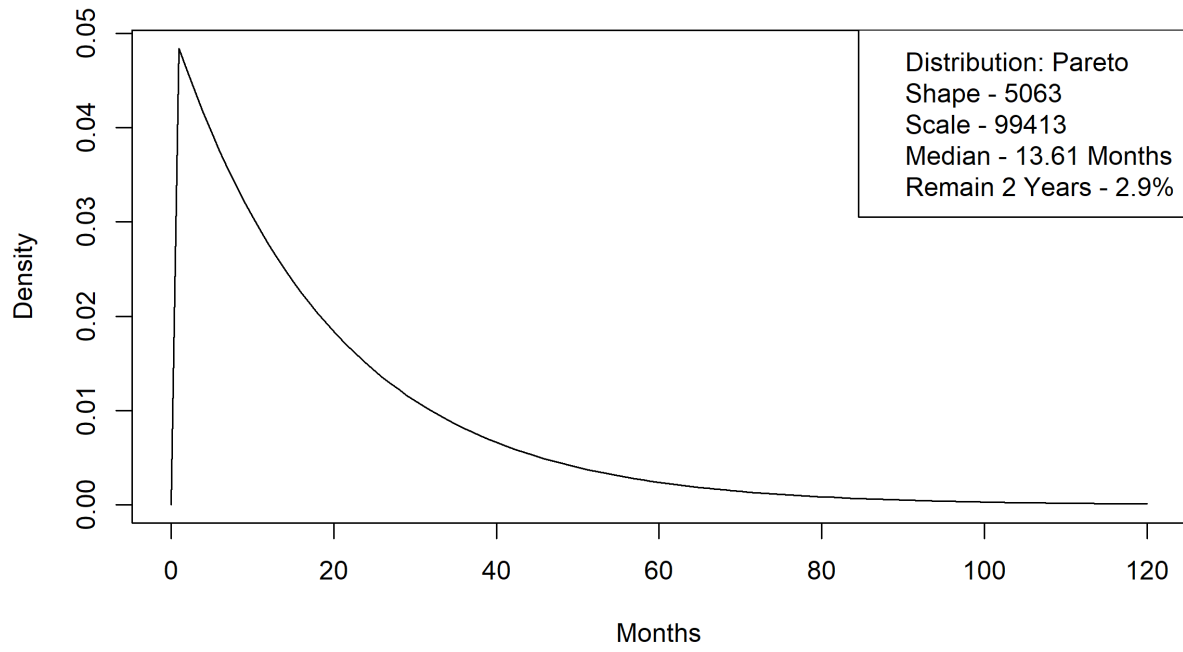


Figure 6A.31 Holding Times: MA NF 91+ to EWC

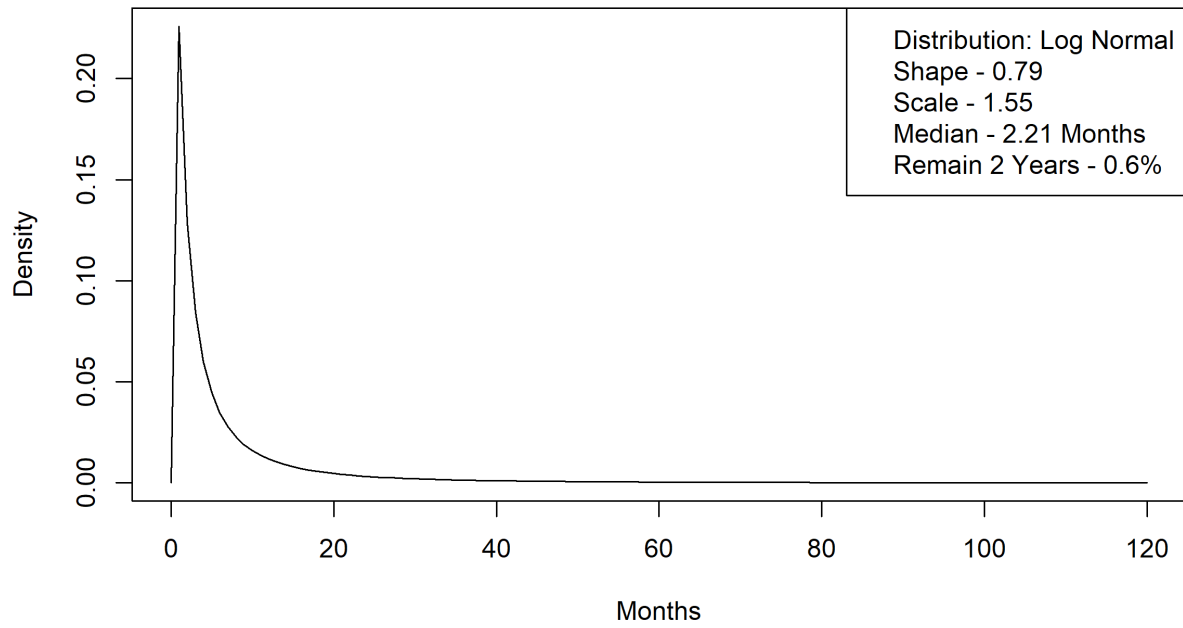


Figure 6A.32 Holding Times: MA NF 91+ to EWR

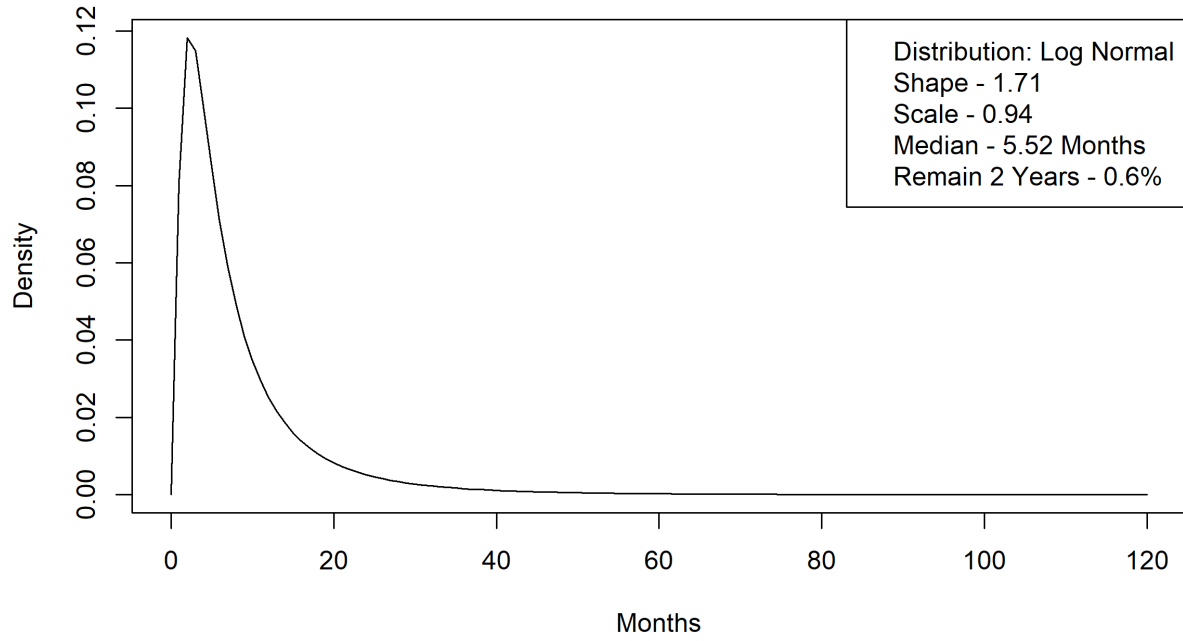


Figure 6A.33 Holding Times: MA NF 91+ to MA NF 0-29

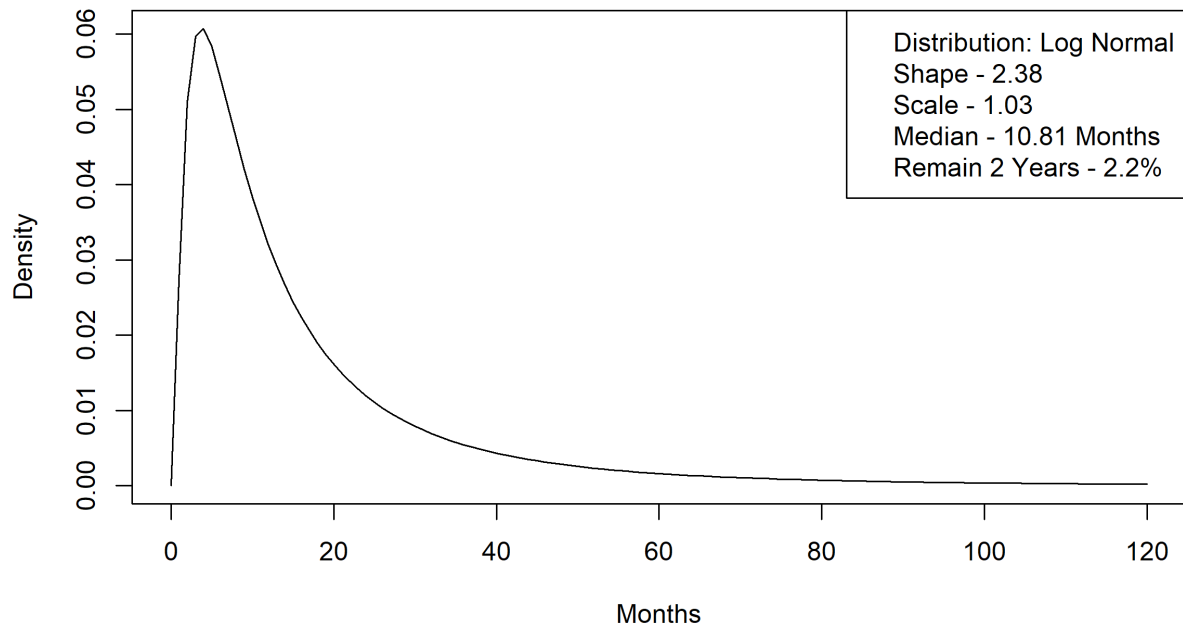


Figure 6A.34 Holding Times: MA NF 91+ to MA No LTSS

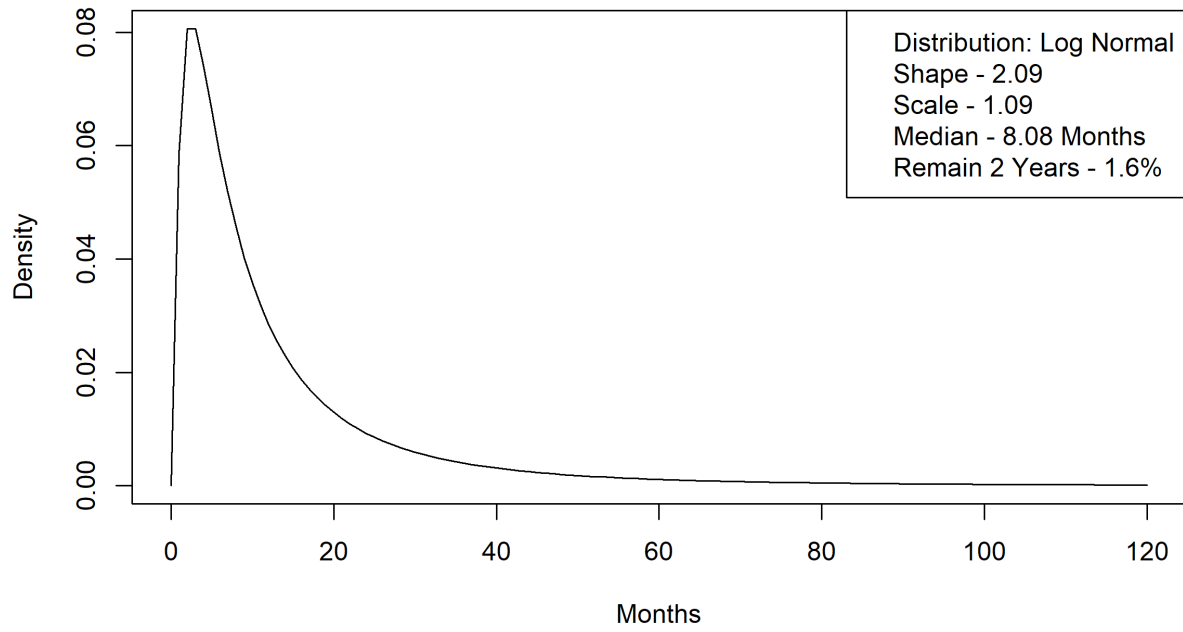


Figure 6A.35 Holding Times: MA NF 91+ to PCA

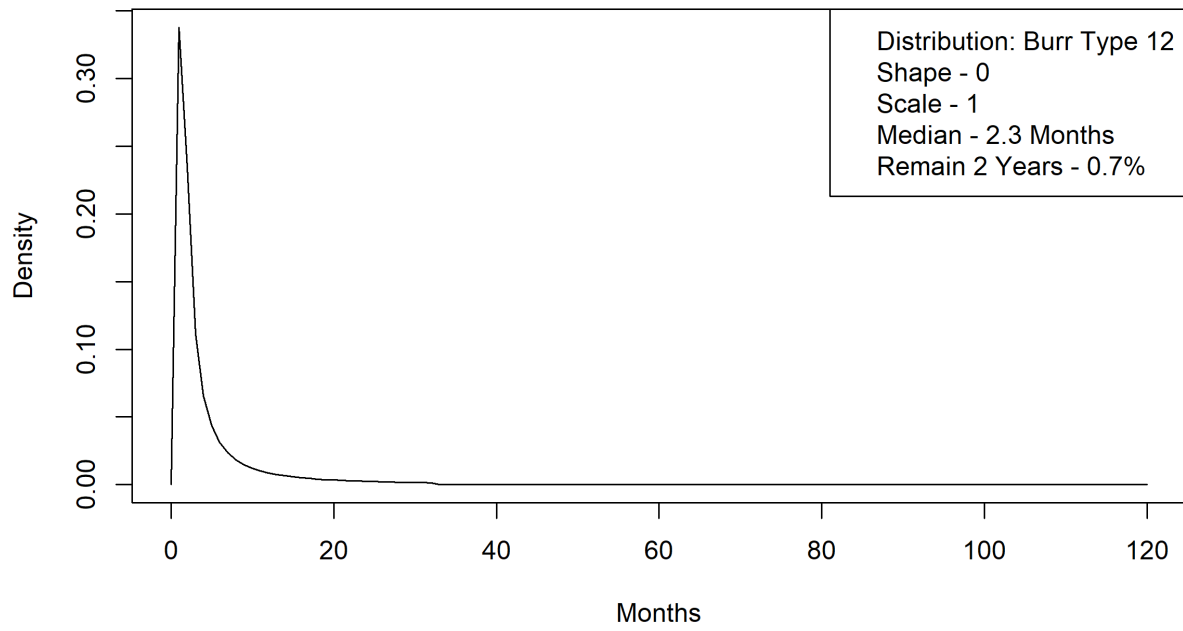


Figure 6A.36 Holding Times: MA NF 91+ to AC

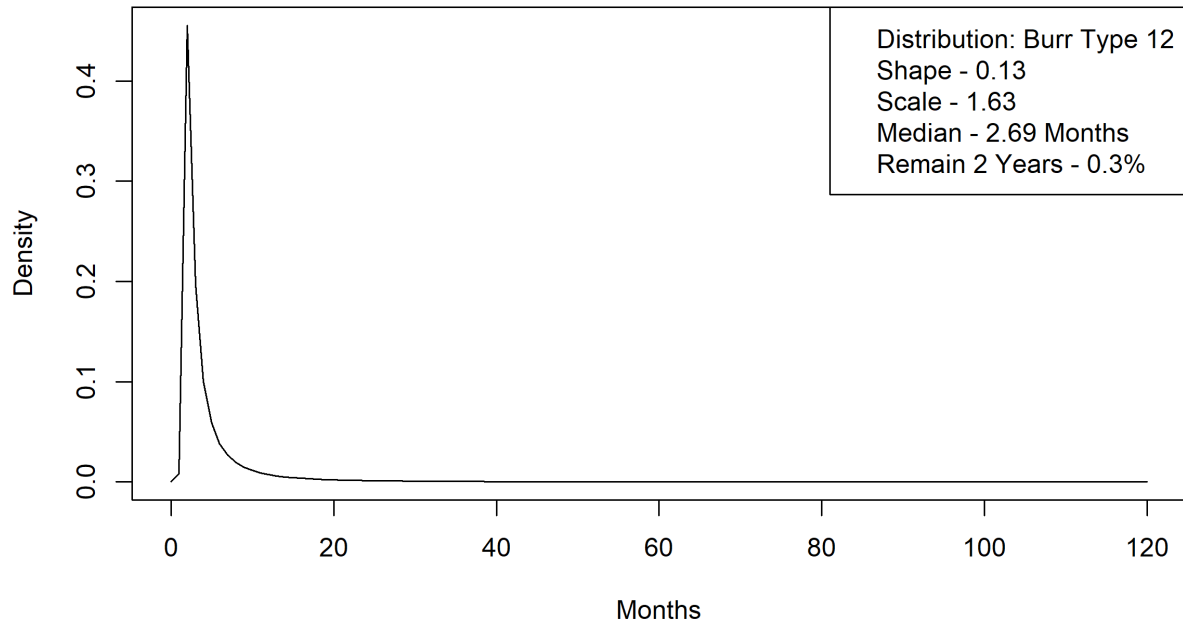


Figure 6A.37 Holding Times: MA NF 91+ to No LTSS

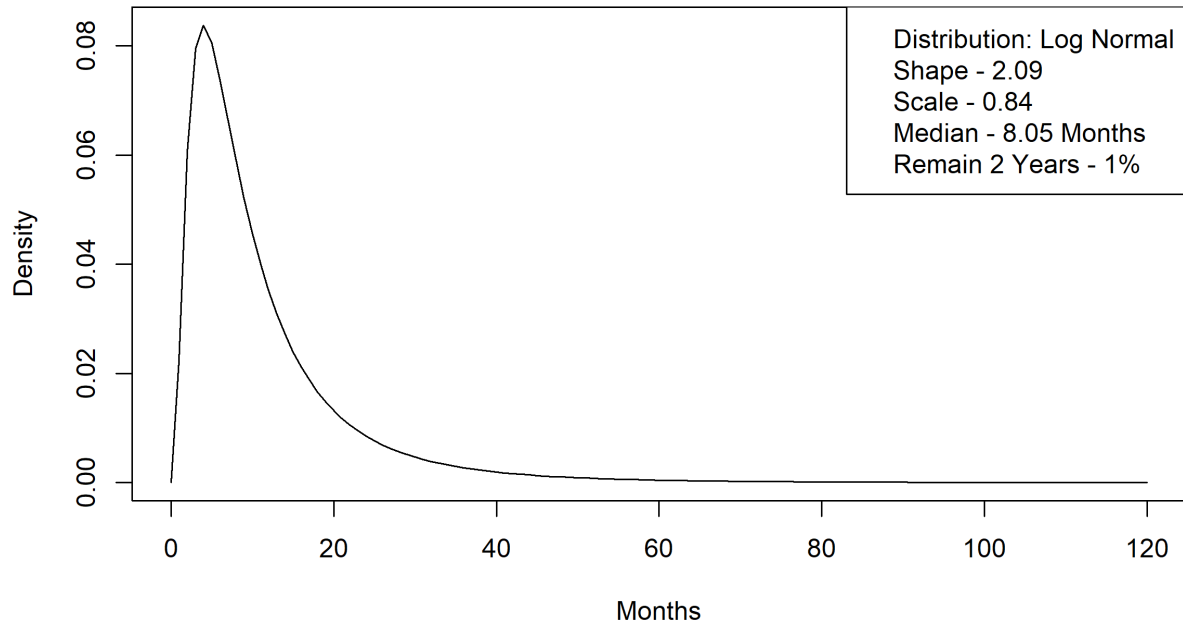


Figure 6A.38 Holding Times: MA No LTSS to Death

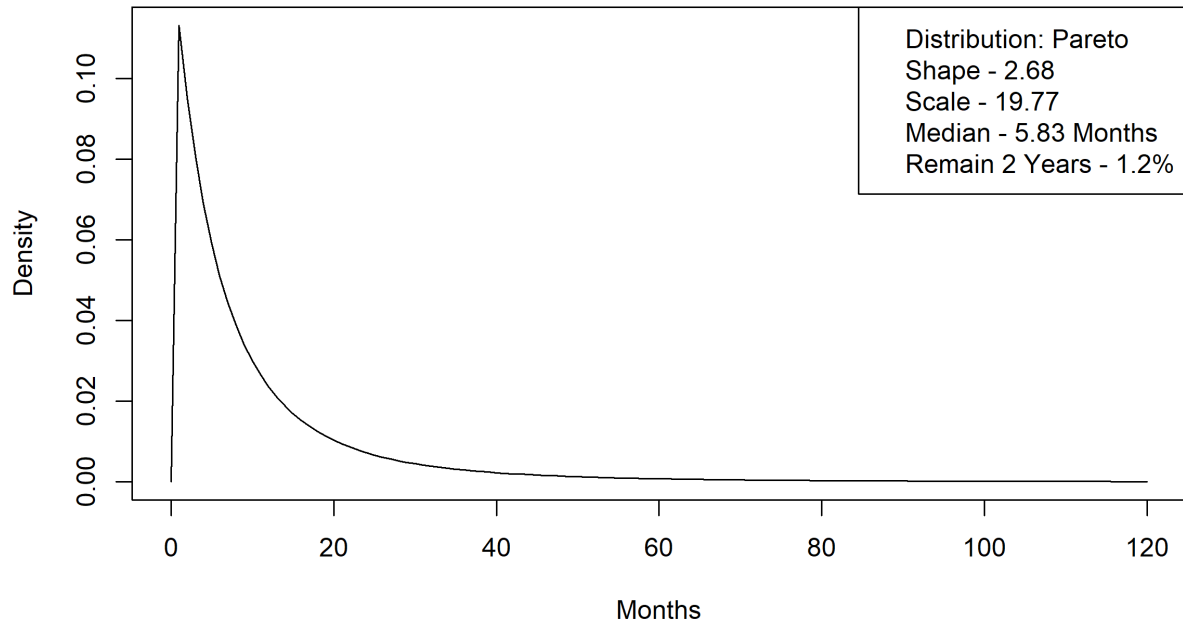


Figure 6A.39 Holding Times: MA No LTSS to EWC

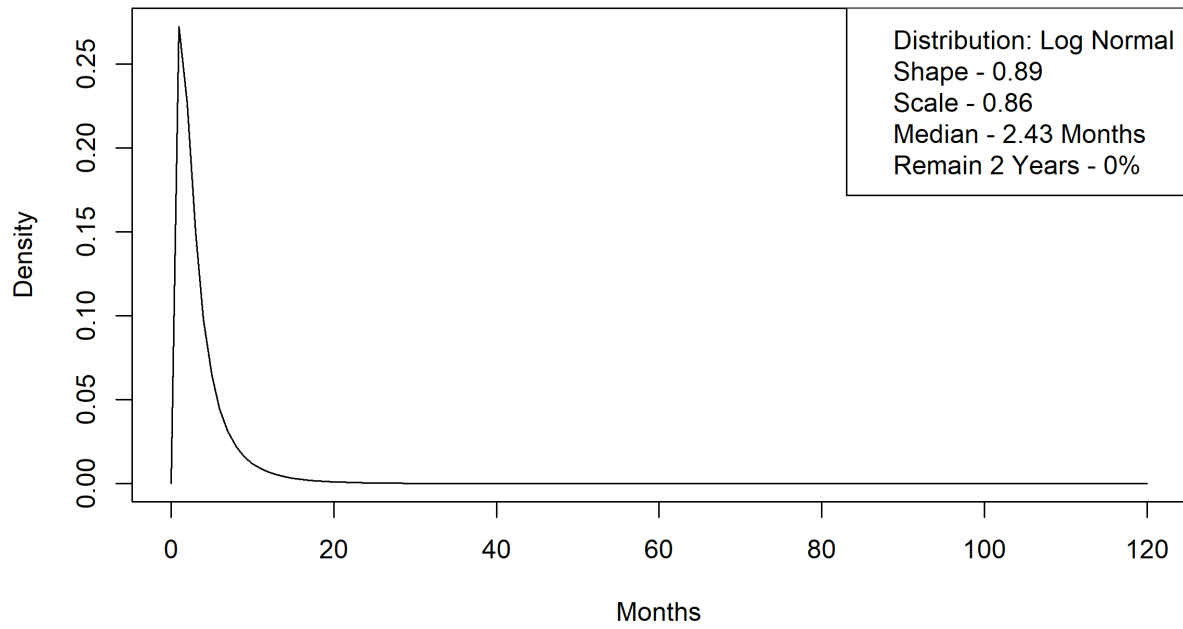


Figure 6A.40 Holding Times: MA No LTSS to EWR

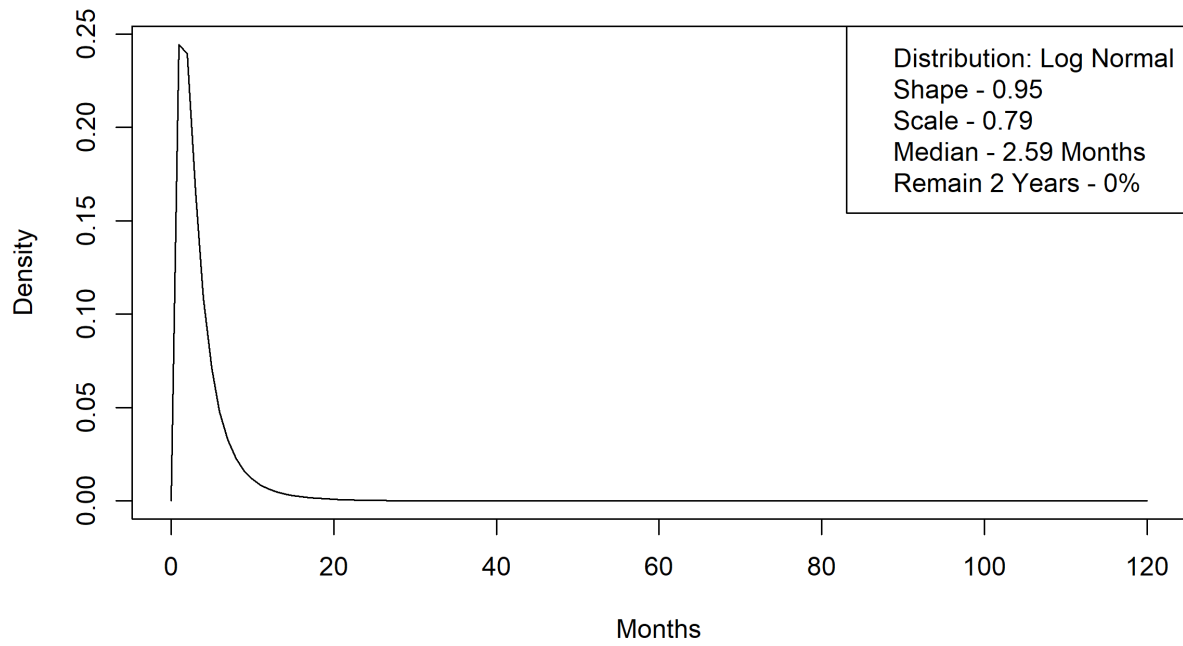


Figure 6A.41 Holding Times: MA No LTSS to MA NF 0-29

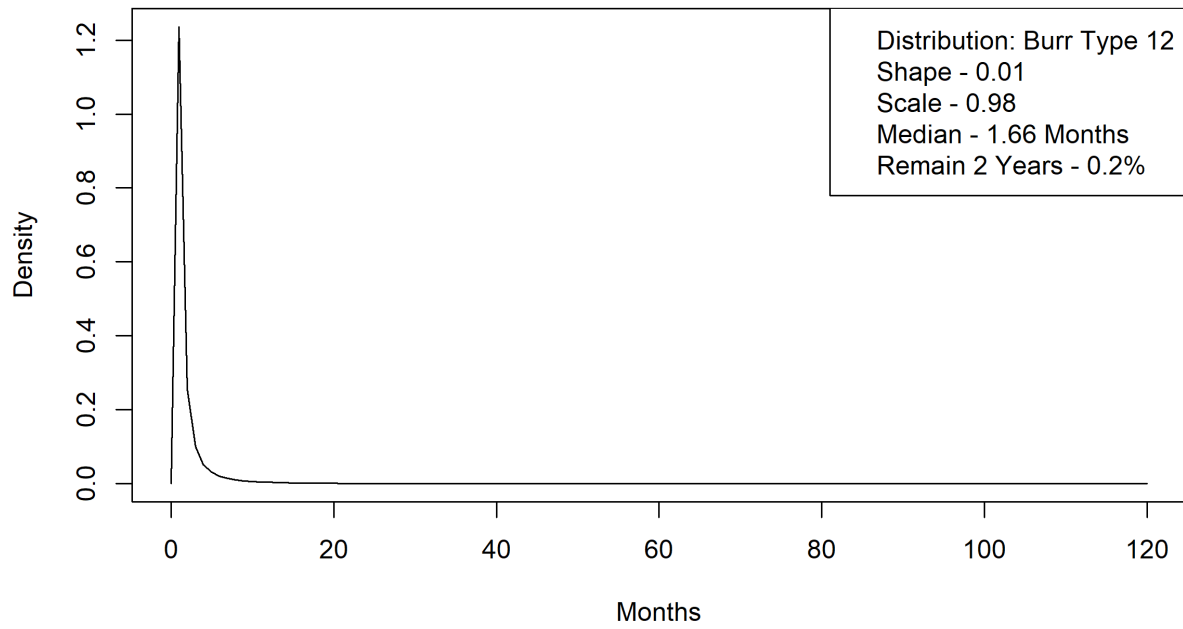


Figure 6A.42 Holding Times: MA No LTSS to MA NF 30-90

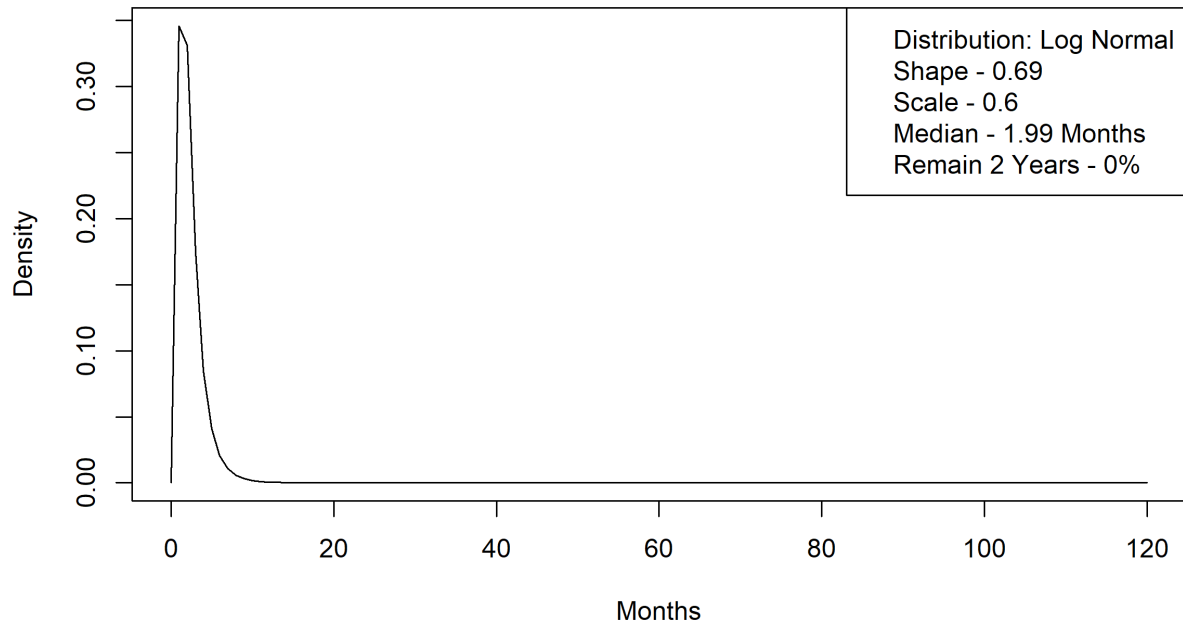


Figure 6A.43 Holding Times: MA No LTSS to MA NF 91+

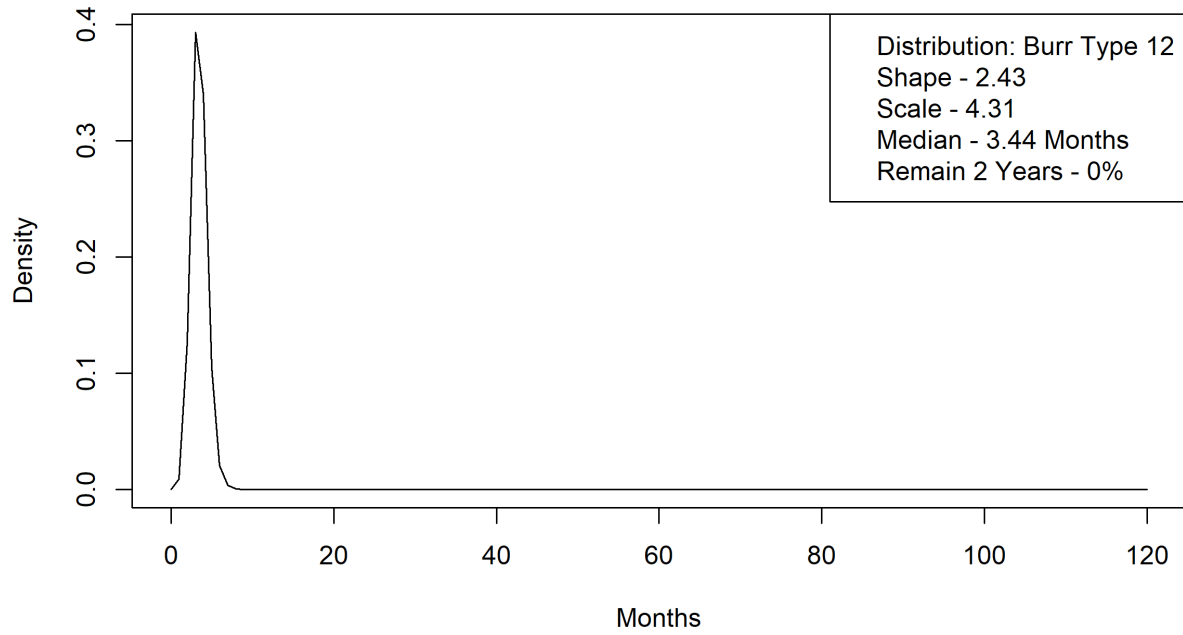


Figure 6A.44 Holding Times: MA No LTSS to PCA

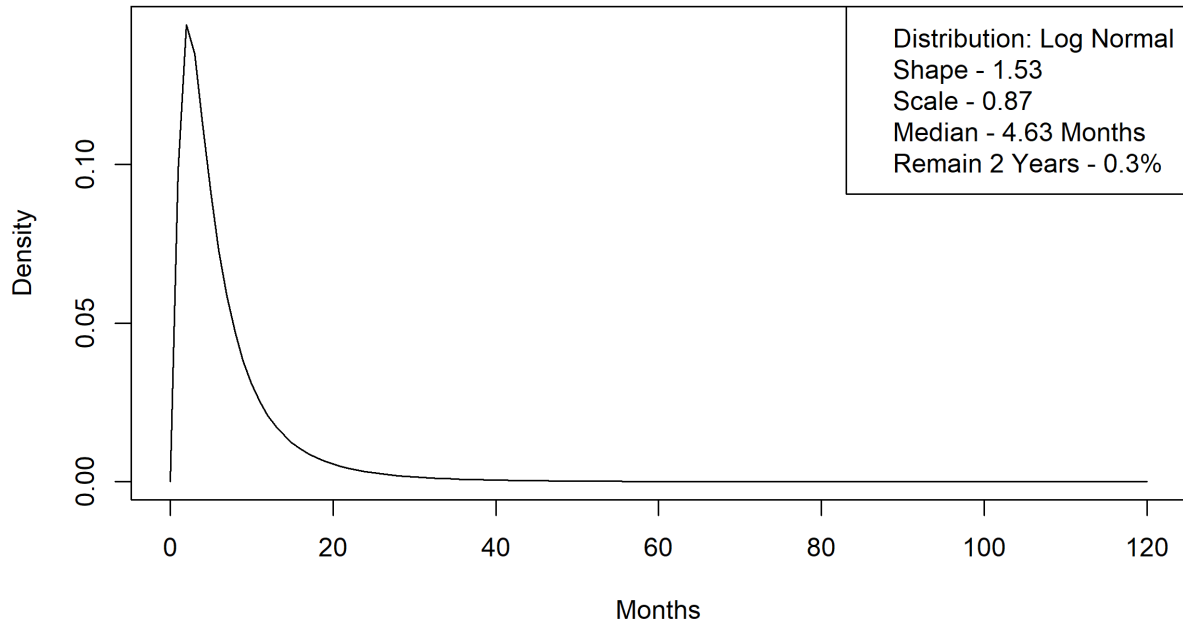


Figure 6A.45 Holding Times: MA No LTSS to AC

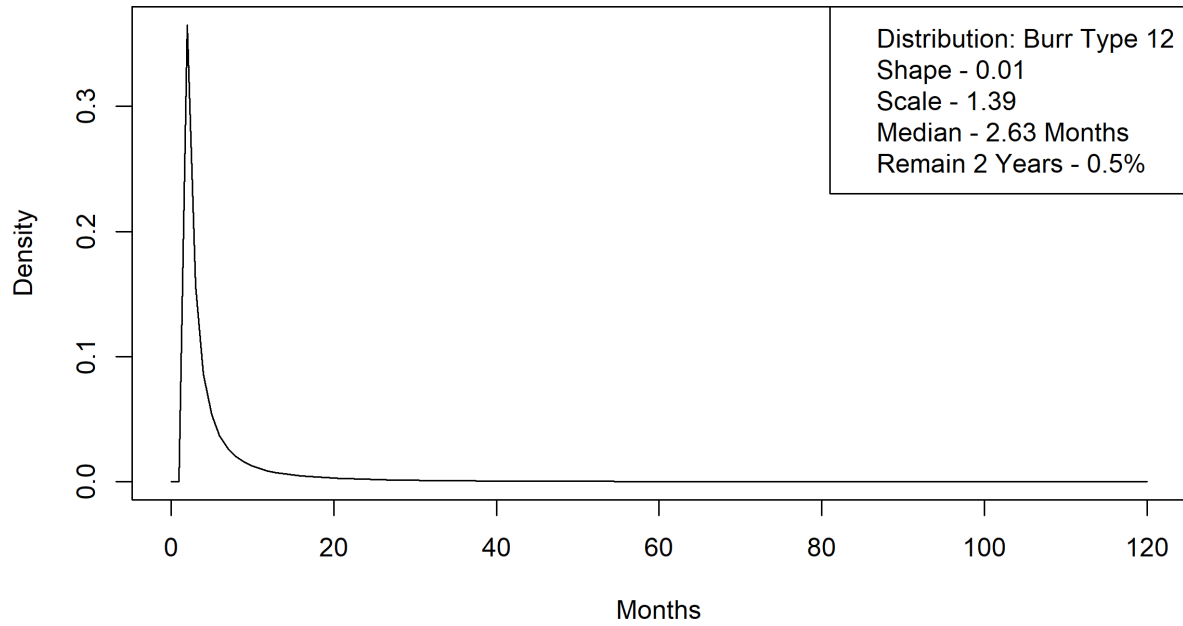


Figure 6A.46 Holding Times: MA No LTSS to NF 0-29

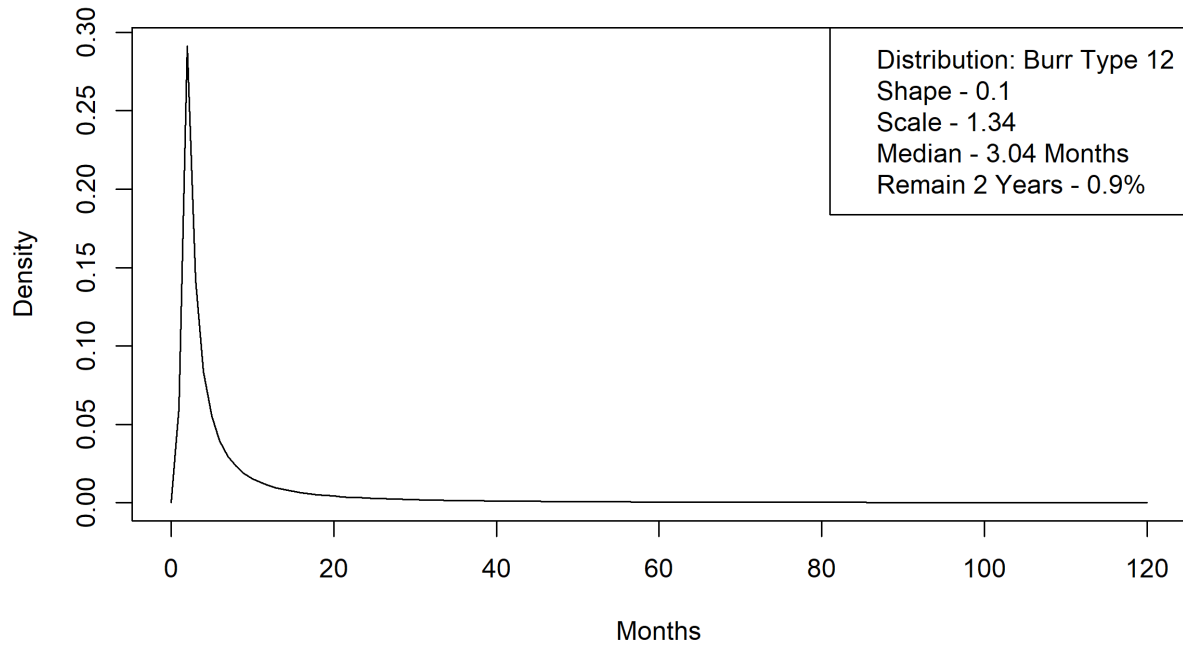


Figure 6A.47 Holding Times: MA No LTSS to NF 30-90

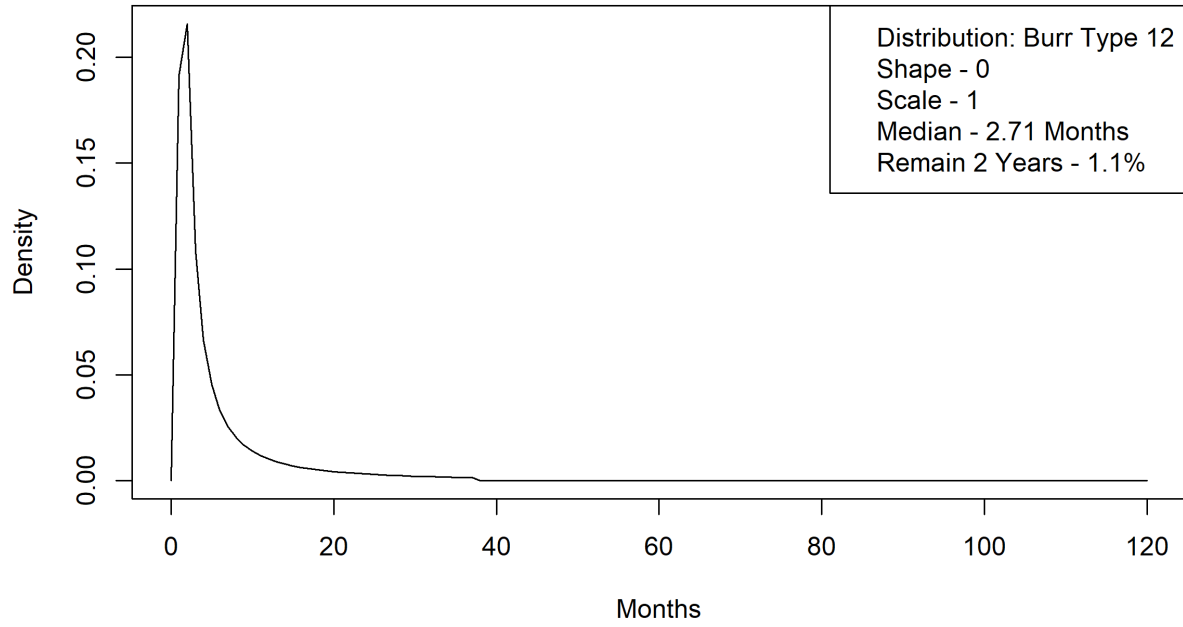


Figure 6A.48 Holding Times: MA No LTSS to No LTSS

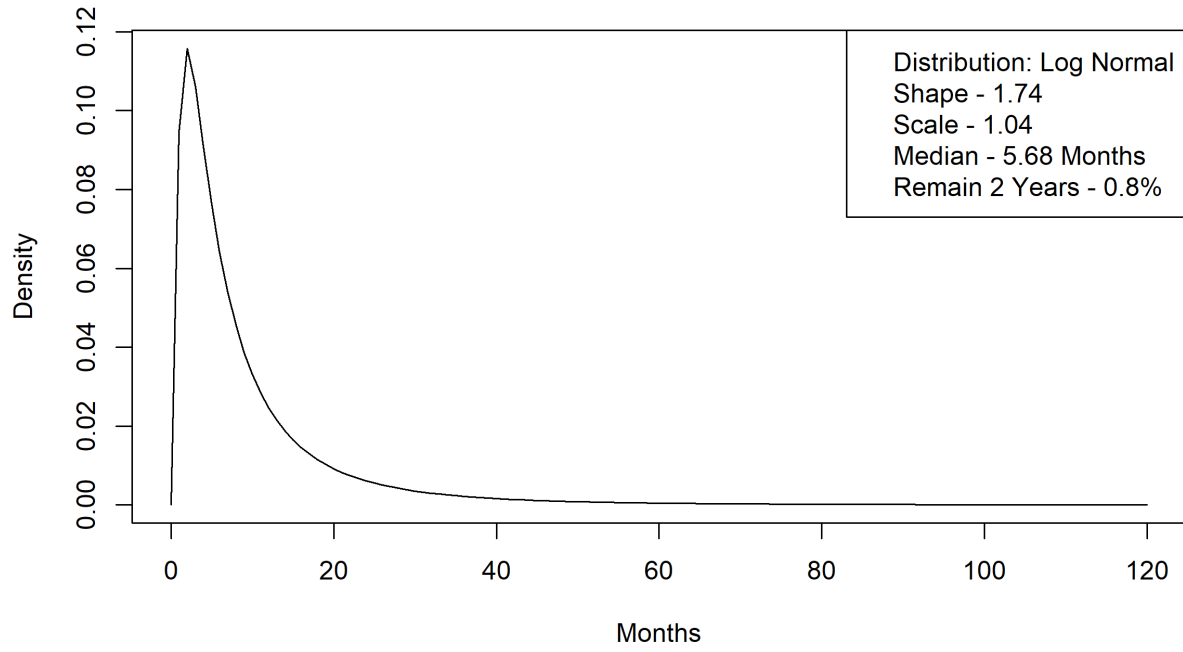


Figure 6A.49 Holding Times: PCA to Death

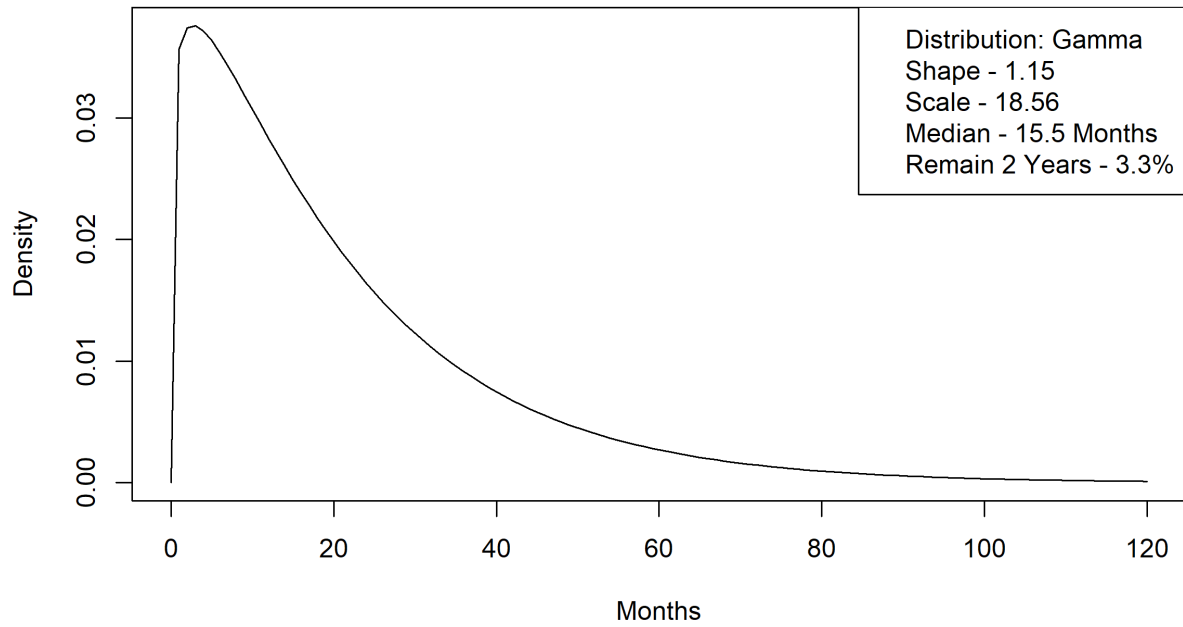


Figure 6A.50 Holding Times: PCA to EWC

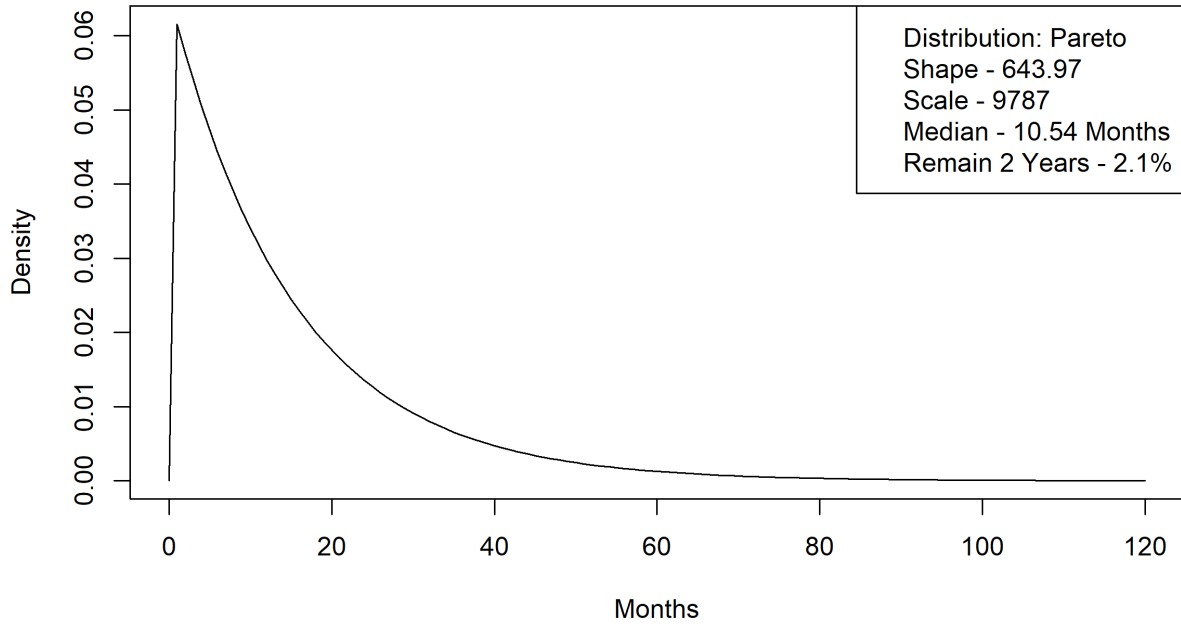


Figure 6A.51 Holding Times: PCA to EWR

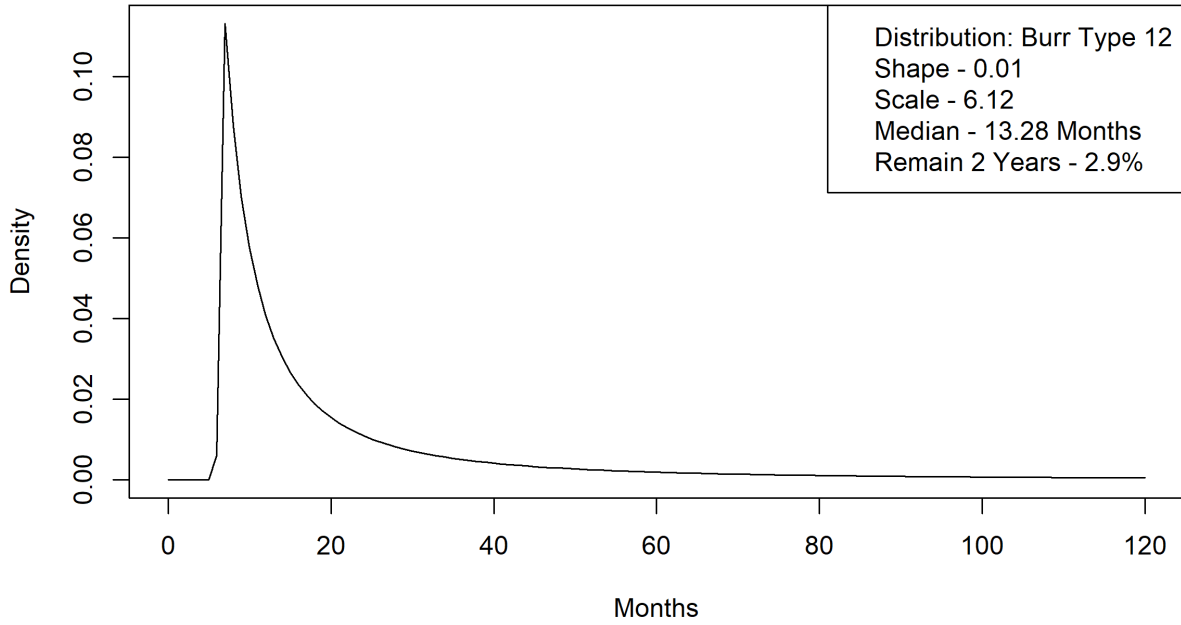


Figure 6A.52 Holding Times: PCA to MA NF 0-29

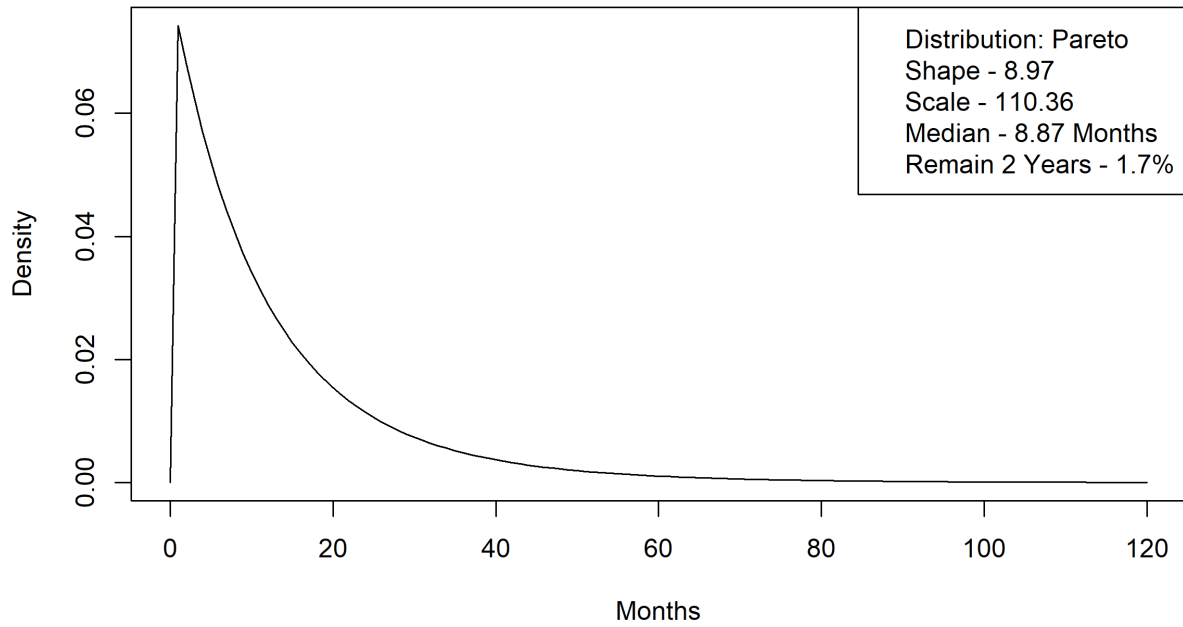


Figure 6A.53 Holding Times: PCA to MA No LTSS

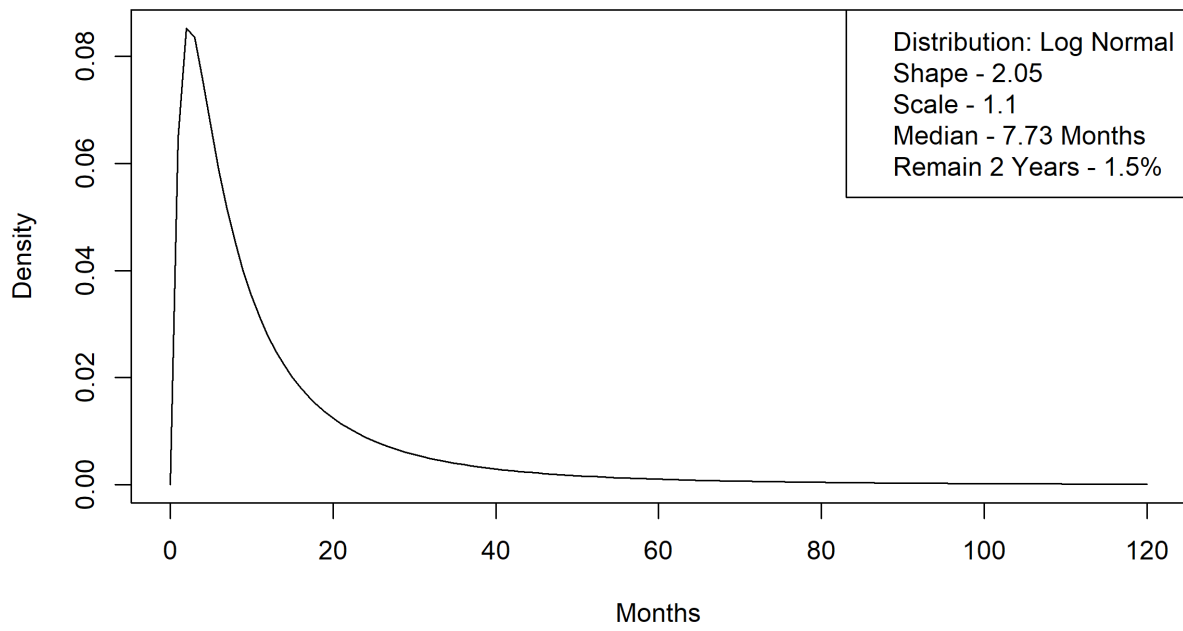


Figure 6A.54 Holding Times: PCA to No LTSS

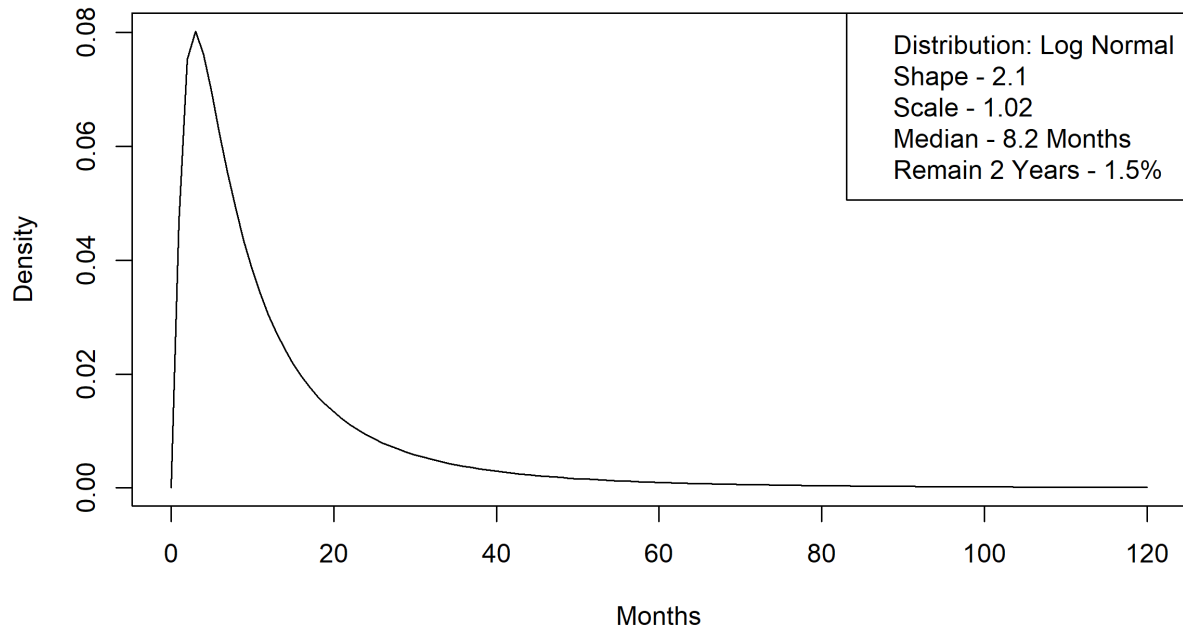


Figure 6A.55 Holding Times: AC to Death

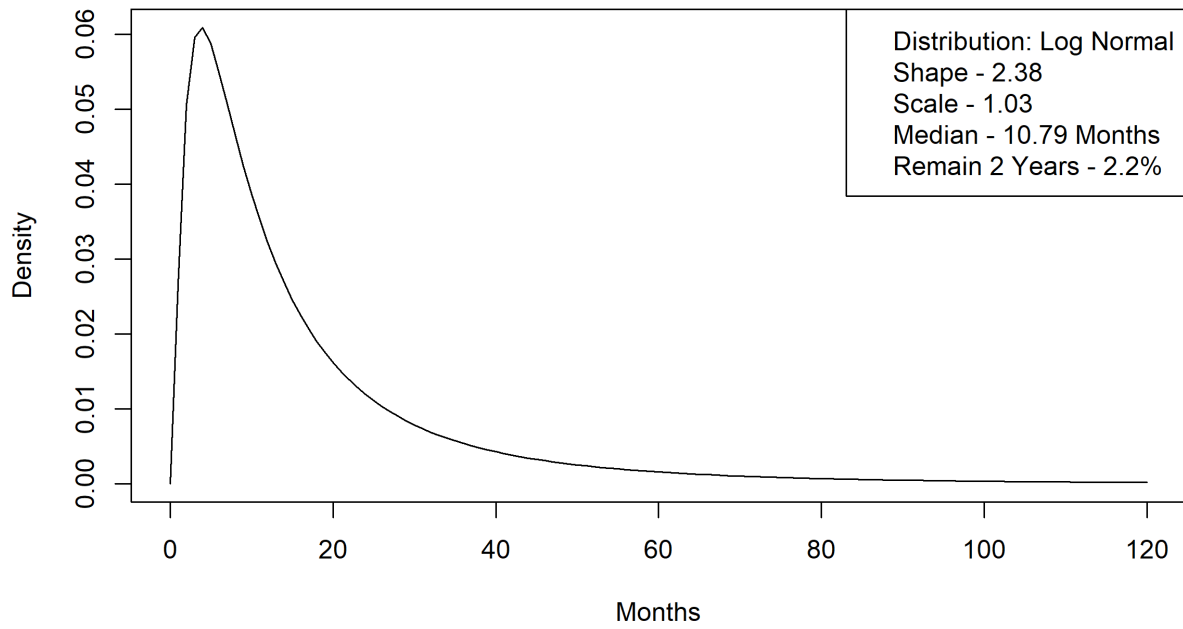


Figure 6A.56 Holding Times: AC to EWC

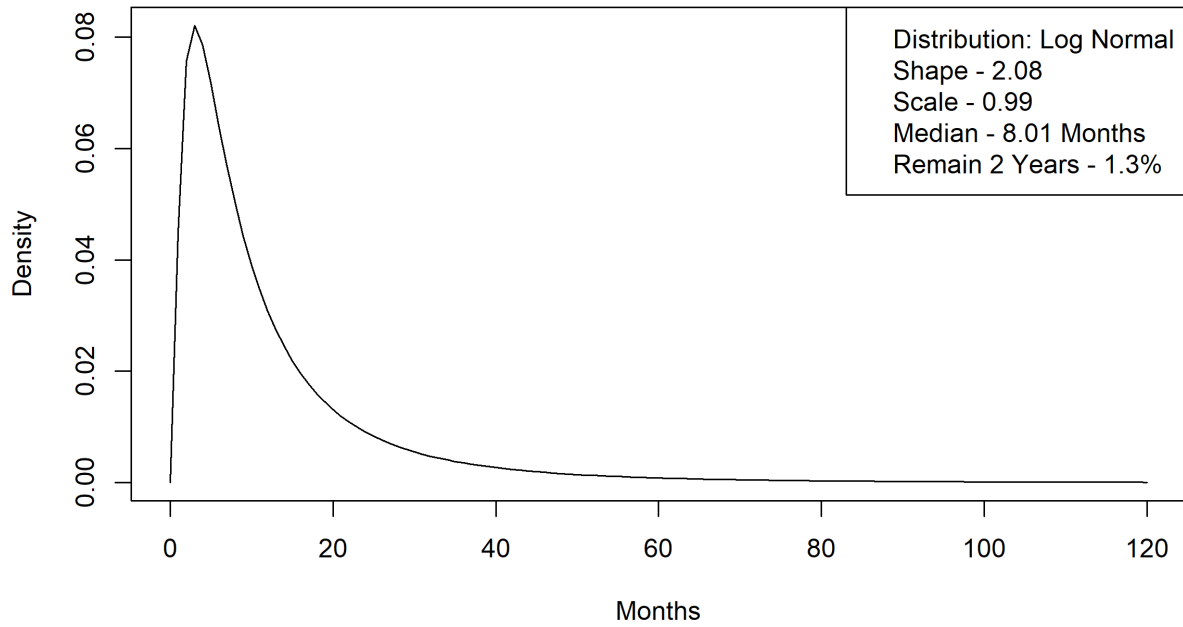


Figure 6A.57 Holding Times: AC to EWR

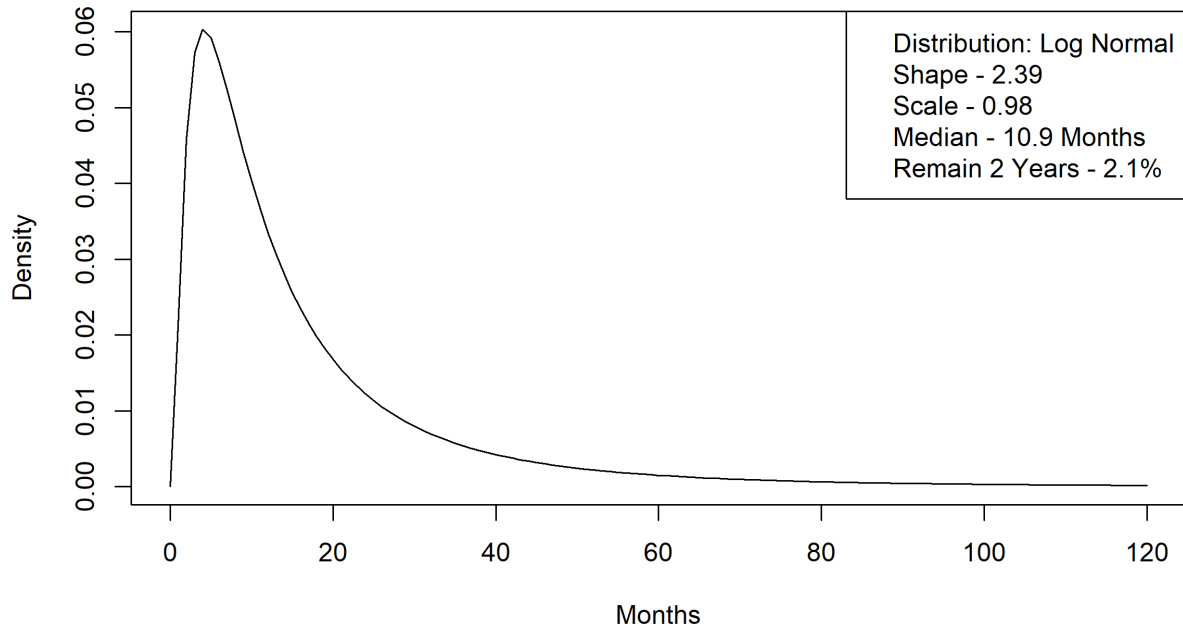


Figure 6A.58 Holding Times: AC to MA NF 0-29

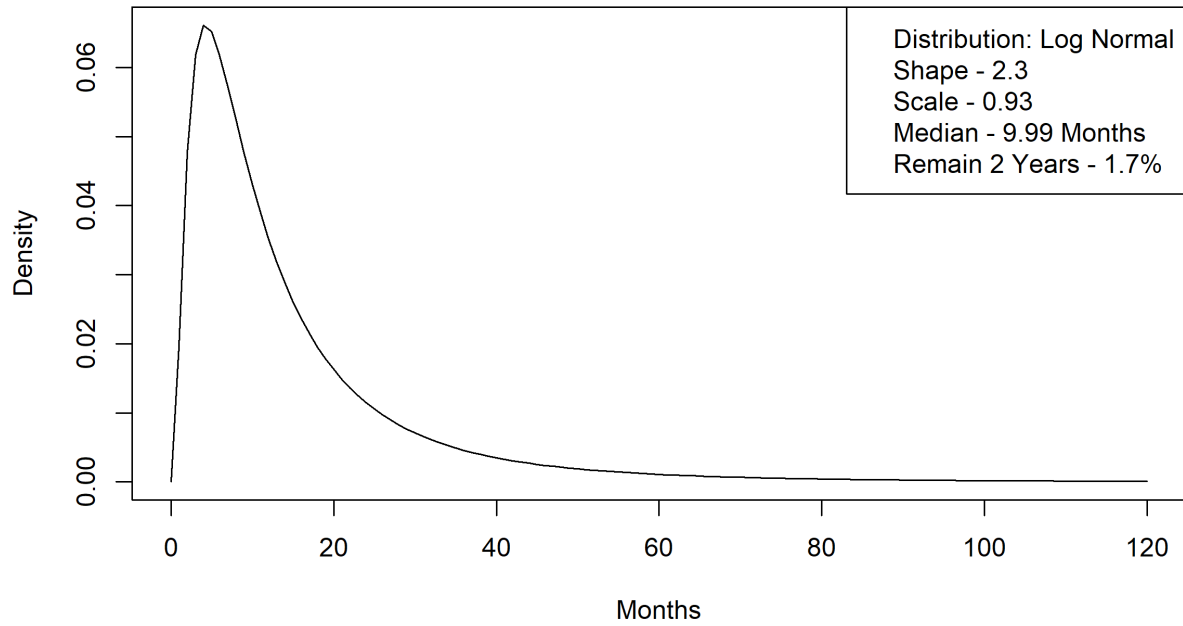


Figure 6A.59 Holding Times: AC to MA NF 30-90

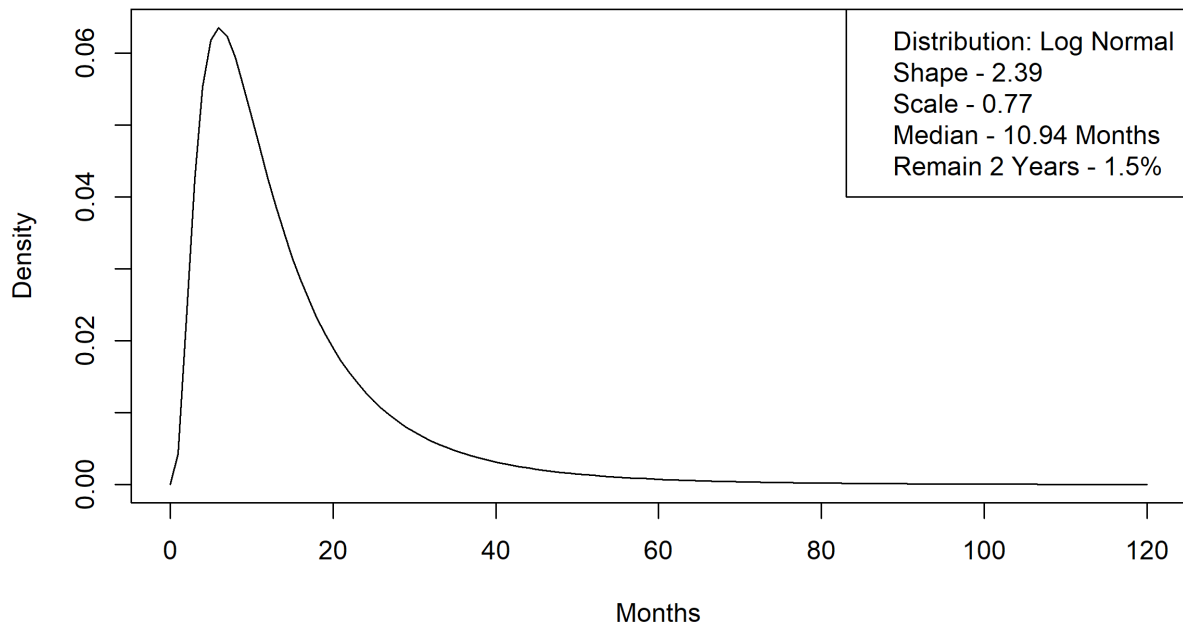


Figure 6A.60 Holding Times: AC to MA No LTSS

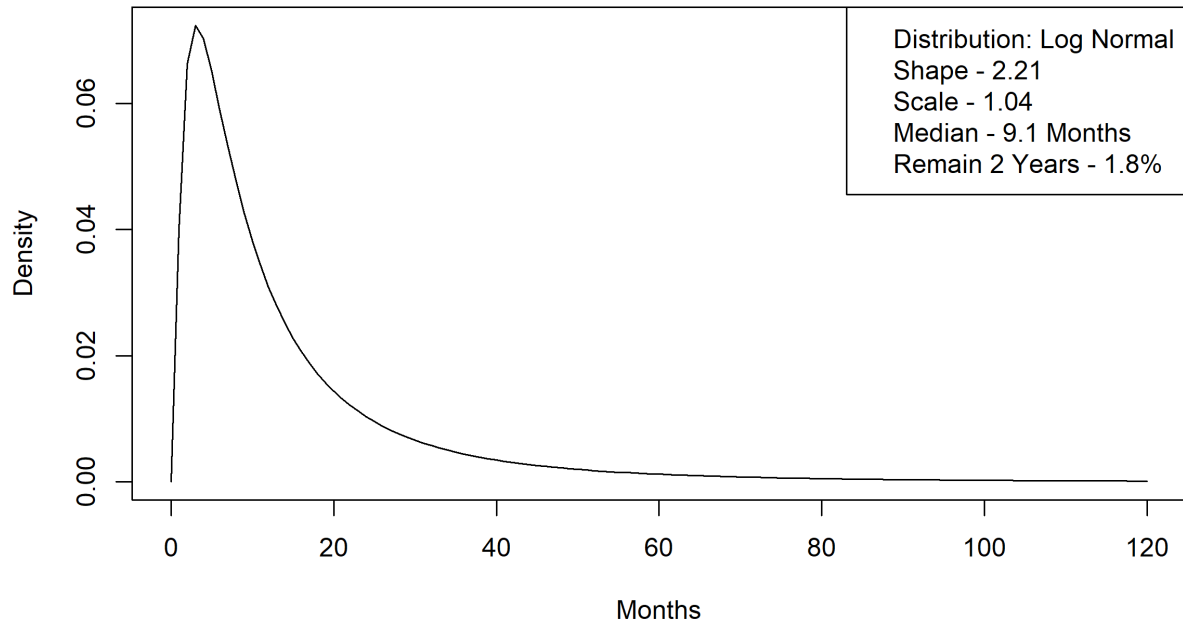


Figure 6A.61 Holding Times: AC to PCA

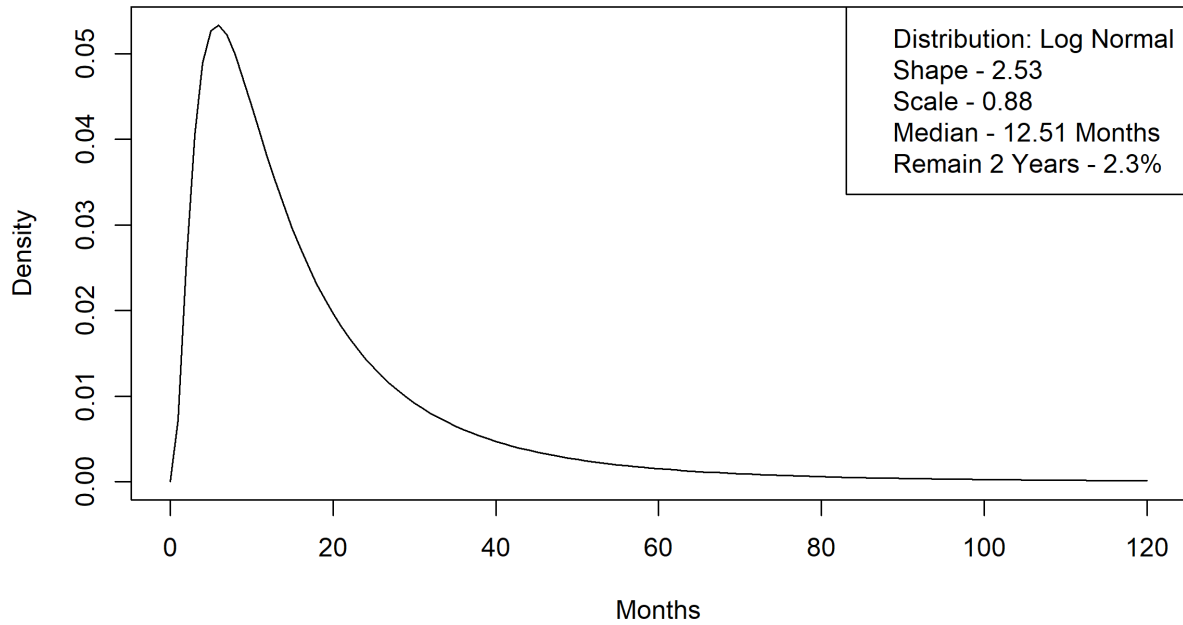


Figure 6A.62 Holding Times: AC to NF 0-29

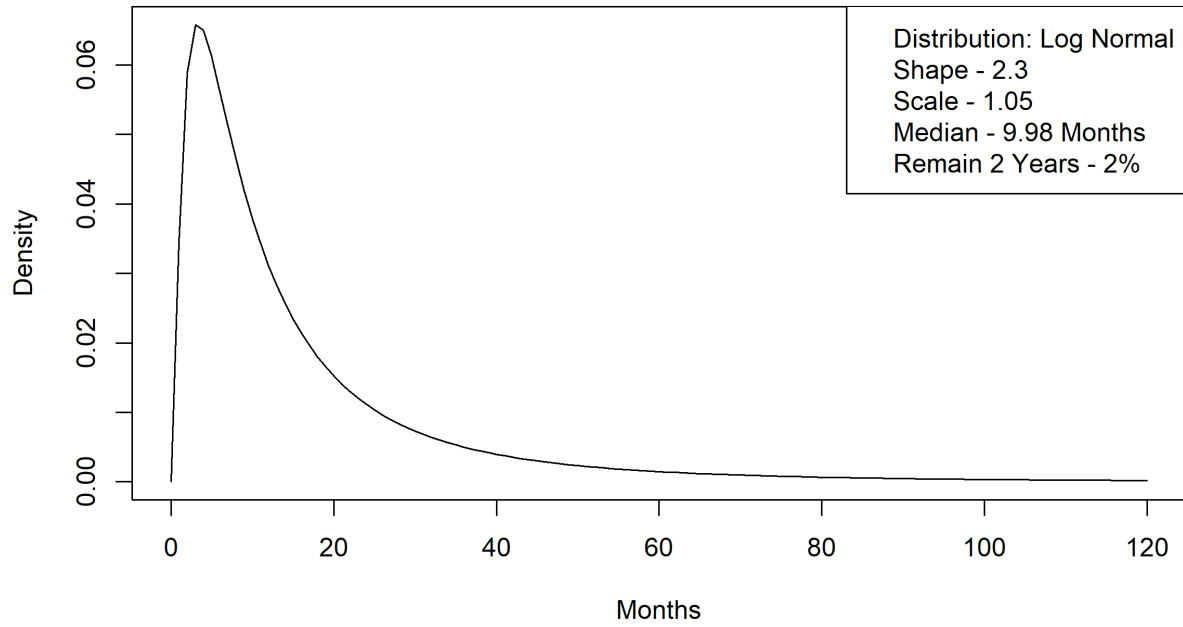


Figure 6A.63 Holding Times: AC to NF 30-90

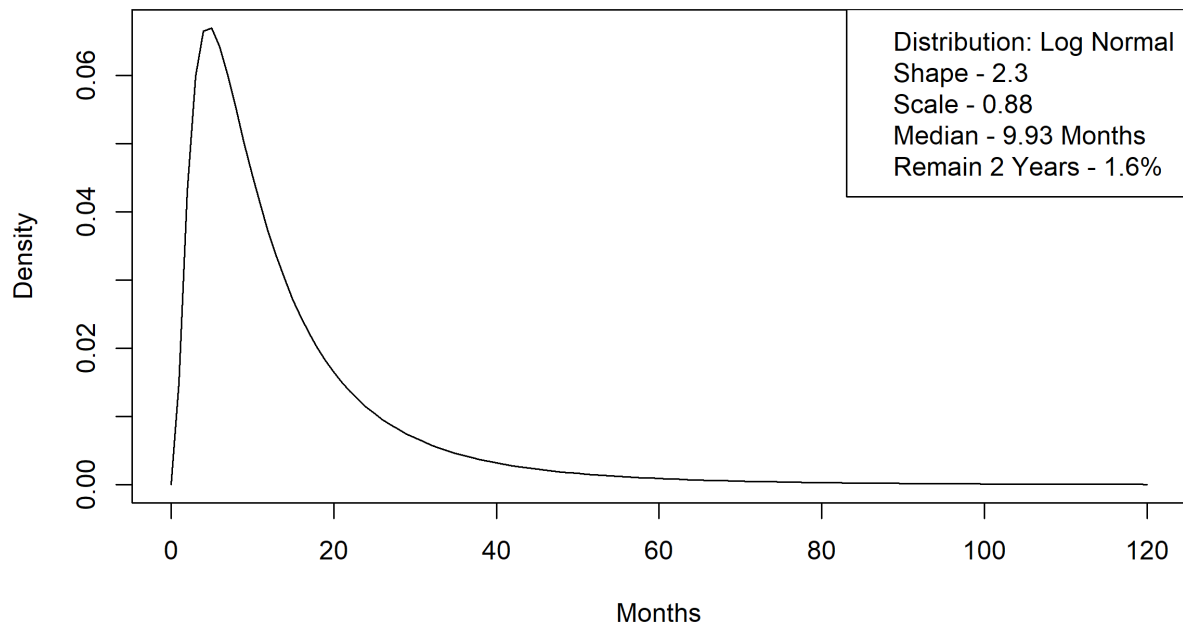


Figure 6A.64 Holding Times: AC to No LTSS

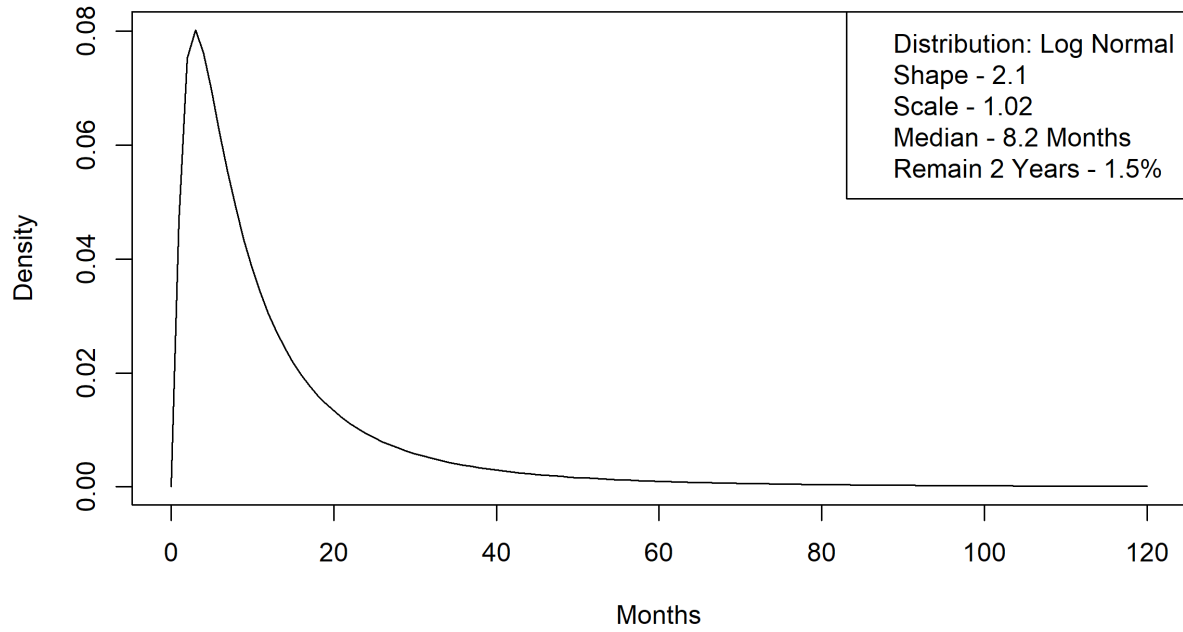


Figure 6A.65 Holding Times: NF 91+ to Death

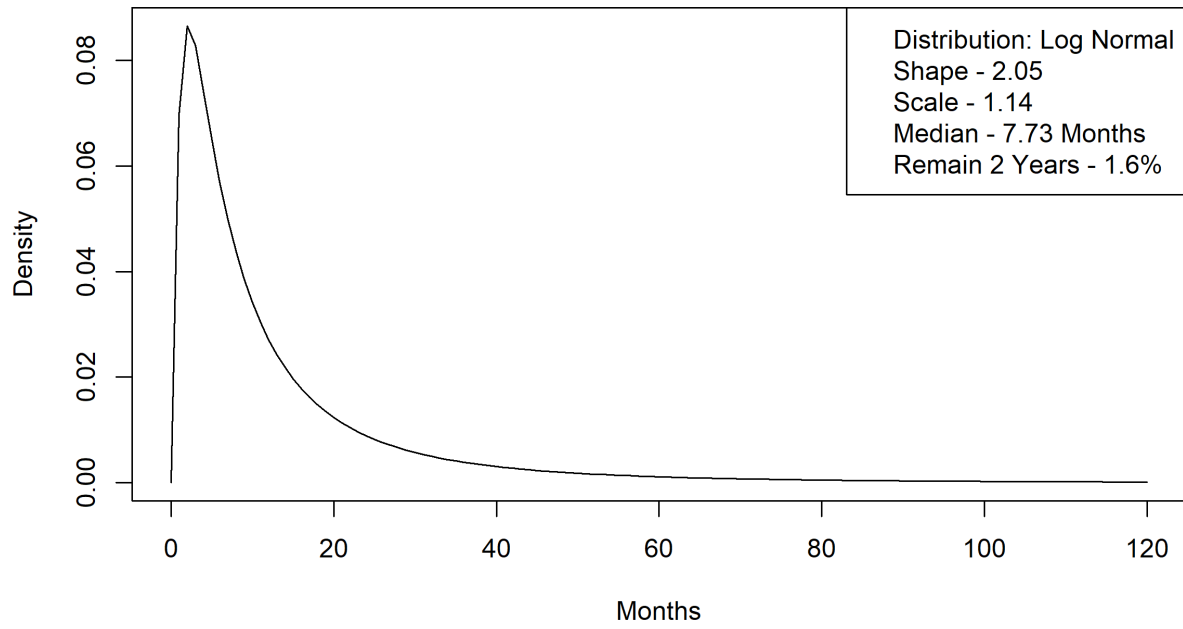


Figure 6A.66 Holding Times: NF 91+ to EWC

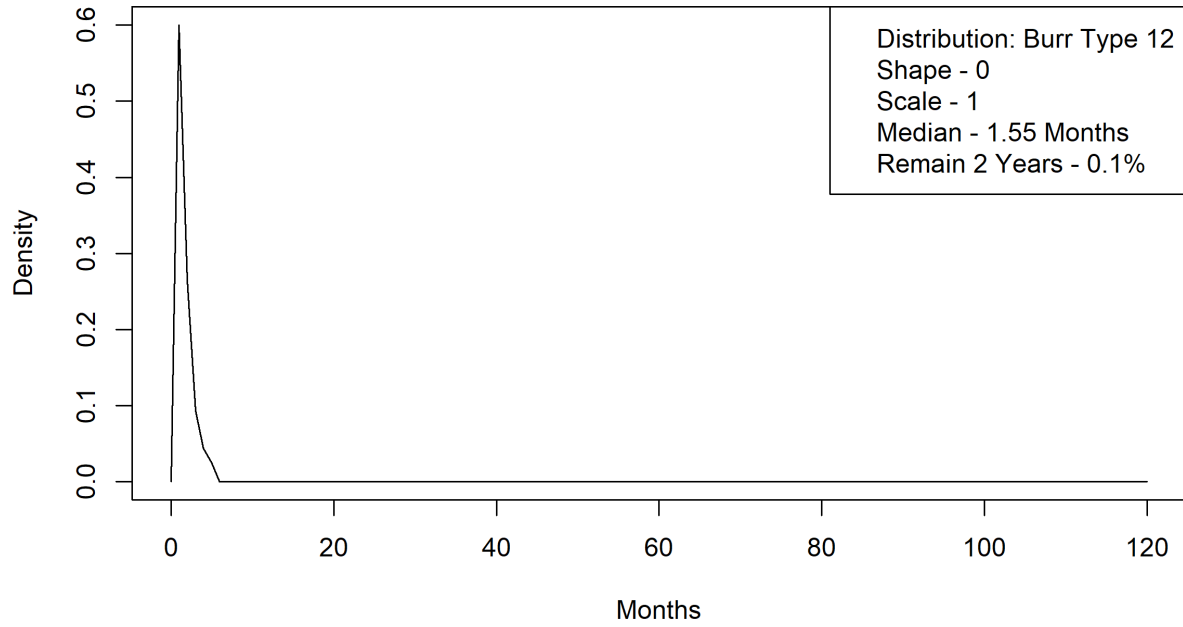


Figure 6A.67 Holding Times: NF 91+ to EWR

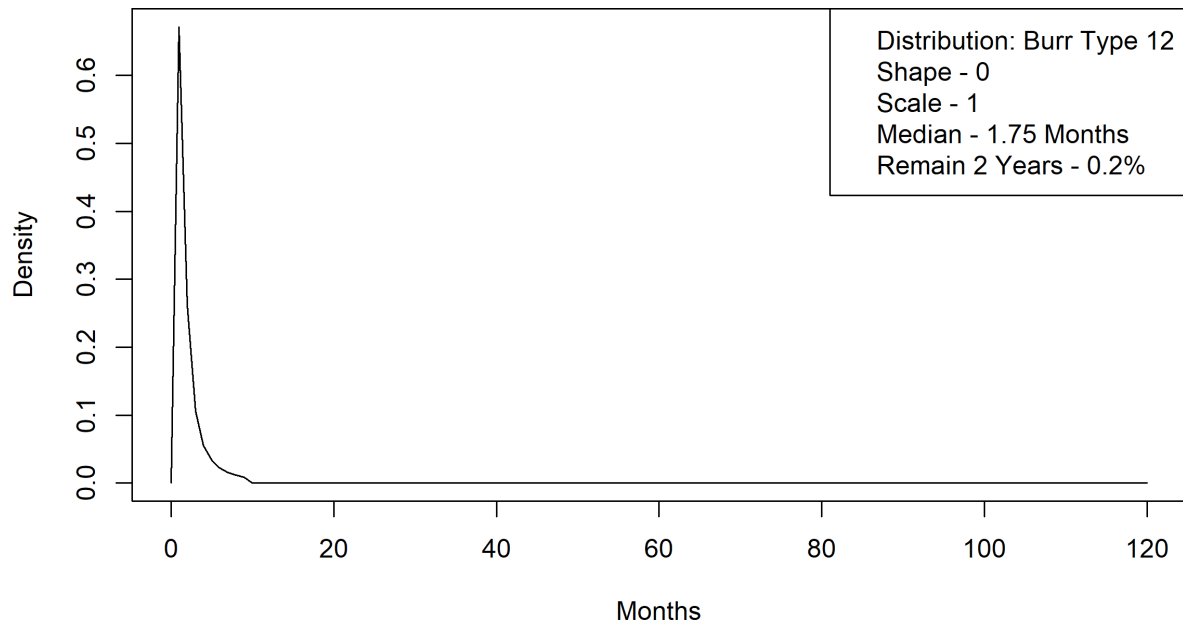


Figure 6A.68 Holding Times: NF 91+ to MA NF 0-29

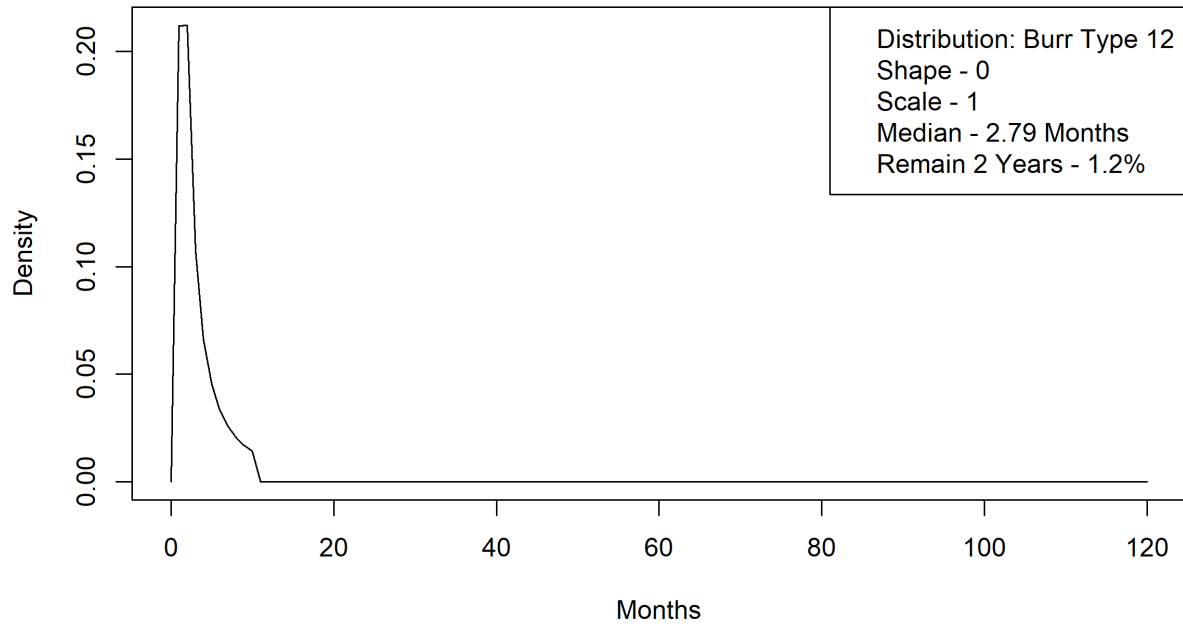


Figure 6A.69 Holding Times: NF 91+ to MA NF 30-90

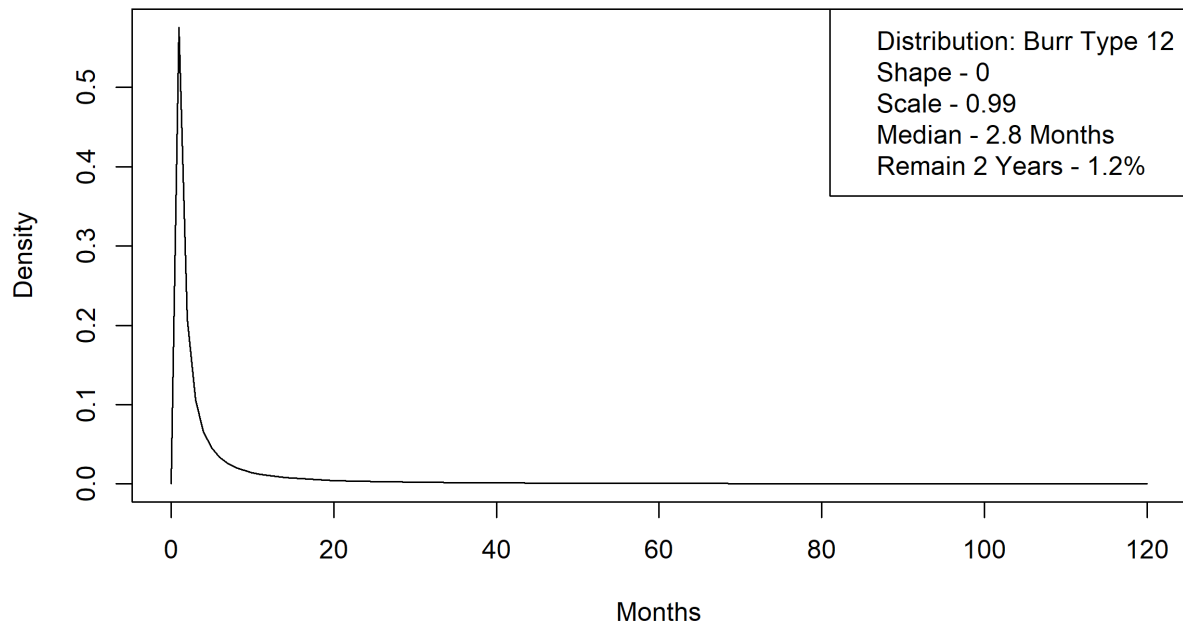


Figure 6A.70 Holding Times: NF 91+ to MA no LTSS

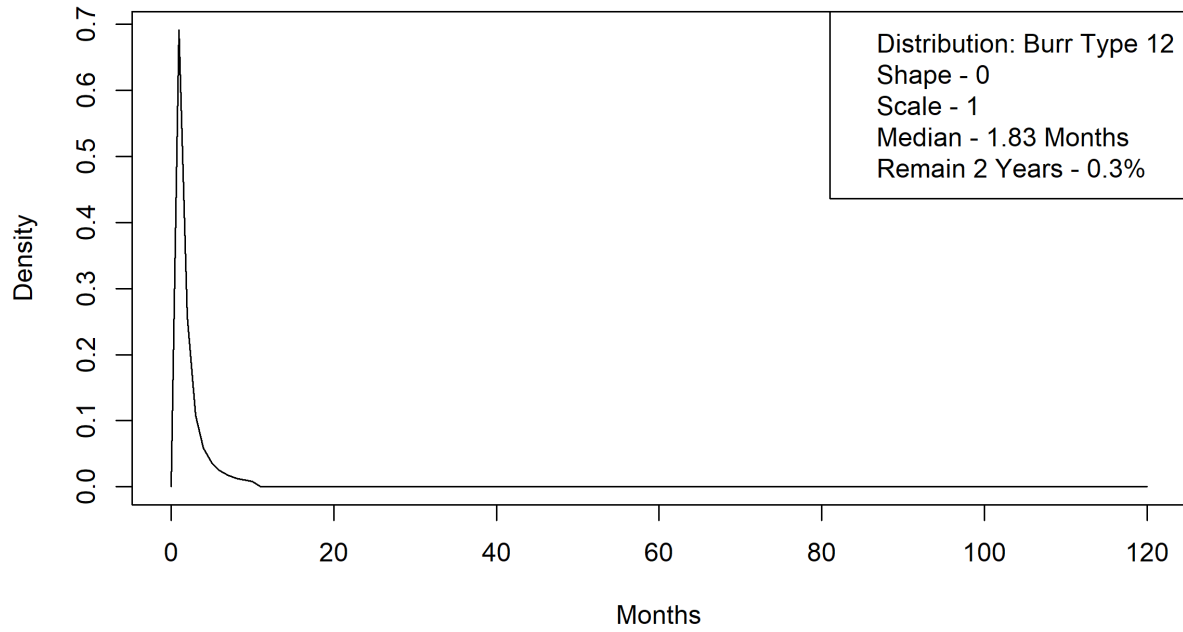


Figure 6A.71 Holding Times: NF 91+ to AC

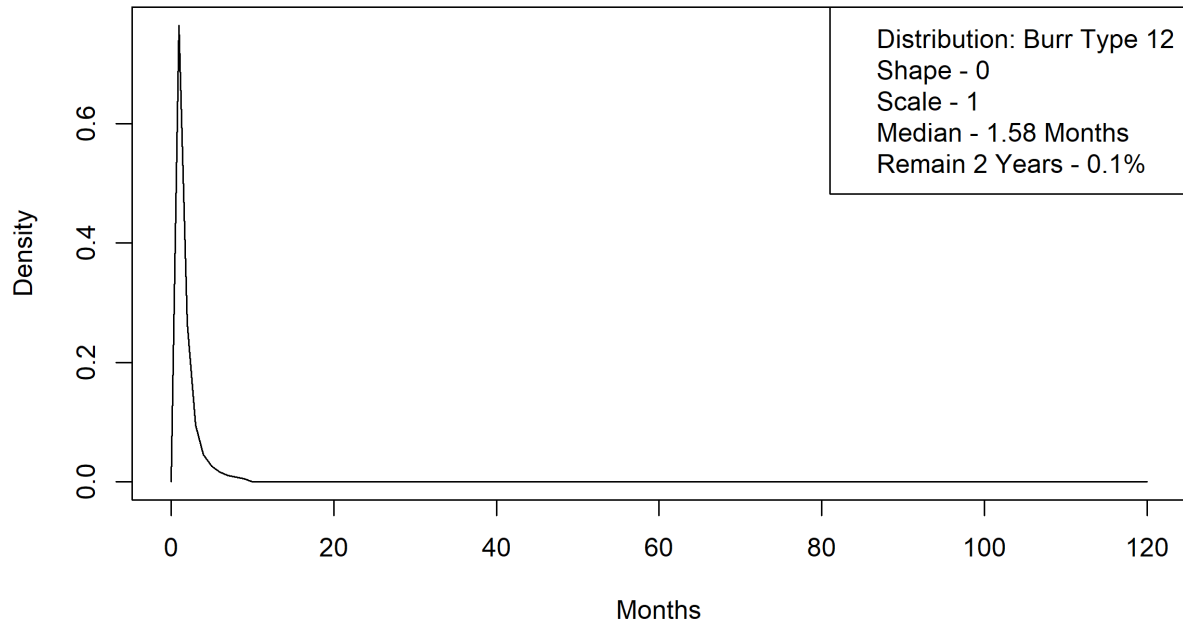


Figure 6A.72 Holding Times: NF 91+ to NF 0-29

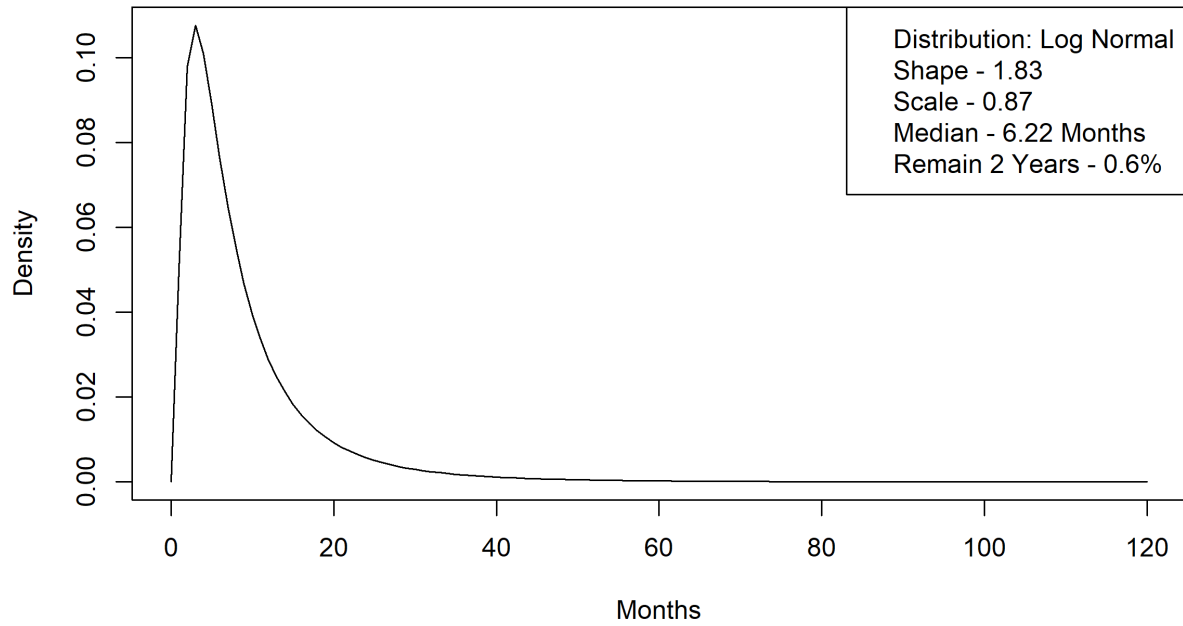


Figure 6A.73 Holding Times: NF 91+ to NF 30-90

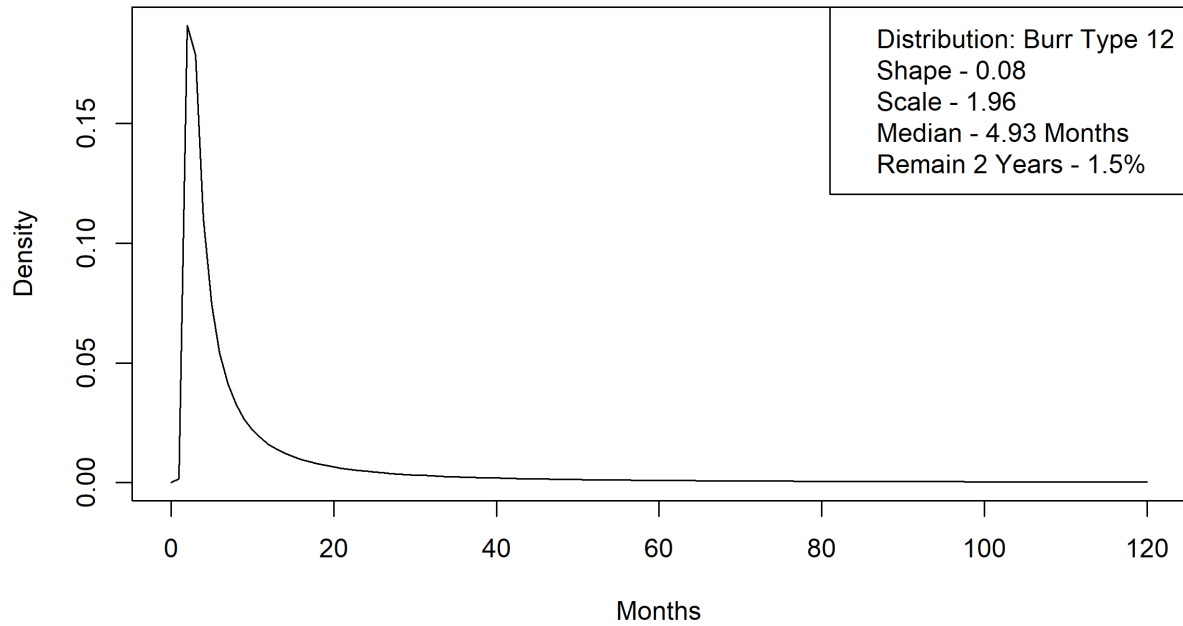


Figure 6A.74 Holding Times: NF 91+ to No LTSS

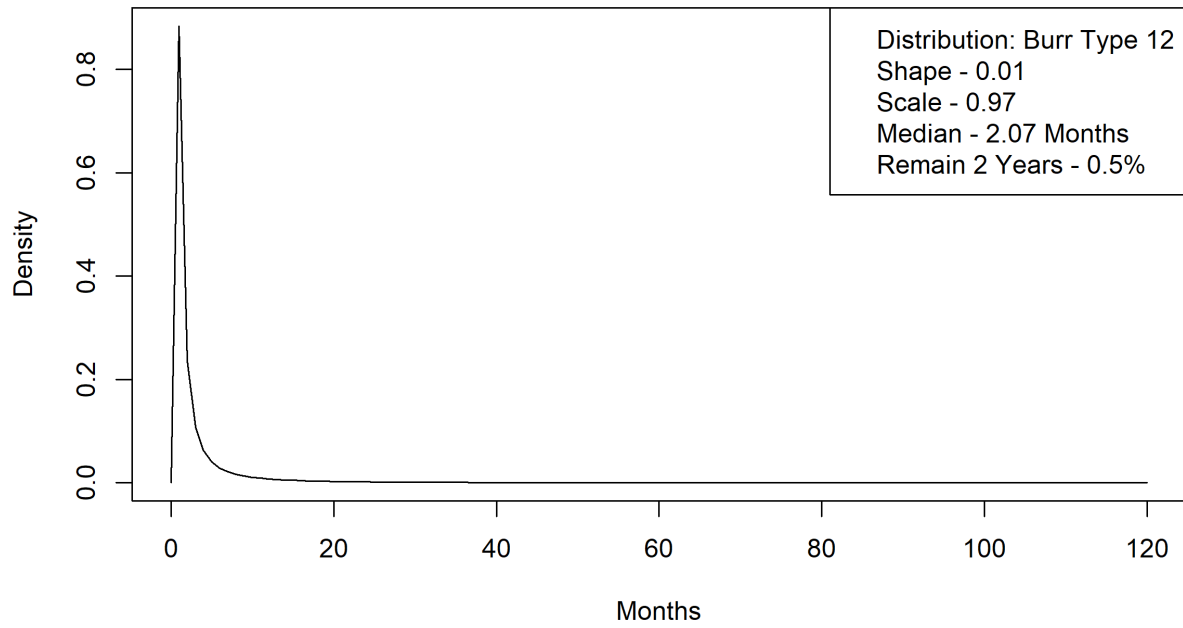


Figure 6A.75 Holding Times: NF 91+ to No LTSS to Death

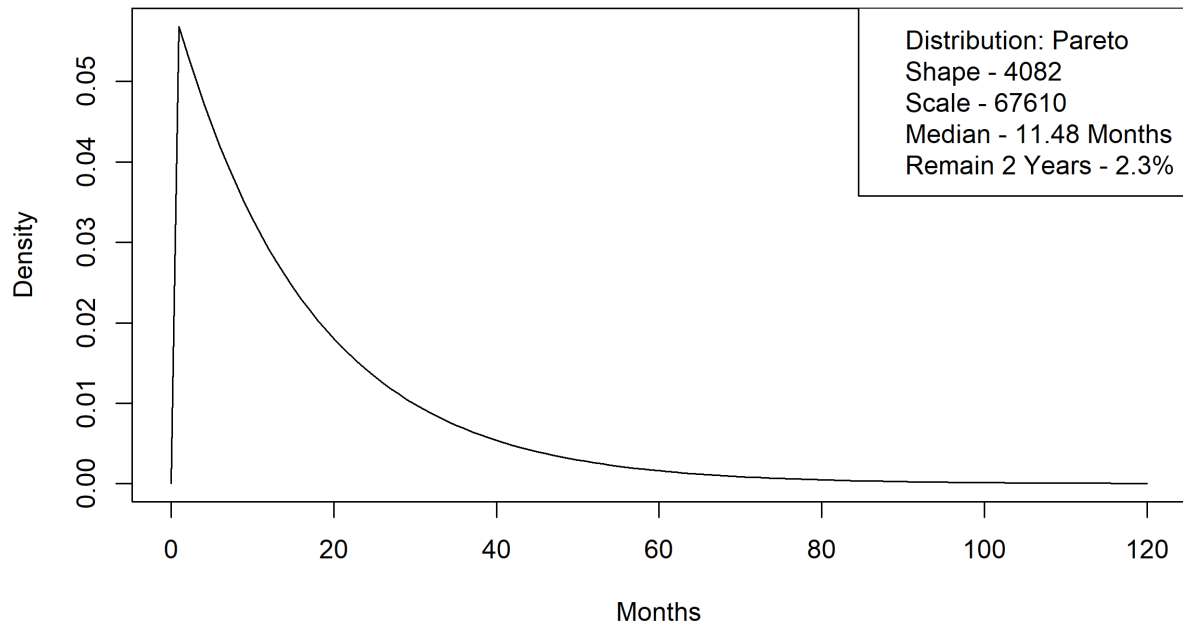


Figure 6A.76 Holding Times: NF 91+ to No LTSS to EWC

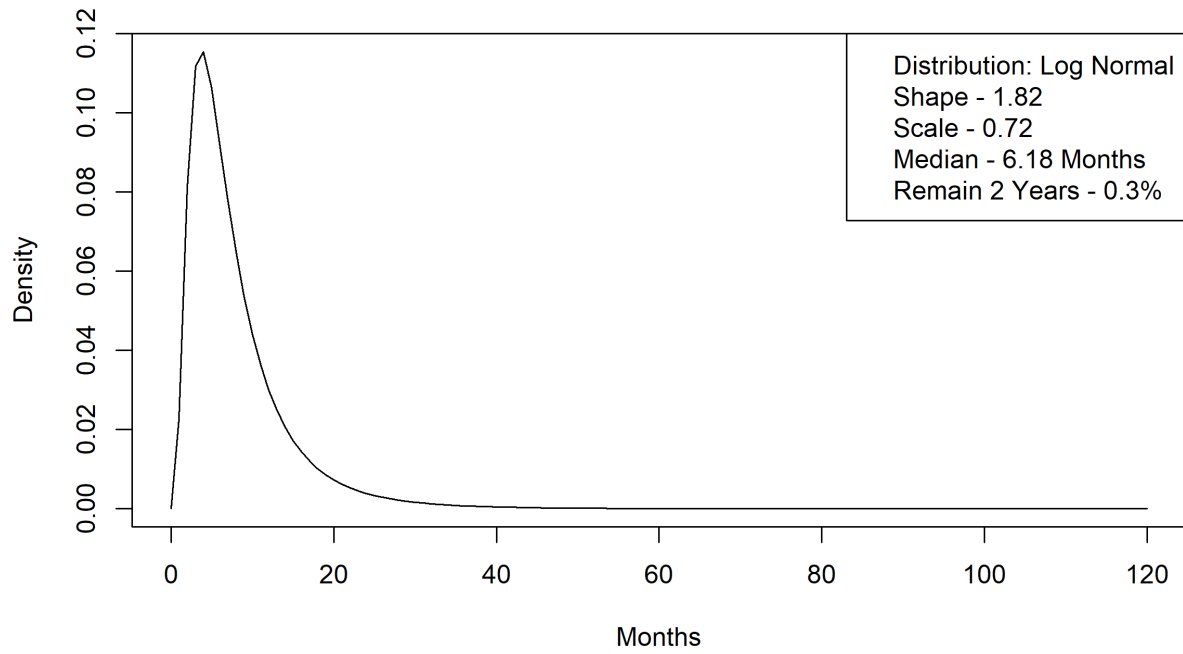


Figure 6A.77 Holding Times: NF 91+ to No LTSS to EWR

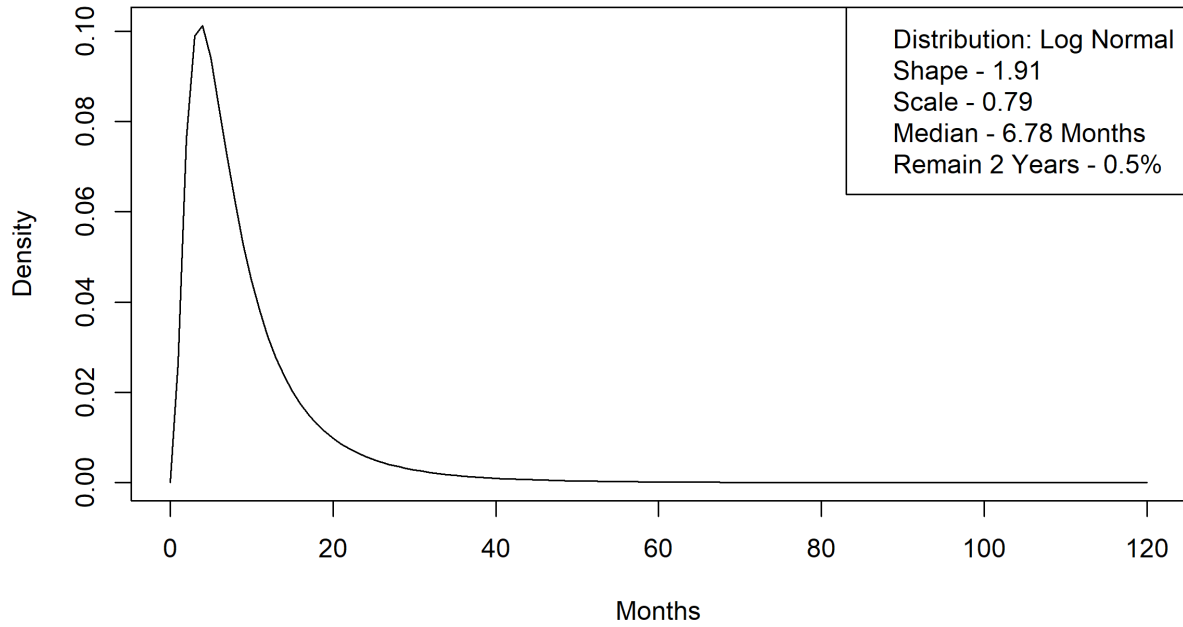


Figure 6A.78 Holding Times: NF 91+ to No LTSS to MA NF 0-29

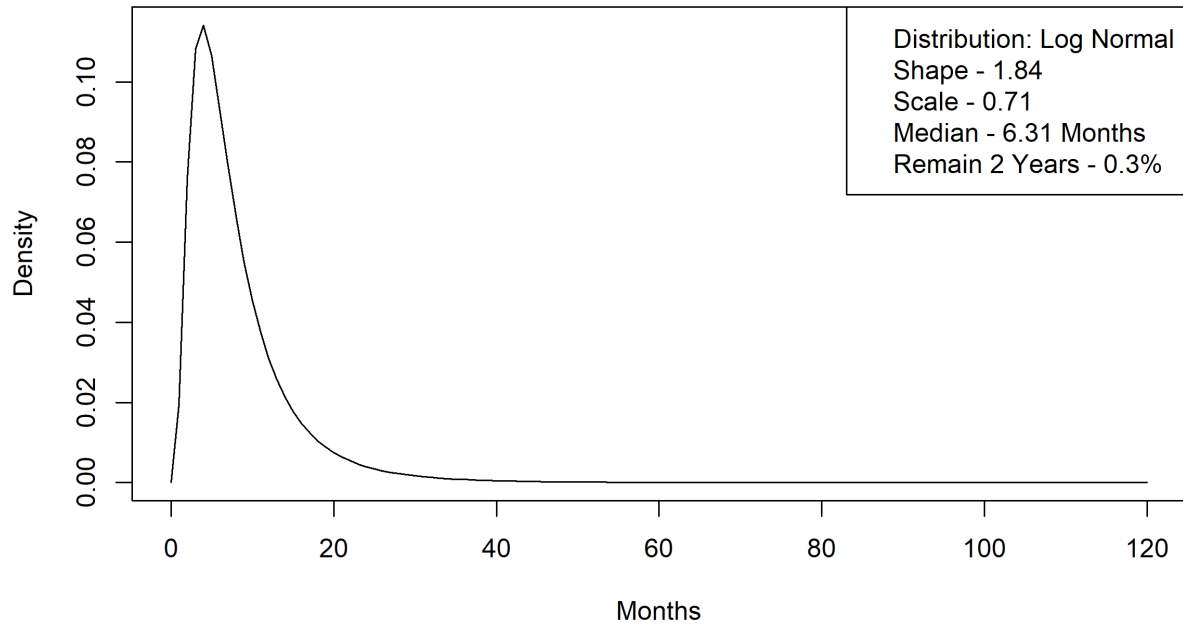


Figure 6A.79 Holding Times: NF 91+ to No LTSS to MA NF 30-90

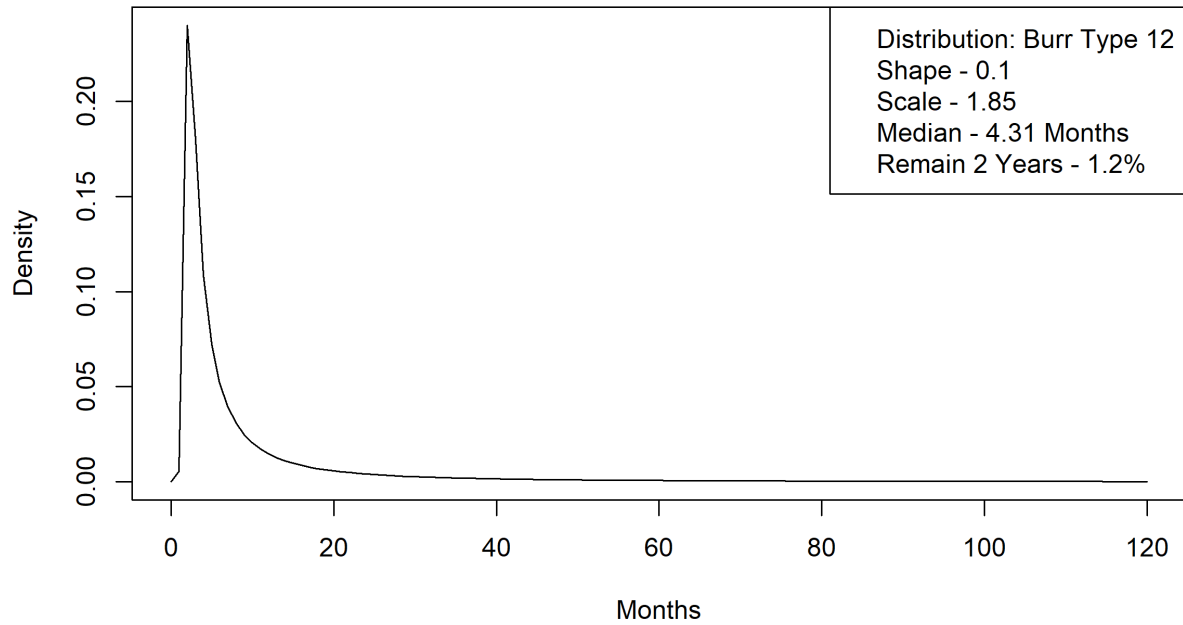


Figure 6A.80 Holding Times: NF 91+ to No LTSS to MA NF 91+

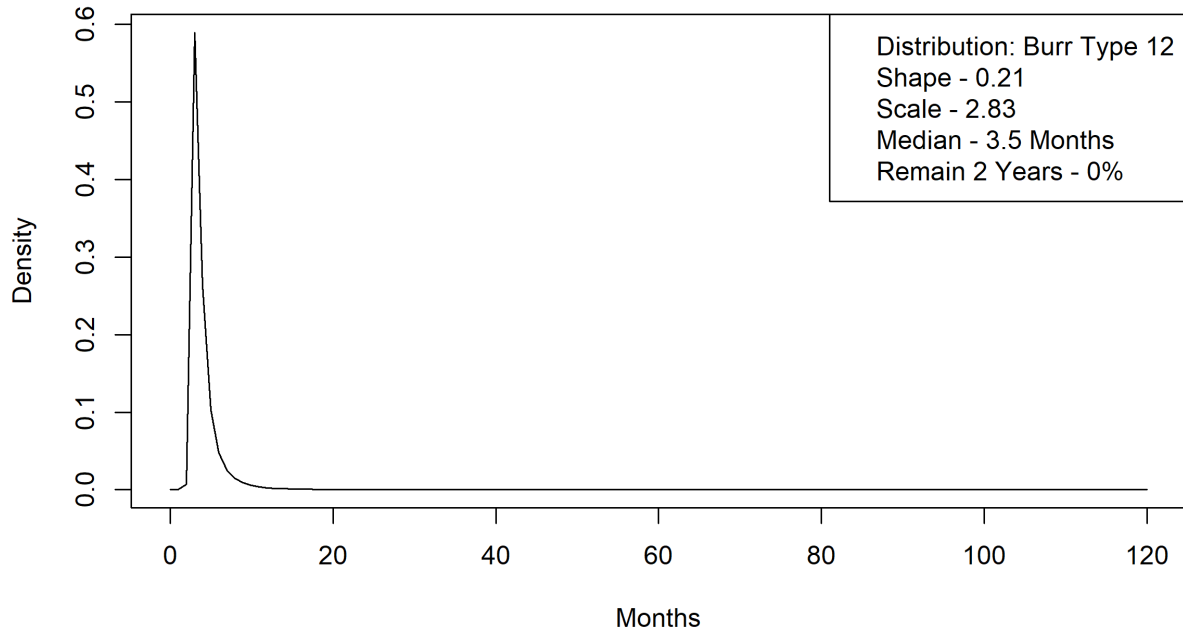


Figure 6A.81 Holding Times: NF 91+ to No LTSS to MA no LTSS

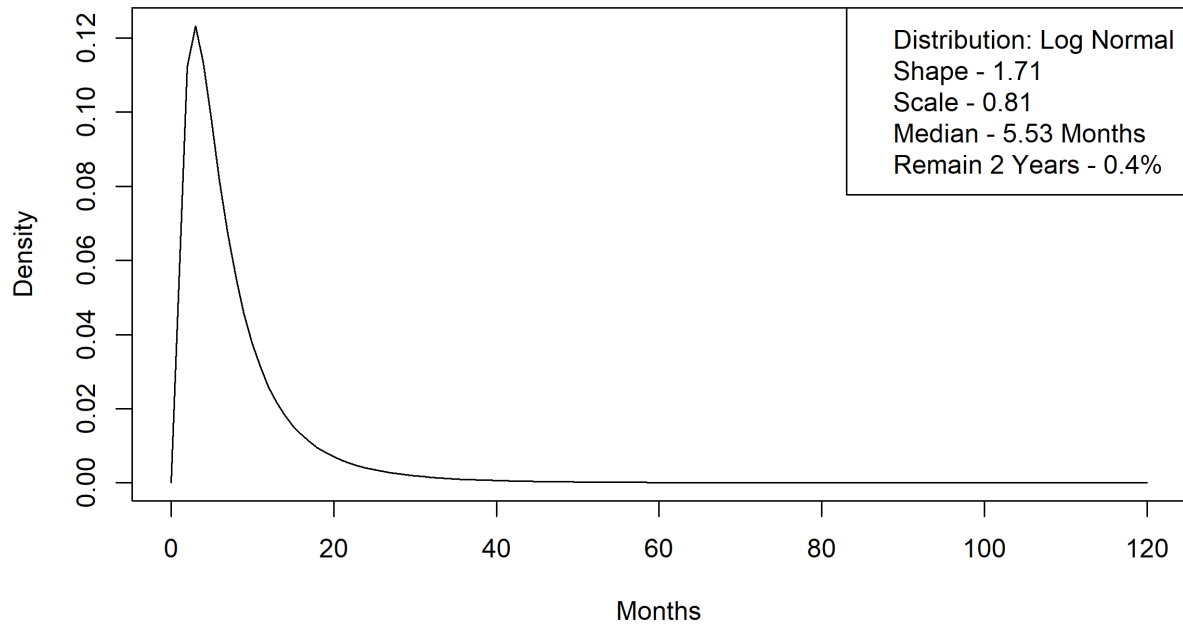


Figure 6A.82 Holding Times: NF 91+ to No LTSS to PCA

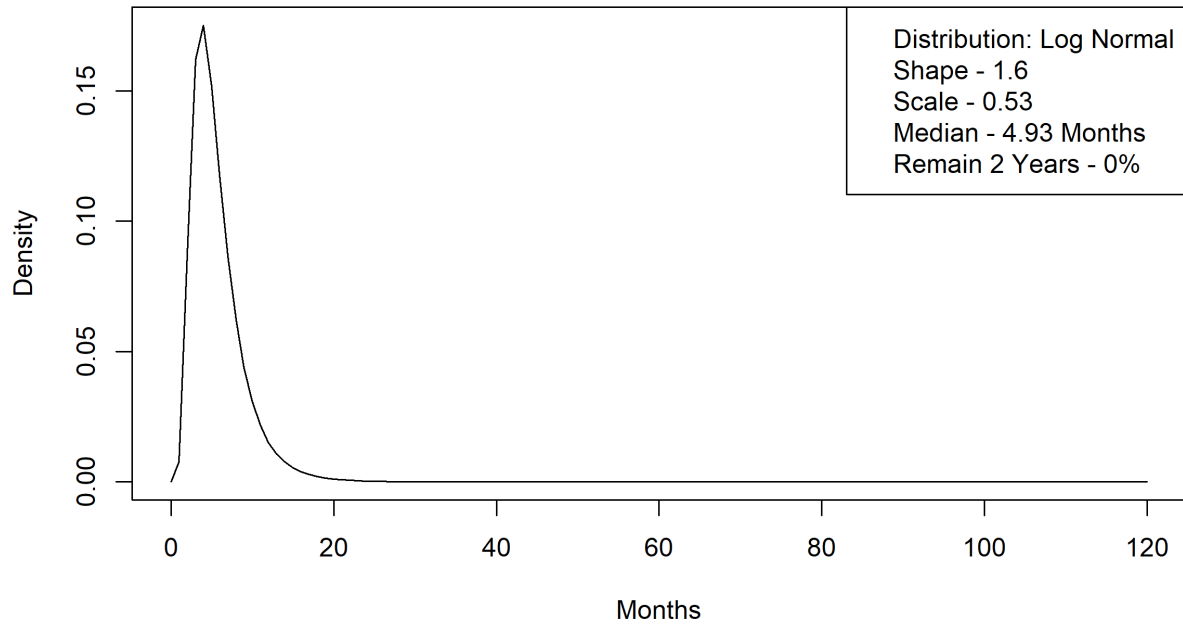


Figure 6A.83 Holding Times: NF 91+ to No LTSS to AC

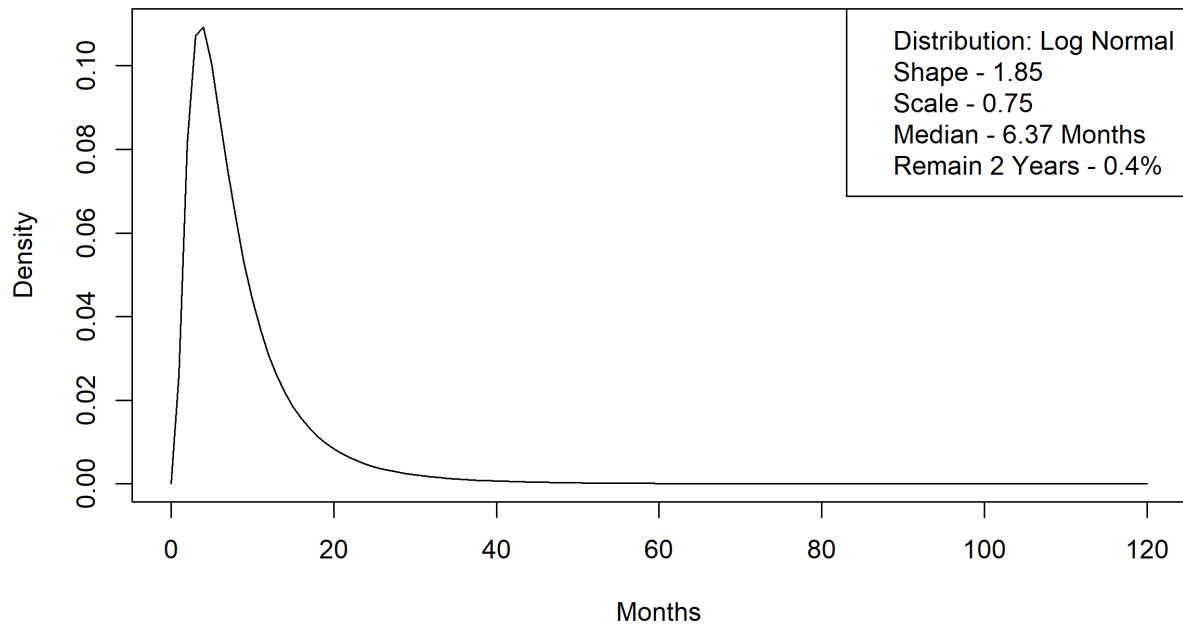


Figure 6A.84 Holding Times: NF 91+ to No LTSS to NF 0-29

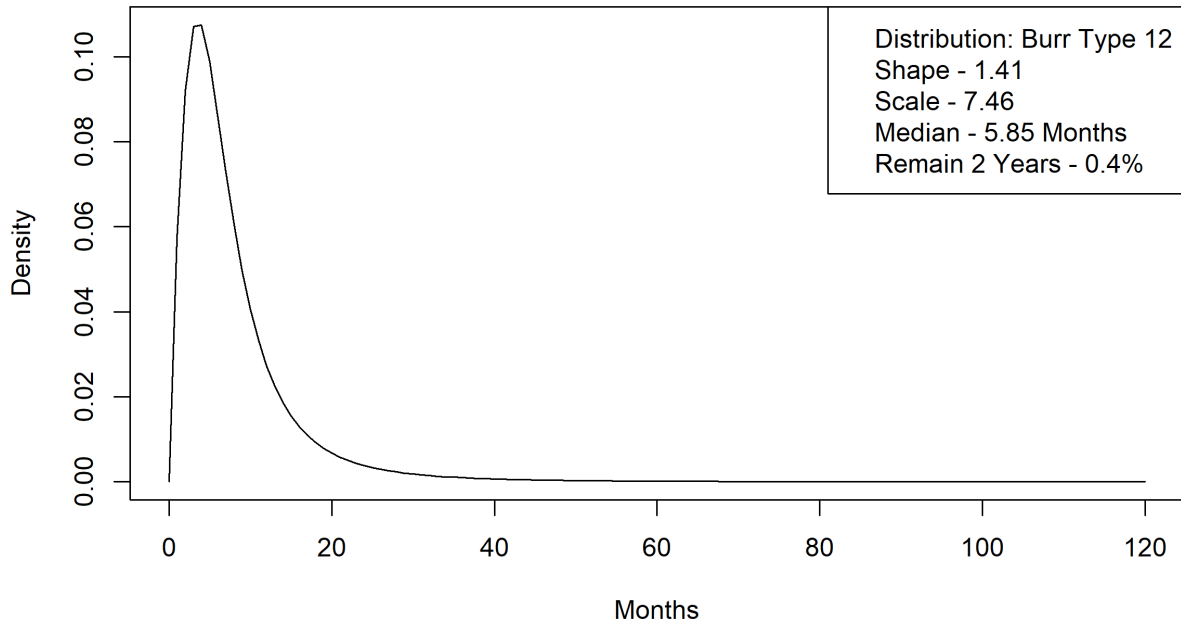


Figure 6A.85 Holding Times: NF 91+ to No LTSS to NF 30-90

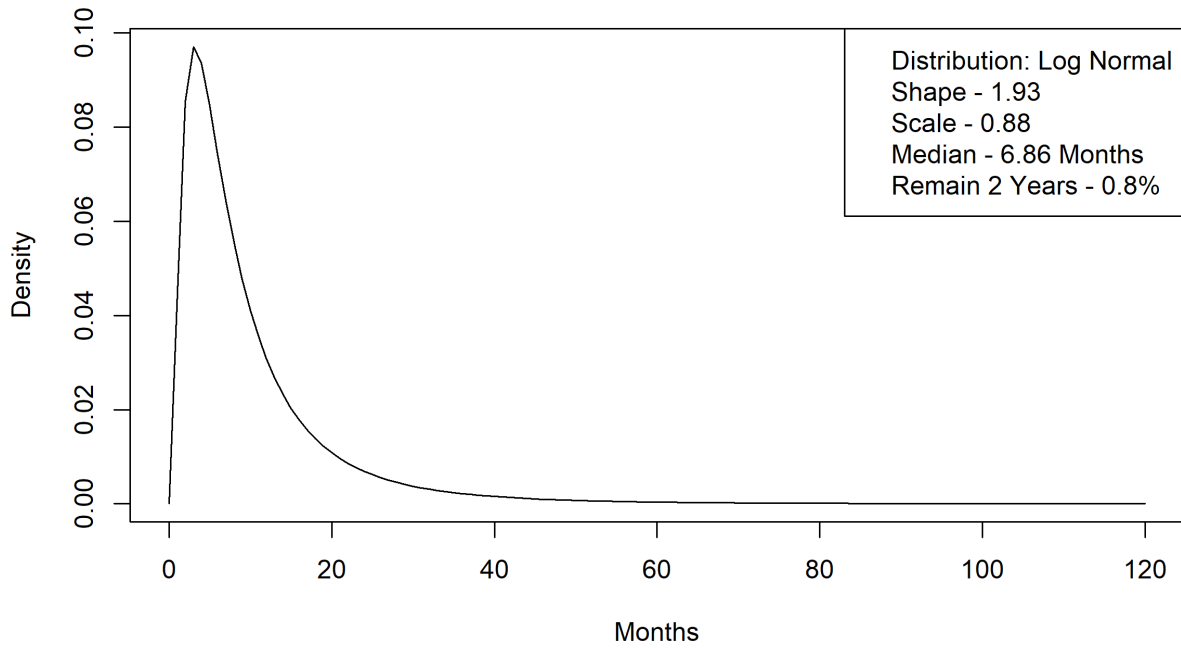


Figure 6A.86 Holding Times: NF 91+ to No LTSS to NF 91+

