Long-Term Care Population Research Model—Methodology

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Methodology

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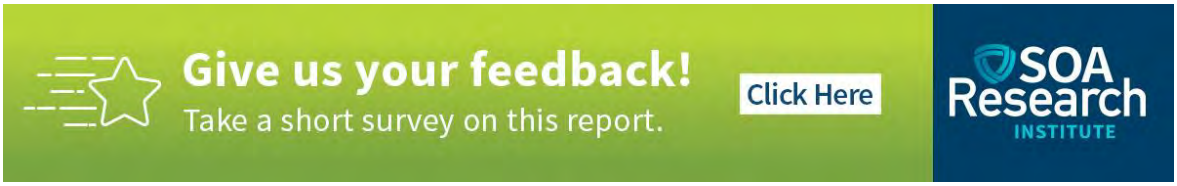

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Long-Term Care Population Research Model

Methodology

The Society of Actuaries (SOA) Long-Term Care Population Research Model (LTC Population Research Model) is an Excel-based model[1] which examines the impact of a public long-term care (LTC) menu of benefits on beneficiary finances and service utilization. The model allows the user to define a menu of benefits by specifying various parameters. The model analyzes the potential impacts of the benefits on LTC utilization and expenditures for illustrative purposes on episodes of LTC need based on 2018 experience data. These impacts are summarized and provided as output for user review. In addition, the model provides a high-level financing estimate, in terms of a payroll tax, to provide context to the cost of the benefits.

This document outlines the methods used to develop the SOA's LTC Population Research Model. This model utilizes an individual-level dataset of LTC episodes to simulate the impact of a public LTC program on:

- Beneficiary finances,
- Current LTC payors, and
- Informal caregiving

The model is intended to be used for illustrative research purposes only. Results are intended to educate users on the relative utilization and expenditures of LTC services for various subsets of the population and provide estimates of the relative impacts of a menu of benefits on beneficiary LTC utilization and finances. The model should not be used to:

- Determine the financing requirements of a proposed long-term care benefit program
- Generate assumptions or numbers to be relied on in a third-party analysis
- Provide support for financial or policy decisions

For information on operating the model, please refer to the document, *Long-Term Care Population Research Model User Guide*.

[1] Note, the 64-bit version of Excel is required to run the model. The 32-bit version of Excel will produce an 'Out of Memory' error when attempting to run the underlying macros.

Intended Use

The LTC Population Research Model was developed in order to examine potential impacts of LTC benefits made available through public finance approaches at the federal level. The impacts include those on beneficiary finances, current LTC payors, and informal caregivers. The model estimates the impact of user-defined benefits on episodes of LTC need that were reported in 2018 survey data. The benefits are applied to all episodes and do not make assumptions regarding eligibility requirements. The model was developed for research purposes and should be used for educational and research purposes ONLY. It is intended as a tool for understanding the population need for LTC services and the potential impacts of providing public LTC benefits for those needing LTC services. Model output can be used to examine: (1) the relative impacts of a selection of benefits on various subsets of the national population and (2) general relationships between program inputs and model outputs.

The model should be used to gain a general understanding of concepts such as:

- Demographics of the disabled population in the United States
- How those with an LTC need receive care (formal vs. informal)
- Current sources of financing for long-term care expenditures
- Relative impacts of publicly available benefits on service utilization and individual finances for various cross-sections of the population

As part of the model development, steps have been taken to control various aspects of the data to published sources.

The intended users of this model include actuaries, researchers, and other parties interested in understanding generalized impacts of the availability of LTC benefits at a federal level. It is helpful for users of the model to have familiarity with LTC projection concepts. As stated previously, the estimates generated from the model should not be used to make public policy or financial decisions.

Caveats and Limitations

There are a number of simplifying assumptions inherent in the calculations performed by the model.

The model generates broad estimates of the payroll tax necessary to fund public LTC program benefits on a nationwide basis for those benefits specified by the user. These estimates are intended to be informative in terms of the approximate level of cost necessary to fund a given level of benefits in order to allow users to consider both costs and benefits. The estimates generated by the model should be used for research purposes only and should not be relied upon to make decisions related to any specific program funding. Payroll tax estimates are generated using a 75-year projection of benefits administered to the US population from 2023-2098. This projection contains a number of assumptions discussed in this document.

Interaction between payors of LTC services is complex, and detail on these interactions is not available in the data used to build the model. Estimates of Medicaid and out-of-pocket (OOP) expenditure reductions are calculated assuming that program benefits directly offset spending in the following order: (1) Medicaid expenditures and (2) OOP expenditures. Any additional benefit above current beneficiary Medicaid or OOP expenditures is considered an incremental benefit for an individual, assuming they are eligible for the additional amount of benefit based on the length of their LTC episode.

In defining episodes for the purposes of this model, community and facility episodes are considered separately, although in many cases individuals will transfer between care settings during the course of care need. The model does not account for transfers when examining the potential impacts of a program on LTC episodes.

Section 1: Model Overview

The SOA LTC Population Research Model is an Excel-based model which allows a user to define a menu of LTC benefits at the federal level financed through a payroll tax. The model analyzes potential impacts of the benefits on individual-level records of LTC episodes reported in 2018 survey data. These impacts are summarized and provided as output for user review.

Users are able to specify benefits by defining:

1. The level of disability necessary to qualify for benefits
2. Benefit parameters including elimination period, daily benefit amount, and benefit period
3. Financing assumptions

The model uses these inputs to estimate potential impacts of the specified benefits on beneficiary finances, Medicaid and OOP expenditures, and informal caregiving. Results are displayed in various output tables.

In order to simulate the potential impacts, the model utilizes a nationally representative dataset of LTC episodes occurring in 2018. This dataset was constructed using multiple data sources and includes information on demographics, finances, level of disability, length of episode, informal care utilization, and LTC expenditures by different sources of payment. In defining episodes for the purposes of this model, community (e.g., home care, adult day care, etc.) and facility (e.g., nursing facility, personal care facility, etc.) episodes are considered separately, although in many cases individuals will transfer between care settings during the course of a care need.

Section 2 of this document discusses the methodology used to develop the LTC Episode (LTCE) dataset used to simulate the impacts of user-defined benefits.

Section 3 explains the parameters that can be modified by the user to specify benefits.

Section 4 outlines the methodology used to simulate impacts on beneficiary LTC utilization and expenditures.

Section 5 describes the output generated by the model and how output should be interpreted.

Section 2: LTC Episode Data

This section describes the development of the episode-level data that is the basis of calculations in the LTC Population Research Model.

2.1 SUMMARY

The LTC Population Research Model utilizes a person-level dataset to simulate the impact of a public LTC benefit on beneficiary finances, current LTC payors, and informal caregivers. This dataset contains demographic, financial, and LTC utilization data for the United States population, ages 18 and older. This is termed the LTC Episode (LTCE) dataset.

The LTCE dataset is intended to provide a plausible set of LTC episodes that can be used to illustrate the potential impacts of public LTC program proposals on various beneficiary subpopulations. Producing this dataset involves a number of assumptions which were determined using actuarial judgement and currently available data. The dataset is not intended to be relied on for pricing, reserving, or any other financial exercise. It is meant to be used as a research tool that can provide insight into population LTC needs and the potential beneficiary impacts of a given LTC benefit.

The information needed to construct the LTCE dataset used by the Population Research Model is not available in any singular dataset, so it was necessary to combine information from multiple datasets. The LTCE dataset was constructed using the following survey data from 2018:

- Medical Expenditure Panel Survey—Household Component (MEPS-HC), 2018[2]
- Medicare Current Beneficiary Survey (MCBS), 2018[3]
- Health and Retirement Study (HRS), RAND HRS Longitudinal File 2018 (V1)[4]
- National Health Interview Survey (NHIS), 2018[5]
- Survey of Income and Program Participation (SIPP), 2018[6]

Each of these surveys contains unique information that was used to construct person-level records with information about LTC episodes. Given the intended scope of the model, the model does not attempt to account for variance inherent in the responses to survey data. The following table summarizes the layout of the LTCE dataset.

[2] Agency for Healthcare Research and Quality. Medical Expenditure Panel Survey Household Component Overview. *MEPS*, Dec. 2, 2022, *https://meps.ahrq.gov/survey_comp/household.jsp.*

[3] Centers for Medicare and Medicaid Services. Medicare Current Beneficiary Survey (MCBS). *CMS,* Nov. 27, 2023, *https://www.cms.gov/data-research/research/medicare-current-beneficiary-survey.*

[4] University of Michigan Institute for Social Research. Rand HRS Longitudinal File 2018 (V1). *Health and Retirement Study*, Mar. 16, 2021, *https://hrs.isr.umich.edu/news/data-announcements/rand-hrs-longitudinal-file-2018-v1*.

[5] Centers for Disease Control and Prevention. National Health Interview Survey. *National Center for Health Statistics*, Dec. 8, 2023, *https://www.cdc.gov/nchs/nhis/1997-2018.htm.*

[6] US Census Bureau. Survey of Income and Program Participation (SIPP). Census Bureau, Feb. 21, 2024, https://www.census.gov/programs-surveys/sipp.html.

Table 1
LTCE DATASET LAYOUT

Field Name	Description
LTCEID	LTCE record ID
AGE	Age at the end of 2018
SEX	Sex
REGION	Region of residence at the end of 2018
INDINC	Individual Income
FAMINC	Family Income
MCD_IND	Medicaid Indicator
HH_NETWORTH	Household Net Worth
HH_NH_NETWORTH	Household, Non-Housing Net Worth
ADL_COUNT	Number of ADL disabilities[7]
SCI	Presence of Severe Cognitive Impairment
PRIV_IND	Presence of Private LTCI Coverage
INF_CARE	Presence of Informal Care
CARE_SETTING	Care Setting (Community or Institution)
LOE	Length of Disability Episode
TOT_18	Total LTC Expenditures, 2018
MCD_18	Medicaid LTC Expenditures, 2018
MCR_18	Medicare LTC Expenditures, 2018
PRV_18	Private LTCI LTC Expenditures, 2018
OOP_18	Out-of-Pocket LTC Expenditures, 2018
OTH_18	Other Sources LTC Expenditures, 2018
TOT_EXP	Total Lifetime LTC Expenditure
MCD_EXP	Medicaid Lifetime LTC Expenditure
MCR_EXP	Medicare Lifetime LTC Expenditure
PRV_EXP	Private LTCI Lifetime LTC Expenditure
OOP_EXP	Out-of-Pocket Lifetime LTC Expenditure
OTH_EXP	Other Sources Lifetime LTC Expenditure
WEIGHT	Record weight

The disabled population is divided into two subsets, Community and Institutional/Facility, based on the availability of the data reported in each survey. The community population includes the civilian, non-institutionalized population[8] living in the community. The facility population includes those residing in a nursing facility, personal care facilities, and assisted living facilities.

For the purposes of the LTC Population Research Model, the LTCE dataset excludes ages below 18.

The MEPS-HC and MCBS were used as the primary data source for the Community and Institutional populations, respectively. Data items that were not present in the primary data source were imputed using stratified random

[7] The ADLs considered in the survey data are consistent with the HIPAA ADLs typically used in private insurance.
[8] All U.S. civilians not residing in institutional group quarters facilities such as correctional institutions, juvenile facilities, skilled nursing facilities, and other long-term care living arrangements. (Census Glossary. (n.d.). https://www.census.gov/glossary/?term=Civilian+noninstitutionalized+population).

sampling of records from supplementary data sources. Strata were defined using as many common variables as possible while ensuring that all strata in the primary data source had at least one corresponding data point in the imputation data source. The following table outlines the data sources used to construct each of the subpopulations that make up the final LTCE dataset.

Table 2
SUMMARY OF DATA SOURCES BY POPULATION

Care Setting	Community	Institutional
Primary Dataset	MEPS-HC	MCBS
Variable Source		
Age Group	MEPS-HC	MCBS
Sex	MEPS-HC	MCBS
Region	MEPS-HC	MCBS
Income	MEPS-HC	MCBS
Assets	SIPP (Imputation)	MCBS (Imputation)
ADL Disability	NHIS (Imputation)	MCBS
Cognitive Impairment	NHIS (Imputation)	MCBS
Length of Episode	HRS (Imputation)	MCBS
Medicaid Coverage	MEPS-HC	MCBS
Private LTCI	HRS (Imputation)	MCBS
Informal Care Utilization	MCBS (Imputation)	MCBS
Expenditures by Payor	MEPS-HC	MCBS

2.2 DATA SOURCES OVERVIEW

2.2.1 MEPS-HC

The Medical Expenditure Panel Survey (MEPS) is a set of large-scale surveys of families and individuals, their medical providers, and employers across the United States. The MEPS Household Component (MEPS-HC) fields questionnaires to individual household members to collect nationally representative data on demographic characteristics, health conditions, health status, use of medical care services, charges and payments, access to care, satisfaction with care, health insurance coverage, income, and employment. The MEPS-HC is administered to the non-institutional population, so it contains information about disability and home health services.

The MEPS-HC was used as the primary data source for the Community population.

2.2.2 MCBS

The Medicare Current Beneficiary Survey (MCBS) is a continuous, in-person, multi-purpose longitudinal survey of a nationally representative sample of the Medicare population. The MCBS consists of a sample of beneficiaries residing in the United States aged 65 and over or aged 64 and below with disabilities. The MCBS is compiled using both survey and administrative data. The data includes demographic, disability, and financial information on both community and facility residents.

The MCBS was used as the primary data source for the Institutional population. It was also used to impute informal care status onto the Community records.

2.2.3 RAND HRS

The HRS is a national panel survey of individuals over age 50 and their spouses. The survey contains information about demographics, income, assets, health, cognition, family structure and connections, health care utilization and costs, housing, job status and history, expectations, and insurance. The RAND HRS Longitudinal File is utilized to access the HRS data. The RAND HRS Longitudinal File is a cleaned and consolidated dataset containing information from Core and Exit Interviews of the Health and Retirement Study (HRS).

The RAND HRS dataset was used to impute private LTCI coverage and disability length of episode onto the Community records. In the survey, respondents are asked to indicate whether they have long-term care coverage. It is not explicitly stated that this question includes combo products (life or other coverage with an LTC benefit rider). Based on the general nature of the question, the model assumes coverage includes all products.

2.2.4 NHIS

The NHIS is an annual survey of the civilian, noninstitutionalized population which collects data on demographic information, income, activities of daily living (ADLs), cognitive impairment, home care utilization, and the presence of Medicaid coverage and private LTC coverage. This survey covers the entire adult noninstitutional population.

The NHIS was used to impute level of disability onto the population identified as ADL-disabled in the MEPS-HC. The Person File was used as the basis for information used to construct the LTCE dataset. The NHIS was redesigned in 2019, and the ADL information collected prior to 2019 is no longer available. Due to this change, the 2018 NHIS data release was used for imputation of level of disability.

2.2.5 SIPP

The Survey of Income and Program Participation (SIPP) was used as a source for imputing net worth information for the Community aged 18-64 population. The SIPP is a nationally representative longitudinal survey that contains detailed income, asset, and government program participation information.

2.3 COMMUNITY DATA

2.3.1 PRIMARY DATASET – MEPS-HC

The MEPS-HC was used as the primary data source for the Community population because it contains detailed home health expenditure information.

Age and Sex

The MEPS-HC reports age and sex for all respondents. However, the age variable is top-coded at 85 to preserve respondent confidentiality. This means that the LTCE dataset contains community information for single-year ages 18-84 and the group, age 85+.

Region

Region at the end-of-year status was used to identify the survey respondents' area of residence. The regions reported in the MEPS-HC are consistent with the Census regions outlined in Table 3.

Table 3
CENSUS REGION DEFINITIONS

Region Number	Region Name	States
1	Northeast	Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont
2	Midwest	Indiana, Illinois, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin
3	South	Alabama, Arkansas, Delaware, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia
4	West	Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming

Income

Income is reported in the MEPS-HC in total and at the income-component level. All income amounts are top-coded to preserve confidentiality of program respondents, and the MEPS-HC imputes income amounts for non-response or incomplete response. Both individual income and household income variables were included in the LTCE dataset.

Medicaid Coverage

The MEPS-HC collects data on monthly Medicaid/State Children's Health Insurance Program (SCHIP) eligibility. The survey is intended to capture both fee-for-services (FFS) Medicaid and Medicaid managed care enrollees. The survey variable that indicates the presence of Medicaid coverage at any time during the year was used to indicate Medicaid eligibility for the LTCE dataset.

ADL Disability

Private long-term care insurance typically ties benefit eligibility to the need for substantial assistance with two or more of the activities of daily living (ADLs) defined in the Health Insurance Portability and Accountability Act (HIPAA)[9]. HIPAA defines the following six ADLs:

- Bathing
- Dressing
- Transferring
- Toileting
- Continence
- Eating

To qualify for benefits under a tax-qualified plan LTCI, an individual must require assistance with at least two of the six HIPAA ADLs, where the condition is expected to last 90 days or more or have severe cognitive impairment.

[9] Health Insurance Portability and Accountability Act of 1996, Pub. L. No. 104-191 (1996), https://www.govinfo.gov/app/details/PLAW-104publ191.

The MEPS-HC respondents indicate whether individual ADL assistance is needed by responding to the question:

> *Does anyone in this household receive help or supervision with personal care such as bathing, dressing, or getting around the house because of an impairment or a physical or mental health problem?*

This information indicates whether or not an individual needs help with one or more ADLs or has severe cognitive impairment, but it does not provide details of an individual's level of disability. In addition, it does not specifically ask about toileting, continence, or eating. This does not allow for evaluation of the HIPAA trigger.

Home Health Expenditures

The MEPS-HC is the source of home health care expenditures for the Community population. MEPS-reported home health care includes services received due to a health problem or condition. These services may be medical (e.g., physical therapy; checking temperature, blood pressure, pulse, and respiration rates; or helping to give medications) or personal (e.g., cleaning, repairs, cooking, or companionship). MEPS-HC expenditures refer to what is paid for health care services. MEPS-HC expenditures are defined as the sum of direct payments for care provided during the year, including OOP payments and payments by private insurance, Medicaid, Medicare, and other sources.[10]

Data on expenditures for home health care not provided by an agency is collected through MEPS-HC survey responses. Data on expenditures for care provided by home health agencies is collected in the MEPS Medical Provider Component (MPC). This MPC collects data from a sample of providers who administer care. Additional information regarding expenditure reporting can be found in the document, *MEPS HC-209 2018 Full Year Consolidated Data File* (August 2020).[11]

Home health expenditures are reported for the following channels of payment:

- OOP
- Medicare
- Medicaid
- Private Insurance
- Veteran's Administration
- TRICARE
- Other Federal Sources
- Other State and Local Sources
- Worker's Compensation
- Other Private
- Other Public
- Other Unclassified Sources

The LTCE dataset collapses Private, Other Private, and Other Unclassified Sources into a single Private category. These are the fields that contain either private pay from a health plan or private pay from an LTC insurance policy. Note, that the Private Insurance category is supposed to correspond to payments from a health plan (medical only). While health plans do not cover long-term care, it is possible that they could cover portions of a care episode, and it is possible that survey respondents reported private expenditures that correspond to LTC insurance as opposed to

[10] Agency for Healthcare Research and Quality. MEPS HC-209 2018 Full Year Consolidated Data File. *MEPS,* Aug. 2020, https://meps.ahrq.gov/data_stats/download_data/pufs/h209/h209doc.pdf, p. C-103.
[11] Agency for Healthcare Research and Quality. MEPS HC-209 2018 Full Year Consolidated Data File. *MEPS,* Aug. 2020, https://meps.ahrq.gov/data_stats/download_data/pufs/h209/h209doc.pdf.

health plan expenditures. The VA, TRICARE, Other Federal Sources, Other State and Local Sources, Worker's Compensation, and Other Public categories are grouped into an "Other" category.

Table 4 shows the 2018 totals for home health spending for the community population.

Table 4
HOME HEALTH EXPENDITURES BY SOURCE OF PAYMENT, 2018 (BILLIONS OF DOLLARS)

Total	Medicaid	Medicare	Private	OOP	Other
88.9	39.9	31.5	5.3	8.3	3.9

2.3.2 IMPUTATION

The following information was imputed onto each MEPS-HC record:

- Household Net Worth/Household, Non-Housing Net Worth
- Disability and Functional Limitation
- Disability Length of Episode
- Private LTCI Coverage
- Informal Care

Stratified random sampling was used to perform imputation. This process was used in order to preserve the empirical distributions of the variables of interest that are found in the various data sources. First, the MEPS-HC and imputation dataset were reviewed for common variables by which to stratify the populations. Strata were selected based on our judgement of the explanatory impact on the variable that was being imputed. Once stratification was complete, random sampling with replacement was used to select a record from the imputation dataset for each record in the same stratum in the primary dataset.

Actuarial judgement was used to determine the strata used for sampling, balancing the desire to use as many strata as possible with sample size considerations. Important considerations include:

1. Each dataset must contain at least one record in each stratum.
2. The distribution of population weight by stratum should be roughly similar in each dataset to avoid over/under-sampling issues.

With these limitations in mind, variables were chosen given explanatory impact on the imputation variable. For example, when imputing the number of ADLs for a record indicating ADL disability, NHIS records are stratified by age, sex, and the presence of home health care. The inclusion of strata for region and the presence of Medicaid coverage were considered but deemed not feasible due to sample size constraints. These variables were not used because it is assumed that they are less likely to be correlated to level of disability than age, sex, and home health care utilization.

Once imputation was performed, distributions of the imputed data were compared to the source dataset to ensure that the relationships of relevant variables were preserved (for example, the level of disability versus age, sex, and income). The extent to which distributions were consistent depended on the granularity of the strata used for the imputation and the number of observations in each dataset. In general, greater numbers of imputed data points led to more consistency between the imputed distribution and base data source distribution.

Random sampling was performed using defined random seeds[12] to allow for replication of imputation results. Actuarial judgement was used to choose the seeds to reproduce the distributions of the imputation dataset to a reasonable extent. Multiple seeds were tested for each imputation, and seeds were selected resulting in the post-imputation distribution looking reasonably consistent with the distribution from the imputation data source.

There are other ways to estimate the correlation of various strata to the imputation variable. However, this imputation method ensures that the resulting dataset contains relationships that are consistent with all underlying source data. Given the goal of the project is to provide approximate impacts of national public benefits and resource considerations, this method provides an appropriate level of robustness for imputation.

The remainder of this section describes the specific variables that were imputed for the LTCE dataset.

Net Worth

The SIPP was used to impute household net worth information onto the MEPS-HC records. Net worth is the sum of asset values minus the sum of liabilities for a person or family. The SIPP was used to calculate both net worth and non-housing net worth for households. Non-housing net worth was estimated as net worth minus equity in primary residence (value of home minus value of home debt).

The strata used for asset imputation are outlined in Table 5.

[12] A random seed is a defined number used to initialize a pseudorandom number generator. Knowing the seed for the pseudorandom number generator will allow a user to reproduce the same sequence of random numbers at any time.

Table 5
COMMUNITY HOUSEHOLD NET WORTH IMPUTATION STRATA

Category	Strata
Age Group	• 18-24 Years • 25-34 Years • 35-44 Years • 45-54 Years • 55-64 Years • 65-69 Years • 70-74 Years • 75-79 Years • 80-84 Years • 85+ Years
Sex	• Male • Female
Region	• Northeast • Midwest • Southwest • West
Income Group (Person-Level)	• Less than $25,000 • $25,000-$49,000 • $50,000-$74,999 • $75,000-$124,999 • $125,000 or More
Medicaid Status	• Medicaid-eligible • Not Medicaid-eligible

Table 6 shows the distribution of household net worth in the 2018 SIPP data compared to the LTCE dataset distribution resulting from imputation. Appendix B contains additional comparisons of the net worth distributions by characteristics such as age group and sex.

Table 6
COMPARISON OF COMMUNITY HOUSEHOLD NET WORTH DISTRIBUTIONS

Household Net Worth ($)	SIPP	LTCE
Less than or equal to 50,000	37.3%	41.0%
50,000-99,999	9.0%	7.7%
100,000-499,999	29.1%	27.0%
500,000-999,999	10.9%	11.1%
1,000,000 and over	13.7%	13.1%

Level of ADL Disability/Cognitive Impairment
The MEPS-HC respondents indicate whether individual ADL assistance is needed by responding to the question:

> *Does anyone in this household receive help or supervision with personal care such as bathing, dressing, or getting around the house because of an impairment or a physical or mental health problem?*

While this is useful in determining the population that needs assistance with ADLs, it does not provide detail about the severity of the disability. Disability severity is typically measured in terms of the number of ADLs for which assistance is needed and the presence of severe cognitive impairment. The NHIS provides information on five ADLs

and the presence of senility (dementia or Alzheimer's disease). For this reason, NHIS data was used to impute the severity of disability for MEPS records. This survey asks the following questions of respondents:

Does - - need help with Bathing/Dressing/Eating/Using Toilet/Getting in and out of bed, chairs?

Does - - have a limitation due to senility?

While the NIHS questions contain more ADL-specific detail than the MEPS-HC, we view this as a less restrictive definition of ADL disability than the MEPS-HC question because the MEPS-HC specifically asks whether help or supervision is currently present. This distinction is reflected in the total counts of individuals flagged as having an ADL disability between the two surveys:

Table 7
ADL/CI DISABILITY COUNTS, NHIS VS. MEPS-HC

Survey	Population Aged 18 with ADL/CI Disability
NHIS	6,432,719
MEPS-HC	4,670,971

ADL disability was imputed using strata for age group, sex, and home health utilization.

Table 8
COMMUNITY ADL IMPUTATION STRATA

Category	Strata
Age Group	• 18-29 Years • 30-44 Years • 45-64 Years • 65-69 Years • 70-74 Years • 75-79 Years • 80-84 Years • 85+ Years
Sex	• Male • Female
Home Health Utilization	• None • Less than 15 days per month • More than 15 days per month

The 2018 NHIS contains 1,529 records indicating 1+ ADL or cognitive impairment while the 2018 MEPS-HC contains 505 records indicating an ADL limitation. Due to the small number of ADL-disabled records relative to the number of possible age/sex/region/income/Medicaid/etc. strata, the resulting LTCE ADL distributions are approximate representations of what is found in the NHIS.

Table 9 shows the distribution of ADL count present in 2018 NHIS data compared to the LTCE dataset distribution resulting from imputation. Appendix B contains additional comparisons of ADL distributions by characteristics such as age group and sex.

Table 9
COMPARISON OF COMMUNITY ADL DISTRIBUTIONS

ADL Count	NHIS	LTCE
1	24.1%	21.5%
2	23.0%	25.9%
3+	52.9%	52.7%

The imputation results in fewer individuals with one ADL and more individuals with two ADLs, driven by differences in the proportion of the disabled population indicating utilization of home health coverage between the NHIS (27%) and MEPS-HC (37%). A greater percentage of the MEPS-HC disabled population utilizes home health coverage, and home health is associated with more severe levels of disability. This difference is likely attributable to the stricter definition of ADL disability present in the MEPS-HC.

Private Long-Term Care Insurance
The MEPS-HC provides home health expenditures by channel of payment, so it is assumed that individuals with an ADL disability who have home health care paid by the Other Private or Other Unclassified Sources categories are covered by private LTC.

For individuals who do not have home care and an ADL disability, private LTCI coverage was imputed using the RAND HRS dataset. Because the RAND HRS provides data on the 50+ population and over 75% of LTCI is purchased by individuals over 50, we made the simplifying assumption that the population younger than 50 does not have private LTCI coverage.[13]

RAND HRS respondents are asked both about the presence of private LTCI coverage as well as LTCI premiums. Data regarding the question about *coverage* alone implies that over 10 million individuals were covered by private LTCI. However, this is higher than industry estimates suggesting approximately 7.5 million LTCI policyholders across both standalone and linked benefits, and researchers suggest this is likely due to HRS participant response error.[14] Some respondents indicated that their LTCI coverage was part of another medical insurance policy. Because LTC services are not generally covered by other medical policies, it is assumed that these respondents were not, in fact, covered by LTCI and were not counted as LTCI policyholders. Based on this assumption, the HRS Wave 13 responses indicate 6.9 million individuals reporting LTCI and a corresponding policy premium.

For individuals 50+ years old, LTCI coverage was imputed using sex, individual net worth, disability status, and Medicaid status.

[13] American Association for Long-Term Care Insurance. Long Term Care Insurance Facts – Data – Statistics – 2020 Report. *AALTCI*, 2023, *https://www.aaltci.org/long-term-care-insurance/learning-center/ltcfacts-2020.php.*
[14] Johnson, Richard. Who is Covered by Private Long-Term Care Insurance? *Urban Institute*, Aug. 2016, https://www.urban.org/sites/default/files/publication/83146/2000881-Who-Is-Covered-by-Private-Long-Term-Care-Insurance.pdf.

Table 10
COMMUNITY PRIVATE LTCI IMPUTATION STRATA

Category	Strata
Sex	• Male • Female
Individual Net Worth	• Less than $50,000 • $50,000-$99,999 • $100,000-$499,999 • $500,000 or more
Disability Status	• 1+ ADLs or Cognitive Impairment • No ADLs or Cognitive Impairment
Medicaid Status	• Medicaid-eligible • Not Medicaid-eligible

Table 11 shows the distribution of private LTCI coverage among individuals with at least one ADL or severe cognitive impairment in 2018 HRS data compared to the LTCE dataset distribution resulting from imputation. Appendix B contains additional comparisons of the private LTCI distributions by characteristics such as age group and sex.

Table 11
COMPARISON OF COMMUNITY PRIVATE LTCI DISTRIBUTIONS

Private LTCI	HRS (2018)	LTCE
No	93.2%	93.5%
Yes	6.9%	6.5%

The total number of LTCI policyholders in the LTCE dataset is approximately 7.2 million. This includes both community and institutional residents. This figure is in line with estimates of covered lives produced by the American Association for Long-Term Care Insurance (AALTCI). The following table compares the Private LTCI coverage statistics present in the LTCE dataset with various AALTCI statistics.

Table 12
PRIVATE LTCI STATISTICS

Statistic	LTCE Estimate (2018)	AALTCI Estimate
LTCI Covered Lives	7.2 million	7.5 million (2020) [15]
LTCI Claimants	368,000[16]	303,000[17]
LTCI Claim Payments	$2.2 billion	$10.3 billion[16]

The estimate of covered lives in the LTCE dataset is consistent with AALTCI statistics, while the estimate of LTCI claimants is approximately 21% higher. However, estimated claim payments from private insurers of $2.2 billion are 80% lower than the $10.3 billion reported by the AALTCI.

This discrepancy is significant and merits additional investigation. Given that the number of LTCI covered lives and claimants are comparable, it is likely the MEPS-HC and MCBS data are missing private claim dollars attributable to records indicating private coverage. According to the 2019 Milliman LTCI Brokers Survey,[18] Nursing Home and ALF claims accounted for almost 67% of LTCI claims dollars in 2018. This would imply private claim payments of $3.4 billion for community residents and $6.9 billion for facility residents. The following table compares these amounts to LTCE dataset private 2018 expenditures associated with community residents with 2+ ADLs or cognitive impairment and facility residents.

Table 13
PRIVATE LTCI CLAIMS ESTIMATE COMPARISON

Care Setting	AALTCI LTCI Claims Estimate ($B)	LTCE Survey Claims ($B)	Difference ($B)
Community	3.4	1.3	2.1
Facility	6.9	0.8	6.1

The community expenditures reported in the MEPS-HC are collected through the household survey for non-agency utilization and through both the household and MPC survey for agency utilization. It is possible that the non-agency portion omits private claims because the responses are not validated using administrative data. This could be a source of the discrepancy of private expenditures. Similarly, the MCBS does not use administrative data to validate non-Medicare payors. Survey-reported data for services covered by other payers, such as Medicare Advantage (MA), Medicaid, private payers, and other payer sources are not matched to administrative data.[19]

To account for the shortfall in LTCI claims, LTCI expenditures were adjusted to match the $10.3 billion claims amount reported by AALTCI, based on the shortfall for community and facility, respectively. We assumed that the minimum daily private benefit was $40 for community care and $275 for facility care. Records with nonzero, private

[15] American Association for Long-Term Care Insurance. Long-Term Care Insurance Facts – Data – Statistics – 2020 Report. *AALTCI*, 2023, https://www.aaltci.org/long-term-care-insurance/learning-center/ltcfacts-2020.php.
[16] All facility records and community records with private expenditures and 2+ ADLs or CI.
[17] American Association for Long-Term Care Insurance. Long-Term Care Insurance Facts – Data – Statistics – 2019 Report. *AALTCI*, 2023, *https://www.aaltci.org/long-term-care-insurance/learning-center/ltcfacts-2019.php#top.*
[18] Claude Thau, Allen Schmitz, FSA, MAAA and Chris Giese, FSA, MAAA. 2019 Milliman Long Term Care Insurance Survey. *Broker World*, Jul. 1, 2023, https://brokerworldmag.com/2019-milliman-long-term-care-insurance-survey/,
[19] Centers for Medicare and Medicaid Services. MCBS Advanced Tutorial on Using Community and Facility Data. *CMS*, Jul. 15, 2022, *https://www.cms.gov/files/document/mcbs-advanced-tutorial-using-community-and-facility-data.pdf.*

expenditures and implied daily benefit amounts below these thresholds were adjusted to increase private expenditures so that their implied daily benefit equaled these thresholds

Informal Care

Informal care is measured in the MEPS-HC. However, the reported levels are relatively low compared to the estimated prevalence of unpaid care from other sources. Specifically, MEPS-HC tabulations indicate that 7.8% of the ADL disabled, home health population received informal care in 2018. According to research published by George Washington University, two thirds of community residents over the age of 65 use informal care exclusively.[20] An NCBI study found that nearly all community residents with an LTC need receive some sort of informal care.[21] In addition, the informal care reported in the MEPS is not specific to ADL activities.

Informal care utilization reported in the MCBS is consistent with the George Washington and NCBI literature and is specific to ADL activities. For these reasons, the MCBS was used as the source for informal care utilization.

The MCBS collects information on helpers for all community respondents. This information includes the nature of the help that was provided, so it was possible to identify help for ADL-specific tasks. Specifically, help for ADL-specific activities was considered informal care in cases where it was provided by a relative, friend, neighbor, guardian, or partner. Care provided by a boarder, nurse, or legal/financial officer was considered to be paid care for the purposes of the LCTE dataset.

Table 14

COMMUNITY INFORMAL CARE IMPUTATION STRATA

Category	Strata
Sex	• Male • Female
Individual Net Worth	• Less than $50,000 • $50,000-$99,999 • $100,000-$499,999 • $500,000 or more
Disability Status	• 1+ ADLs or Cognitive Impairment • No ADLs or Cognitive Impairment
Medicaid Status	• Medicaid-eligible • Not Medicaid-eligible

Table 15 shows the distribution of informal care for the population with an ADL disability in 2018 MCBS data compared to the LTCE dataset distribution resulting from imputation.

[20] O'Shaughnessy, C. Family Caregivers: The Primary Providers of Assistance to People with Functional Limitations and Chronic Impairments. *George Washington University – Himmelfarb Health Sciences Library*, Jan. 11, 2013, https://hsrc.himmelfarb.gwu.edu/sphhs_centers_nhpf/264/.

[21] Freedman, Vicki., & Spillman, Brenda. Disability and Care Needs Among Older Americans. *The Milbank Quarterly*, Sep. 9, 2014, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4221755/.

Table 15
COMPARISON OF COMMUNITY INFORMAL CARE DISTRIBUTIONS

Informal Care	MCBS	LTCE
No	32.0%	31.1%
Yes	68.0%	68.9%

Length of Disability Episode
The RAND HRS dataset was used to estimate the distributions of the length of episode for various levels of disability. These distributions were then used to randomly assign length of episodes to records that reported an ADL disability.

The HRS data reports ADL disability every two years for the following activities:

- Bathing
- Eating
- Dressing
- Transferring
- Toileting

In addition, the HRS reports the diagnoses of:

- Alzheimer's Disease
- Dementia

This information was used to estimate the length of disability episode for HRS records. Note, length of episode is an estimate of the period of disability and not the period during which formal care was received. The survey response was treated as the mid-point of a two-year period and a uniform distribution of incidence of disability or recovery from disability throughout the period is assumed. For example, when an individual reports an ADL disability for the first time, a random number of days between zero and 365 was assigned for the period before the disability was first reported. If the disability was reported in consecutive survey responses, it is assumed that disability occurred for the entire 730-day period between interviews. In the final survey response that disability was reported, a random number of days between zero and 365 was assigned for the period after the disability was last reported.

Table 16
DISABILITY LENGTH OF EPISODE SIMULATION EXAMPLES

Record	2004 Status	Disabled Days 2004-2006	2006 Status	Disabled Days 2006-2008	2008 Status	Disabled Days 2008-2010	2010 Status	Length of Total Episode
Record 1	Healthy	125*	Disabled	730 Days	Disabled	283*	Healthy	1,128 Days
Record 2	Healthy	34*	Disabled	102*	Healthy	0 Days	Healthy	136 Days
…	…	…	…	…	…	…	…	…

* Denotes disabled day amounts that were imputed using random assignment.

Once lengths of episode were imputed for all records, Weibull distributions[22] were fit to the length of episode estimates by age group, sex, and disability status. Distributions were fit using maximum likelihood estimation. The resulting Weibull parameters (shape and scale) were smoothed across age group and disability status to reduce

[22] Weibull distributions are continuous probability distributions that are commonly used in actuarial survival analysis.

noise and produce orderly relationships between the parameters within a stratum (for example, the scale parameters decrease as age increases).

Table 17
LENGTH OF EPISODE IMPUTATION STRATA

Category	Strata
Age Group	• Less than 65 Years • 65-74 Years • 75-84 Years • 85+ Years
Sex	• Male • Female
Disability Status	• Cognitive Impairment • 1+ ADL • 2+ ADLs • 3+ ADLs • 1+ ADL and CI • 2+ ADLs and CI • 3+ ADLs and CI

Appendix B contains the resulting shape and scale parameters for the male population. The distributions were used to estimate lengths of episode for records that indicate an ADL disability by producing a random length of episode from the distribution that corresponds to each record with a reported ADL disability.

Table 18 displays distributional information about the resulting LOEs (Length of Disability Episode) in the LTCE dataset. These distributions are in line with Urban Institute estimates of the duration of LTC need, which were also produced from HRS data.[23]

Table 18
DISTRIBUTION OF AVERAGE LENGTH OF STAY

Length of Episode	< 1 Year	1-2 Years	2-3 Years	3-4 Years	4-5 Years	5+ Years	ALOE (Years)
Community	24%	20%	14%	10%	8%	25%	3.87
Facility	27%	20%	17%	11%	6%	19%	3.11

Lifetime LTC Expenditures

Lifetime LTC expenditures were estimated for the community population using a combination of the annual expenditures reported in the MEPS-HC and MCBS in combination with the imputed disability length of episode.

Lifetime expenditures were estimated by prorating annual expenditures by the factor of 1.0 or the length of episode in years, whichever is less. This calculation assumes that the rate of home care utilization throughout the year will remain constant over the course of the episode and that there is no cost of care inflation over the course of the episode. While these are simplifying assumptions, the survey contains records for individuals who are newly disabled, continuing disabled and concluding disabled. For long episodes, we assume that, on average, the observed record reflects this midpoint of the episode and that adjusting for cost of care and utilization changes is immaterial. If an imputed length of episode is less than one year, the recorded expenditures were not reduced.

[23] Johnson, Richard. What is the Lifetime Risk of Needing and Receiving Long-Term Services and Supports? *Urban Institute*, Apr. 3, 2019. *https://aspe.hhs.gov/reports/what-lifetime-risk-needing-receiving-long-term-services-supports-0, Table*, Table 4.

The basis for the lifetime cost of care in the LTCE dataset is the annual cost of care reported in the MEPS-HC and MCBS. These annual costs of care for Home Health[24] and Nursing Home[25] services can be compared to the National Health Expenditure Accounts (NHEA).[26] Tables 19 and 20 compare annual costs of care for Home Health and Nursing Home services in 2018 National Health Expenditure Accounts (NHEA) data to similar costs in the LTCE dataset.

Table 19
NHEA EXPENDITURES, 2018

Care Setting	Total	Medicaid	Medicare	OOP	Private	Other
Home Health	105.6	35.1	40.5	11.9	14.4	0.8
Facility	167.6	51.5	37.6	43.7	15.5	5.7

Table 20
LTCE EXPENDITURES, 2018

Care Setting	Total	Medicaid	Medicare	OOP	Private	Other
Home Health	91.0	39.9	31.5	8.3	7.4	3.9
Facility	96.6	41.0	0.6	44.0	6.9	4.0

The expenditures for home health are comparable both in aggregate and distribution. Notable differences include lower levels of Medicare and Private spending and higher levels of Medicaid and Other spending.

The expenditures for nursing facilities are comparable for Medicaid, OOP, and Other expenditures but are lower for Medicare and Private. This is likely due to the presence of SNF expenditures for rehabilitative care which are included in the NHEA definition of Nursing Facilities but are not included in the LTCE dataset.

The Congressional Research Service (CRS) provides another useful source for comparison. This service produced a 2022 report that examines who pays for LTC in the United States.[27] The CRS analysis includes payment made for services in nursing facilities and in residential care facilities for individuals with intellectual and developmental disabilities, mental health conditions, and substance abuse issues. While the LTCE dataset does not include expenditure data for many of these populations, it is still useful as a point of comparison. The distribution of expenditures by payor in the LTCE dataset is shown in Table 21. This table includes home health post-acute care that is covered by Medicare.

[24] The home health care component of the NHEA measures annual expenditures for medical care services delivered in the home by freestanding home health agencies (HHAs). NAICS 6216 defines home health care providers as establishments primarily engaged in providing skilled nursing services in the home, along with a range of the following: personal care services; homemaker and companion services; physical therapy; medical social services; medications; medical equipment and supplies; counseling; 24-hour home care; occupational and vocational therapy; dietary and nutritional services; speech therapy; audiology; and high-tech care, such as intravenous therapy.
[25] The nursing care facilities and continuing care retirement communities category includes freestanding facilities that are primarily engaged in providing inpatient nursing, rehabilitative, and continuous personal care services to persons requiring nursing care (NAICS 6231) and continuing care retirement communities with on-site nursing care facilities (NAICS 623311).
[26] Centers for Medicare and Medicaid Services. National Health Expenditure Accounts: Methodology Paper, 2022. *CMS*, 2022, https://www.cms.gov/files/document/definitions-sources-and-methods.pdf.
[27] Congressional Research Services. Who Pays for Long-Term Services and Supports? *CRS Reports*, Sep. 19, 2023, https://sgp.fas.org/crs/misc/IF10343.pdf.

Table 21
DISTRIBUTION OF LTCE EXPENDITURES BY PAYOR, 2018

Care Setting	Total	Medicaid	Medicare	OOP	Private	Other
Community	100%	44%	35%	9%	8%	4%
Facility	100%	42%	1%	45%	7%	4%
Grand Total	100%	43%	17%	28%	8%	4%

Table 22 contains the distribution of LTC expenditures by payor as estimated by the CRS.

Table 22
CRS DISTRIBUTION OF LTC EXPENDITURES BY PAYOR, 2018

Care Setting	Total	Medicaid	Medicare	OOP	Private	Other
All Care Settings	100%	44%	20%	15%	8%	12%

The major differences between the LTCE dataset and CRS distributions are a heavier weighting to OOP and lower weighting towards Other expenditures in the LTCE dataset. This is consistent with expectations for an expenditure distribution that includes primarily ADL-disabled and post-acute care.

The LTCE dataset distribution of expenditures for community records with 2+ ADLs or cognitive impairment and facility records is shown in Table 23. As expected, expenditures for this population are more heavily weighted towards Medicaid and OOP than for the population that includes post-acute care.

Table 23
DISTRIBUTION OF LTCE EXPENDITURES BY PAYOR, 2+ ADL OR COGNITIVE IMPAIRMENT, 2018 DOLLARS

Care Setting	Total	Medicaid	Medicare	OOP	Private	Other
Community	100%	56%	21%	13%	7%	3%
Facility	100%	42%	1%	45%	7%	4%
Grand Total	100%	47%	7%	35%	7%	4%

While there are a number of administrative sources to use in order to gauge the level and distribution of annual LTC expenditures, it is more difficult to find a comparison for the estimates of the lifetime cost of care. PricewaterhouseCoopers (PwC) conducted a study of LTCI claims to estimate the lifetime cost of care for LTC services.[28] Table 24 compares the distribution of formal cost of LTC services estimated by PwC to the distribution of facility and home health claims estimated for LTC beneficiaries in the LTCE dataset. All values correspond to individuals with 2+ ADLs or severe cognitive impairment. While tail values are similar, the PwC estimates of the formal cost of care are higher than those found in the LTCE dataset. At the 50th percentile, the LTCE dataset estimate of the formal cost of care is 43% of the estimate from the PwC study.

[28] PricewaterhouseCoopers. Formal cost of long-term care services. *PWC*, 2017, https://www.pwc.com/us/en/insurance/assets/pwc-insurance-cost-of-long-term-care.pdf.

Table 24
FORMAL COST OF LTC DISTRIBUTIONS, 2018 DOLLARS[29]

Percentile	LTCE	PwC	LTCE as % of PwC
99th	904,605	1,026,438	88%
95th	476,565	625,165	76%
90th	303,925	469,414	65%
75th	151,627	259,584	58%
50th	54,276	115,731	47%
25th	18,576	28,122	66%
10th	5,305	6,490	82%
5th	2,107	2,163	97%

These differences are likely driven by factors related to LTCI:

- The PwC study is conducted solely on private insurance claims and excludes Medicare and Medicaid payments. The population that has LTC insurance claims is a small proportion of total population that has annual LTC expenditures.
- The average claim paid by private LTCI would likely be greater than the average claim paid by Medicare or Medicaid. This is partly due to both coverage differences (Medicare does not cover most LTC expenditures and, on an individual basis, Medicaid covers the population who has spent down assets to meet the eligibility criteria) and lower Medicare/Medicaid reimbursement rates. While government program payments are excluded from the PwC study, Medicare or Medicaid claims are unlikely to make up a significant portion of expenditures for the population covered by private LTCI.

2.4 LTCE—FACILITY DATA

2.4.1 PRIMARY DATA SOURCE

The MCBS was used as the primary data source for the institutional population. Information for the institutional population is obtained from the Facility Events File (FAE). A facility event is considered to be a stay in a nursing home or other LTC facility. Care settings include nursing homes, retirement homes, assisted living facilities, and facilities for mental illness. The Facility Events File contains data about all facility events of the MCBS population, whether community or facility interviews. There is one record for each stay that occurred, at least partly, during the calendar year. The cost and use data contained in the file is limited to the current calendar year.[30]

Facility data is reported for a variety of care settings. For the LTCE dataset, the facility records were limited to the following LTC settings:

- Nursing Home
- Retirement Home
- Personal Care Facility
- Assisted Living Facility (or Residential Care Facility)

While individuals in a retirement home may not require extensive care, these records make up less than 1% of the facility records. The remainder are attributed to the other care settings expected to have significant care needs.

[29] The PwC study reports formal cost of care in 2016 dollars. Amounts are trended to 2018 using an annual 4% inflation factor.
[30] Centers for Medicare and Medicaid Services. Medicare Current Beneficiary Survey (MCBS) Segment Overview. *CMS*, 2013, https://www.cms.gov/Research-Statistics-Data-and-Systems/Research/MCBS/downloads/Segment_Overview.pdf.

Age and Sex
The MCBS reports age and sex for all respondents. The age variable is not top-coded.

Region
The MCBS reports region of residence at various levels of detail. The Census region definition was used because it is consistent with the MEPS-HC region coding.

Income
Both individual and household income are reported in the Income and Assets segment of the MCBS.

Net Worth
The MCBS includes information on the following asset types for both respondents and spouses:

- Home value and amount owed
- 401k Balance
- Stocks, mutual funds, and bonds
- Bank accounts
- Interest and dividend accounts
- Business, farm, or other real estate
- Lump payments
- Automobiles

Net worth and non-housing net worth are calculated at the individual and household level by adding up applicable assets and liabilities reported for each individual/household. The value of non-housing net worth excludes home value and amount owed.

The Income and Asset survey is administered to individuals who are enrolled in the survey by the summer of the survey year. Respondents who are enrolled in the survey after the summer will not have income and asset information. For this reason, imputation was used to impute net worth information for records that were not included in the Income and Asset survey. Assets were imputed using the strata in Table 25

Table 25
FACILITY NET WORTH IMPUTATION STRATA

Category	Strata
Age Group	• 18-24 Years • 25-34 Years • 35-44 Years • 45-54 Years • 55-64 Years • 65-69 Years • 70-74 Years • 75-79 Years • 80-84 Years • 85+ Years
Sex	• Male • Female
Region	• Northeast • Midwest • Southwest • West
Individual Income Group	• Less than $10,000 • $10,000-$24,999 • $25,000-$49,999 • $50,000-$74,999 • $75,000-$99,999 • $100,000-$149,999 • $150,000-$199,999 • $200,000 or More
Medicaid Status	• Medicaid-eligible • Not Medicaid-eligible

Medicaid Status
The MCBS reports Medicaid status by month. If an individual is eligible for Medicaid at any time throughout the year, they are considered Medicaid-eligible in the LTCE dataset.

Disability
The following MCBS fields identify whether the respondent requires help with five of the six HIPAA ADLs:

- Bathing (HELPBATH)
- Dressing (HELPDRES)
- Eating (HELPEAT)
- Toileting (HELPTOIL)
- Transferring (HELPCHAR and HELPWALK)

Transferring is reported both in terms of getting in and out of bed or chairs as well as help with walking.

For cognitive impairment, the MBCS reports whether the respondent has ever been diagnosed with Alzheimer's or Dementia. It is assumed that if the diagnosis was ever made, it is still active.

Private Long-Term Care Insurance
The presence of private LTCI in the institutional population is determined by the expenditure data for each record. If there are expenditures that were paid by private insurance, it is assumed that the individual has private LTCI.

Informal Utilization

Informal care utilization is not applicable to the institutional population. All records correspond to individuals living in facilities and receiving formal care.

Expenditures

Expenditures associated with the institutional stay are reported by channel of payment. All amounts correspond to calendar-year expenses in 2018. The payors reported in the FAE are:

- Medicare
- Medicaid
- Private
- OOP
- Other (including VA)

Section 3: User Input

Users are able to set various parameters in order to define a hypothetical nationwide LTC benefit. These parameters can be grouped into the following categories:

- Benefit Definition
- Financing Assumptions

These inputs are used to (1) simulate the impacts of the user-defined program on finances and LTC utilization of the disabled population reported in the 2018 survey and (2) produce an estimate of the magnitude of payroll tax rate needed to fund the specified program. This section discusses each of the parameters that can be defined through user input. The "User Input" worksheet contains the user interface for defining all parameters.

User Input: Program Parameters

Step 1: Enter Name for Model Run

Scenario Name	Front End - 2 ADL $125

Step 2: Define Program Benefit Used to Estimate Beneficiary Impacts

Covered Benefits	Facility Only
Benefit Trigger - ADL Threshold	2+ ADLs
Benefit Trigger - Severe Cognitive Impairment	Yes
Elimination Period	90 Days
Daily Benefit Amount (2024 Dollars)	$ 250
Benefit Period	1 Year
Benefit Maximum (2024 Dollars)	$ 91,250
Cash vs. Service Reimbursement Benefit	Cash
Home Care Benefit Utilization (Under Service Reimbursement)	100%
Facility Benefit Utilization (Under Service Reimbursement)	100%

Step 3: Define Assumptions Used to Estimate Required Funding[1]

Inflation Protection	3.0%
Eligibility Requirement[2]	Social Security Vesting
Tax Base	Social Security Payroll
Expenses as a % of Benefits	7.0%
Ultimate Interest Rate Assumption (2-6%)	4.7%
Ultimate Wage Growth (4.8% / 3.5% / 2.8%)	3.5%
Tax Estimate (75-Year projection using US population)	0.75%

[1] Inputs for Step 3 only impact the tax estimate. These inputs are not considered when estimating potential beneficiary impacts of the program benefit.

[2] Social Security Vesting is defined as ten years of payroll tax contributions or tax contributions in three of the most recent six years before disability. All Eligible assumes that anyone who meets the benefit trigger is eligible for benefits, regardless of contribution history.

3.1 BENEFIT DEFINITION

The benefit definition section defines the population eligible to receive the modeled LTC benefit as well as the benefit structure. The following parameters can be set to define the benefit that is applied to the disabled records:

- Covered Benefits – Community, Facility, or Both
- Benefit Trigger – Activities of Daily Living (ADL) Threshold

- Benefit Trigger – Severe Cognitive Impairment (CI)
- Elimination Period
- Daily Benefit Amount
- Benefit Period
- Case vs. Service Reimbursement

The combination of care setting eligibility, ADL trigger, and cognitive impairment trigger define the population that the benefit will be applied to in order to examine potential beneficiary impacts. The remaining parameters specify the benefit that would be received by that population.

3.1.1 COVERED BENEFITS

The user indicates whether program benefits are paid for home and community-based services, nursing facility services, or both. The model does not account for transitions between care settings, so estimates of program impact will be specific to the population with a care need based on their care setting at a given point in time. For instance, the episode of care for an individual who is residing in the community is assumed to end in the community. This is a simplifying assumption due to the fact that the data containing reported expenditures did not account for changes in care setting. The model does not assume substitution of care if only one care setting is selected. The model assumes that individuals in the community would not choose to enter a facility setting unless it was necessary for care. Conversely, it is assumed that individuals residing in a facility would not transfer to the community in order to receive the program benefit.

3.1.2 BENEFIT TRIGGER—ADL THRESHOLD

ADL triggers are commonly used to determine eligibility for LTC benefits in the private market. These ADLs are also used in various public programs to aid in determination of benefit eligibility. HIPAA defines six ADLs that can be used to determine benefit eligibility for a tax-qualified LTC Insurance policy. These ADLs are:

- Bathing
- Dressing
- Transferring
- Toileting
- Continence
- Eating

To qualify for benefits under a tax-qualified LTCI plan, an individual must require assistance with at least two of the six HIPAA ADLs, where the condition is expected to last 90 days or more, or have severe cognitive impairment.

The user defines the number of ADLs required to receive benefits under the program being modeled. This field can be set to 1, 2, or 3+ ADLs. The lower the number of ADLs needed to qualify for benefits, the more individuals will be eligible for the benefit. Increasing the number of individuals receiving a benefit will increase the projected cost of a given program.

3.1.3 BENEFIT TRIGGER—SEVERE COGNITIVE IMPAIRMENT

The presence of severe cognitive impairment will trigger benefit eligibility under a tax-qualified LTCI plan and is also used to determine benefit eligibility for many public programs that provide LTC benefits.

In the context of the LTC Population Research Model, severe cognitive impairment indicates the presence of Alzheimer's or dementia. The user is able to indicate whether an individual with severe cognitive impairment will qualify an individual to receive benefits. While there is often overlap in the populations who would qualify for a benefit under the ADL trigger and CI trigger, including those with a cognitive impairment in the population eligible to receive benefits will increase the number of eligible beneficiaries compared to excluding this group.

3.1.4 ELIMINATION PERIOD

The elimination period is the length of time, in calendar days, that must pass between certification of benefit eligibility and the beginning of benefit payments. Elimination periods may accompany an LTC benefit for several reasons, including limiting potential selection or moral hazard and wrapping LTC coverage around other programs that may pay benefits for a limited period of time. The user selects between the following elimination periods:

- 0 Days
- 90 Days
- 1 Year
- 2 Years
- 3 Years
- 4 Years

The elimination period can be used in combination with the benefit period in order to model front-end, catastrophic, or comprehensive coverage.

3.1.5 DAILY BENEFIT AMOUNT

The daily benefit amount defines the dollar amount of benefit that will be received per day after completion of the elimination period, so long as the beneficiary continues to satisfy the selected benefit trigger (e.g., 2 of 6 ADLs). This amount may be set to any value greater than $0.

3.1.6 BENEFIT PERIOD

The benefit period represents the length of time (in years) that an individual is eligible to receive benefits under a program. The daily benefit amount multiplied by the number of days in the benefit period is equal to the total value of the benefit pool (for instance, a $100 per day benefit for one year would equal a $36,500 total benefit). The individual is eligible to receive benefits under the program until the total value of the benefit pool is exhausted. The user is able to select from the following Benefit Periods:

- 1 Year
- 2 Years
- 3 Years
- 4 Years
- 5 Years
- Unlimited

The “Unlimited” selection models the impact of a 15-year benefit period. Because very few LTC episodes last longer than 15 years, the model uses the 15-year benefit period to estimate the impacts of catastrophic LTC benefits. Suppose a user would like to model impacts of catastrophic coverage with a two-year waiting period. In this case, an elimination period of 730 days (2 Years) would be selected with the Unlimited benefit period.

3.1.7 BENEFIT MAXIMUM

The benefit maximum is the maximum dollar amount of benefits that an individual can receive under the program. The benefit maximum is calculated as the product of benefit dollars and benefit period. While this value is not a direct user input, it is displayed in the input sheet for informational purposes.

3.1.8 CASH VS. SERVICE REIMBURSEMENT

The user defines whether benefits paid by the program are in the form of cash payments or reimbursement for formal services. Cash benefits would likely require less administrative expense by eliminating the need to verify service use and track what was spent on care. However, cash benefits are typically paid out in full for each day the

beneficiary meets the benefit trigger whereas beneficiaries may not utilize covered services as frequently. If services are not used each day of benefit eligibility or the value of services used is less than the daily benefit amount, reimbursement benefits will likely be less than cash benefits. This dynamic results in a lower projected tax rate necessary to fund a service reimbursement benefit than a cash benefit, all else being equal.

The model assumes that under a cash benefit, individuals will elect to receive the full benefit amount as soon as it is available. If the benefit is paid in cash, the model assumes the full amount of the benefit will be paid each day of benefit eligibility. However, for reimbursement benefits, the model assumes that the full amount of the benefit will not be paid each day due to differences in the value of the daily benefit and cost of care or care rationing.

3.1.9 HOME CARE BENEFIT UTILIZATION

For service reimbursement benefits in the community, the model assumes that the average cost of home care is $200 per day. This is in line with national Genworth cost of care statistics for 2023.[31] Genworth estimates the national median cost of home maker services as $189 and home health aide as $207 in 2023, assuming 44 hours per week of home care. For benefits less than $200 per day, the model assumes that the full benefit is used. If daily benefits are greater than $200 per day, the model assumes that $200 of benefit is used per day, and the remaining benefit is deferred until a later time.

3.1.10 FACILITY BENEFIT UTILIZATION

For service reimbursement in a facility, the model assumes that the average cost of facility care is $320 per day. This is the median cost of a private room according to the national Genworth cost of care statistics for 2023. The model assumes 100% utilization of daily benefits under this threshold.

3.2 FINANCING ASSUMPTIONS

The financing assumptions section allows the user to specify parameters that impact the model's estimate of the tax rate needed for program funding and beneficiary cost output. **Note, these parameters do not affect the estimated beneficiary impacts of the LTC benefit on 2018 episodes of disability.**

The cost of the modeled program is expressed as a payroll tax applied to either the Social Security payroll tax base (tax applies to earnings below the taxable maximum, $160,200 in 2023) or Medicare payroll tax base (payroll tax on all earnings). Based on the user input entered in this section as well as the Benefit Definition section, the LTC Population Research Model will produce an approximation of the payroll tax needed to finance the benefits, assuming the benefits are implemented nationwide. The user can define the following parameters that impact program financing:

- Vesting Requirement
- Tax Base
- Program Expenses as a Percent of Benefits
- Inflation Protection

While inflation protection is technically part of benefit definition, it is not considered in the application of the benefit to 2018 episodes. This benefit parameter has a large impact on the projected value of future benefits and is defined for purposes of estimating program financing requirements.

[31] Genworth. Cost of Long Term Care by State | Cost of Care Report. Genworth, 2023. https://www.genworth.com/aging-and-you/finances/cost-of-care.

3.2.1 VESTING REQUIREMENT

The vesting requirement denotes the requirements for an individual to be covered by the program. The model allows the user to choose one of two options:

- All individuals with an LTC need are eligible for benefits from program start.
- Individuals must complete a vesting requirement similar to the requirement for Social Security eligibility. This option would require ten years of payroll tax contributions, or tax contributions for three of the most recent six years.

Allowing all individuals to receive benefits immediately would maximize program coverage for the population but would require a larger payroll tax to finance the program. This method also does not tie program contributions to benefit payments as individuals who have retired when the program is implemented would be eligible to receive benefits although they have not made payroll tax contributions. This option is provided given that the Baby Boom generation is at or near retirement age.

The vesting requirement that is similar to Social Security would tie program contributions to benefit eligibility. This option reduces the cost of the program over the 75-year period and delays the start of program benefit payments as there is an initial period in which taxes are collected but benefits are not paid because individuals have not yet completed the vesting requirement.

The vesting criteria input is used in the estimate of the payroll tax necessary to fund the benefits. However, when beneficiary impacts are estimated, the model does not limit the eligible population based on assumed lifetime contribution to the program. Estimates of changes to expenditures are modeled on the entire disabled population, without adjustment for vesting criteria.

3.2.2 TAX BASE

The tax base option allows the user to choose the tax base to which the payroll tax is applied for funding. The user can select either the Social Security payroll tax base or the Medicare payroll tax base. The Social Security payroll tax base consists of all earnings up to a statutory maximum that is updated annually. In 2023, the maximum earnings subject to the payroll tax is $160,200. This means that any earnings above this amount are not taxed. The Medicare payroll tax base includes all earnings and does not have a statutory cap on earnings subject to the payroll tax. This amount is indexed through time consistent with the Social Security Trustees Report projections.

A program financed using the Social Security payroll tax base will result in a higher tax rate because the aggregate amount of earnings subject to the tax is less than the Medicare payroll tax base. This will result in a higher amount of tax paid for individuals with earnings below the statutory maximum compared to a Medicare payroll tax. However, a tax applied to the Social Security payroll tax base results in a more even distribution of contributions throughout the population whereas a Medicare payroll tax would result in a higher proportion of tax contributions coming from high wage earners.

3.2.3 PROGRAM EXPENSES

In addition to the cost of benefits, any program must pay the costs incurred for program administration. These costs include activities such as tax collection, eligibility determinations, claims adjudication, and benefit disbursements. The user sets the level of administrative expense as a percentage of benefit payments to be used by the model.

3.2.4 INFLATION PROTECTION

Inflation protection represents the annual increase in the value of benefits paid. Inflation protection is applied to both the daily benefit amount as well as the total benefit pool (daily benefit amount multiplied by benefit period, in days). The original total benefit pool is inflated to the date of disability. Due to annual increases in cost of care, inflation protection is included with many LTC benefits so that the value of the benefit is preserved over time.

However, higher values of inflation protection will increase benefit payments in future years and increase costs. Inflation protection is applied as compound inflation. The user is able to select the following levels of annual inflation protection:

- 0%
- 3%
- 5%

Note: The relationship between inflation protection and projected wage growth can have a large impact over the estimated tax rate needed.

3.2.5 INTEREST RATE AND WAGE GROWTH RATE

The user does not have the ability to adjust the interest and wage growth assumptions, but these assumptions are important factors in projecting potential costs over an extended period of time. Projections of interest rate and US average earnings are from the 2022 OASDI Trustees Report.[32] The Trustees Report provides three growth scenarios for wages eligible for the Social Security and Medicare payroll taxes. The model uses the baseline scenario to calculate funding requirements. This scenario assumes an ultimate annual interest rate of 4.7% and an ultimate annual wage growth rate of 3.5%. These assumptions are displayed on the User Input tab.

Estimates of the tax necessary to fund a program are highly sensitive to the relationship between benefit inflation protection and the wage growth assumption. Benefit inflation protection impacts the growth in benefits that are paid out over the 75-year period considered in this analysis, and wage growth impacts the growth in program income. In cases where benefit inflation is greater than anticipated wage growth (benefit payments are growing faster than income source), estimated program funding rates will be higher. In cases where benefit inflation is less than anticipated wage growth (benefit payments are growing slower than income source), estimated program funding rates will be lower.

[32] Social Security Administration. The 2022 OASDI Trustees report. *SSA*, 2022. https://www.ssa.gov/OACT/TR/2022/.

Section 4: Model Calculations

After a set of LTC benefit program parameters are defined on the User Input worksheet, the LTC Population Research Model provides an illustrative estimate of the tax rate necessary to fund the benefit and adjudicates the benefit for each record in the LTCE dataset. This process employs multiple simplifying assumptions to estimate potential high-level impacts of the selected benefits. This section discusses the methodology and assumptions used to provide the tax estimate and simulate record-level changes which are then aggregated to produce model output.

4.1 ESTIMATED TAX RATE

The model generates an illustrative estimate of the payroll tax necessary to fund the benefits specified by the user. These estimates inform the approximate level of cost necessary to fund the benefits based on selected benefit, financial, and economic parameters. Tax rate estimates are developed for the US population using a number of simplifying assumptions. The estimates generated by the model should be used for research purposes only and should not be relied upon to make decisions related to funding a program.

4.1.1 ASSUMPTIONS

The model generates payroll tax estimates using a 75-year projection of benefits administered to the US population from 2023-2098. This timeframe is consistent with projections of the Social Security Trust Fund and is sufficient to cover the projected lifetime of a new workforce entrant. A projection over this timeframe is highly uncertain, but it is important to develop an estimate to provide context to the benefits being modeled. This projection relies upon a number of assumptions, including:

- The US population projection is based on the 2022 OASDI Trustees Report. Fertility and mortality assumptions are consistent with the intermediate series of assumptions used to project the population.
- The model sources projected taxable (Social Security payroll tax base) and covered (Medicare payroll tax base) income from the 2022 OASDI Trustees Report.
- Wage growth and interest rate assumptions are consistent with the intermediate scenario outlined in the 2022 OASDI Trustees Report.
- Home and community incidence and continuance assumptions are based on the National Long-Term Care Survey,[33] adjusted to 2018 prevalence rates from the National Health Interview Survey.
- Nursing home incidence and continuance assumptions are derived from the National Nursing Home Survey, adjusted to 2016 Centers for Disease Control data.
- Vesting assumptions related to work history are derived from the 2006 Earnings Public Use Microdata File.[34] This data provides annual earnings information (i.e., a lifetime earnings profile) for a 1% random sample of all Social Security numbers issued before January 1, 2007.
- For service reimbursement benefits in the community, the model assumes that the average cost of home care is $200 per day. This is in line with national Genworth cost of care statistics for 2023.[35] Genworth estimates the national median cost of home maker services as $189 and home health aide as $207 in 2023,

[33] Manton, Kenneth G. National Long-Term Care Survey: 1982, 1984, 1989, 1994, 1999, and 2004. *Inter-university Consortium for Political and Social Research*, Jun. 21, 2010, https://doi.org/10.3886/ICPSR09681.v5.
[34] Social Security Administration. Earnings Public-Use File, 2006. *SSA*, Aug. 2011, https://www.ssa.gov/policy/docs/microdata/epuf/index.html.
[35] Genworth. Cost of Long Term Care by State | Cost of Care Report. *Genworth*, 2023. https://www.genworth.com/aging-and-you/finances/cost-of-care.

assuming 44 hours a week of home care. For benefits less than $200 per day, we assume that the full benefit is used. If daily benefits are greater than $200 per day, we assume that $200 of benefit is used per day, and the remaining benefit is deferred until a later time.

It is important to consider that over a 75-year period, the estimated tax rate for funding is highly sensitive to the relationship between wage growth, interest rates, and benefit inflation. Cases in which annual benefit increases exceed annual wage growth and interest will result in large projected costs.

4.1.2 CALCULATION

The payroll tax necessary to fund given benefits is estimated by calculating the present value of benefit payments and expenses over the 75-year period. This amount is divided by the present value of the applicable tax base to generate an estimate of the annual tax rate necessary to fund the benefits.

The vested population in each year is determined based on the population projection and the vesting requirement selected by the user. This population will either be all individuals or those who have met the work requirement of ten years of tax contributions or contributions in three of the most recent six years before benefit eligibility.

Benefit payments are calculated by applying incidence and continuance rates, by age and sex, to the vested population for each year. These calculations estimate the number of eligible beneficiaries in each year and the average length of time that benefits will be paid. The benefit is then adjudicated to the eligible population, accounting for all user-specified benefit parameters (elimination period, daily benefit amount, benefit maximum, assumed benefit utilization, etc.). Non-benefit expenses are estimated as a percent of benefit payments.

The present value of benefits, expenditures and the payroll tax base in each year is calculated using the interest rate selected by the user. Estimated tax rates are calculated using the present values, and rates are rounded up to the nearest 0.05%.

4.2 LTC EXPENDITURE IMPACTS

The model estimates beneficiary impacts of benefits at the LTC episode level. The benefits are applied to each episode record in the LTCE dataset to estimate impacts of current LTC expenditures and potential impacts on informal care. A number of assumptions are made to estimate the impact of benefits on an LTC episode. The major assumptions relate to coordination of benefits and the calculation of net benefits (individual benefits net of individual program contributions).

4.2.1 EXPENDITURE AND WAGE TRENDS

Reported expenditures from the survey data are trended from 2018 to 2024 dollars using Genworth cost of care statistics.[36] Community expenditure trend was assumed to be 5% per year, and facility trend was assumed to be 3% per year. Income and net worth are trended from 2018 to 2024 dollars using data from the Federal Reserve Bank of Atlanta.[37] The wage growth tracker is a measure of nominal wage growth. The average annual growth was 4.6% from the period 2018 to 2024. This growth rate was applied to all income and net worth measures in order to trend the dollar amounts but preserve the relationships present in the 2018 data.

The model did not explicitly account for changes in LTC utilization resulting from the COVID-19 pandemic. Utilization patterns are assumed to remain consistent with the data observed in 2018.

[36] Genworth Cost of Care Survey: Median Cost Data Tables. *Genworth*, 2022, https://pro.genworth.com/riiproweb/productinfo/pdf/282102.pdf.
[37] Wage Growth Tracker. (n.d.). *Federal Reserve Bank of Atlanta*. https://www.atlantafed.org/chcs/wage-growth-tracker.

4.2.2 BENEFIT PAYMENTS

The benefit payments to each individual are calculated based on length of episode and the benefit parameters selected by the user. The total benefit received accounts for the elimination period, daily benefit amount, benefit maximum, and cash or service reimbursement mechanism. Generally, the calculation can be described by the following formula:

$$Benefit\ Payment = Min[Max(LOE - EP, 0) * DBA * Benefit\ Utilization, DBA * Benefit\ Period]$$

For example, assuming the following benefit parameters:

- Care Setting: Community
- Elimination Period: 90 Calendar Days
- Daily Benefit Amount: $100
- Benefit Period: 1 Year
- Benefit Utilization = Min[$200/$100, 100%] = 100%

Note, inflation protection is not considered in the calculation because the benefit is being applied to episodes active in 2018. An individual with a length of stay of 200 days would receive a benefit payment of:

$$\$11{,}000 = Min[(200 - 90) * \$100 * 100\%, \$100 * 365]$$

4.2.3 COORDINATION OF BENEFITS

The sources of LTC expenditures for each episode record are:

- Medicare
- Medicaid
- Private
- OOP
- Other

When estimating how a benefit payment will interact with existing sources of LTC expenditures, the model assumes that the benefit pays secondary to all sources other than Medicaid and OOP. This means that Medicare, Private, and Other (VA, TRICARE, and other programs) expenditures will be unchanged in all cases. These benefits are earned either through work history or premium payments, and these programs are assumed to continue to pay for care in the same capacity as before the implementation of a new, public benefit.

The model assumes Medicaid expenditures to be the first expenditures offset by the public benefit. Medicaid is a social safety net that is a payor of last resort by federal law. It is not uncommon for those who utilize formal LTC services to exhaust their resources and become eligible for Medicaid during their episode of care. If an individual is eligible for a public benefit, the model assumes that the full amount of the benefit offsets current Medicaid spending. This is a simplifying assumption in that Medicaid eligibility and cost sharing requirements vary by state, and there could be instances where Medicaid expenditures would not be completely offset by another payment source.

When tabulating reductions in individual Medicaid expenditures, it is important to consider that Medicaid funding is shared by state and federal governments. Thus, any reductions in Medicaid spending would accrue in part to state and federal governments based on the applicable federal matching percentage in each state.

When reducing Medicaid expenditures, the model considers differences in Medicaid reimbursement for services compared to private pay. The model assumes that, on average, Medicaid pays 80% of private pay for the same

services.[38] This assumption is based on research conducted by the Kaiser Family Foundation,[39] the Medicaid and CHIP Payment Access Commission,[40] and the National Investment Center.[41] This assumption impacts the estimate of the benefit necessary to cover services currently being funded by Medicaid. For instance, assuming Medicaid pays 80% of private rates implies that $1.25 of program reimbursement is required to reduce Medicaid expenditures by $1.

The model applies any benefit that remains after Medicaid expenditures have been reduced to OOP expenditure reductions. If there is benefit remaining after current Medicaid and OOP expenditures have been fully funded, the model classifies this amount as additional benefit. The additional benefit amount is added to current total, reported expenditures to generate an estimate of total expenditures under a program.

[38] Kaiser reports the median Medicaid hourly payment for personal care providers was $18.66 in 2023 while Genworth reports median hourly costs of $30 per hour for homemaker services ($18.66/$30=62%). Median Medicaid hourly payment for Home Health Aides was $28.46 in 2023 while Genworth reports median hourly costs of $33 per hour for home health aides ($28.46/$33=86%). Based on these numbers, we have assumed Medicaid reimbursement for community services is 75%. Various sources indicate that Medicaid reimburses between 70% and 80% of private pay rates for facility care. We have assumed 80%.

[39] Burns, A., Mohamed, M., & Watts, M. O. (2023, October 24). Payment Rates for Medicaid Home- and Community-Based Services: States' Responses to Workforce Challenges. *KFF*, Oct. 24, 2023, https://www.kff.org/medicaid/issue-brief/payment-rates-for-medicaid-home-and-community-based-services-states-responses-to-workforce-challenges/.

[40] MACPAC. Estimates of Medicaid Nursing Facility Payments Relative to Costs. *MACPAC*, Jan. 2023. https://www.macpac.gov/wp-content/uploads/2023/01/Estimates-of-Medicaid-Nursing-Facility-Payments-Relative-to-Costs-1-6-23.pdf.

[41] Le, M. Medicaid Reimbursement Rates Draw Attention. *National Investment Center*, Mar. 21, 2018. https://www.nic.org/medicaid-reimbursement-rates-draw-attention/.

Section 5: Model Output

The model aggregates the record-level impacts and provides summary output to describe potential program impacts. This section discusses the output provided by the model along with caveats and limitations.

5.1 TABLE 1 – ELIGIBLE POPULATION

The "Table 1 - Eligible Population" worksheet displays portions of the 2018 population expected to (1) meet the benefit trigger for the modeled benefits and (2) the population expected to both meet the benefit trigger and have an episode that lasts longer than the elimination period, by age group. This tab applies the benefit trigger and elimination period to each person-level record present in 2018 to see if an individual would qualify for the benefit and meet the elimination period.

Table 1: Population Eligible for Program Benefit

ADL Trigger	2+
Cognitive Trigger	Yes

		Population Meeting Benefit Trigger		Benefit Trigger and Episode Exceeds EP	
Age Group	US Population	N	%	N	%
All Ages	253,000,000	5,979,500	2.4%	5,640,000	2.2%
18-34	74,000,000	424,500	0.6%	387,500	0.5%
35-44	41,000,000	298,500	0.7%	278,500	0.7%
45-54	41,000,000	375,000	0.9%	359,000	0.9%
55-64	42,000,000	739,000	1.8%	689,500	1.6%
65-74	32,000,000	709,000	2.2%	704,000	2.2%
75-84	16,000,000	1,285,000	8.0%	1,189,500	7.4%
85+	7,000,000	2,149,000	30.7%	2,032,500	29.0%

Note: This table displays tabulations based one the following program parameters-

Benefit Eligibility: Community Residents with 2+ ADLs or severe cognitive impairment and all facility residents.

Elimination Period: 90 Days | Daily Benefit Amount: $125 | Benefit Period: 1 Year

This program is assumed to be funded through a 1.00% payroll tax applied to the Social Security tax base.

Impacts are modeled on the entire disabled population reported in 2018 survey data. No considerations are made for vesting criteria.

In defining episode expenditures, community and facility episodes are considered separately.

Net worth values exclude primary residence.

Values may not add to totals due to rounding.

5.2 TABLE 2 – CARE SETTING

The "Table 2 - Care Setting" worksheet displays the 2018 population who meets the benefit trigger for the modeled benefits, by care setting. Care setting is defined for all combinations of informal and formal care in the community as well as facility care. In addition, this sheet displays the average LTC expenditure for each group in 2024 dollars as well as the average total benefit received by each modeled group. This output is intended to illustrate the average value of benefits for various groups of those with an LTC need.

Table 2: Population Eligible for Program Benefit, by Care Setting (2024 Dollars)

ADL Trigger	2+
Cognitive Trigger	Yes

Care Setting	Population Meeting Benefit Trigger	% of Population Meeting Benefit Trigger	Average LTC Expenditure (2024 Dollars)	Average Program Benefit	Program Benefit as Percentage of Expenditure
Community					
No Formal or Informal Care	505,500	8%	$ -	$ 37,500	NA
Informal Care Only	1,203,000	20%	$ -	$ 37,000	NA
Formal and Informal Care	1,532,500	26%	$ 74,500	$ 39,500	53%
Formal Care Only	630,500	11%	$ 90,500	$ 33,500	37%
Facility	2,107,500	35%	$ 236,500	$ 36,500	15%
Total	5,979,000	100%	$ 112,000	$ 37,100	33%

Note: This table displays tabulations based one the following program parameters-

Benefit Eligibility: Community Residents with 2+ ADLs or severe cognitive impairment and all facility residents.

Elimination Period: 90 Days | Daily Benefit Amount: $125 | Benefit Period: 1 Year

This program is assumed to be funded through a 1.00% payroll tax applied to the Social Security tax base.

Impacts are modeled on the entire disabled population reported in 2018 survey data. No considerations are made for vesting criteria.

In defining episode expenditures, community and facility episodes are considered separately.

Net worth values exclude primary residence.

Values may not add to totals due to rounding.

5.3 TABLE 3 – BENEFICIARY COST

The "Table 3 Beneficiary Cost" worksheet displays annual tax contributions made by the families of each eligible beneficiary in 2018. The tax contribution is displayed in both annual and monthly terms. Family income is used to calculate cost metrics because family members are typically involved in providing care for those with an LTC need.

Table 3: Beneficiary Contributions to the Program (2024 Dollars)

Tax Base	Social Security Payroll
Tax Rate	1.00%

Family Income Group	Population	% of Population Meeting Benefit Trigger	Annual Tax Contribution (2024 Dollars)	Monthly Premium Equivalent
All Family Incomes	252,569,537	100%	$ 855	$71
<$10,000	14,331,895	6%	$ 35	$3
$10,000-24,999	30,398,745	12%	$ 176	$15
$25,000-49,999	50,323,121	20%	$ 368	$31
$50,000-74,999	44,025,619	17%	$ 615	$51
$75,000-124,999	56,540,828	22%	$ 975	$81
$125,000+	56,949,329	23%	$ 1,921	$160

Note: This table displays tabulations based one the following program parameters-

Benefit Eligibility: Community Residents with 2+ ADLs or severe cognitive impairment and all facility residents.

Elimination Period: 90 Days | Daily Benefit Amount: $125 | Benefit Period: 1 Year

This program is assumed to be funded through a 1.00% payroll tax applied to the Social Security tax base.

Impacts are modeled on the entire disabled population reported in 2018 survey data. No considerations are made for vesting criteria.

In defining episode expenditures, community and facility episodes are considered separately.

Net worth values exclude primary residence.

Values may not add to totals due to rounding.

5.4 TABLE 4 – CURRENT EXPENDITURES

The "Table 4 - Current Expenditures" worksheet displays estimates of the average LTC episode expenditures by channel of payment for various population cohorts. This table reflects all community and facility episodes that reported non-zero LTC expenditures in 2018, and episodes that did not report LTC expenditures are not included. All dollar amounts are trended to 2024 dollars. Impacts are displayed for various cross-sections of the population including, age group, sex, region, family income group, net worth group, informal care status, care setting, Medicaid status, and private LTCI coverage status. The user can open and close the "grouped" cells using the "+" button at the top of column Q to display the expenditure distribution for each subgroup.

Table 4: Estimated LTC Episode Expenditures, by Channel of Payment (2024 Dollars)

Episodes of Disability Active in 2018 with Reported LTC Expenditures

			Average Episode Expenditure (2024 Dollars)					
	Eligible Population	% Eligible Population	Total	Medicare	Medicaid	Private	OOP	Other
All Ages	4,206,500	100%	159,000	10,000	79,500	9,500	53,000	7,000
18-34	156,500	4%	99,000	500	91,500	2,500	3,000	1,500
35-44	107,000	3%	105,500	3,000	80,000	-	8,000	14,500
45-54	157,500	4%	141,000	22,500	88,500	3,000	19,500	7,500
55-64	426,500	10%	201,000	9,000	125,500	16,500	34,000	16,000
65-74	566,500	13%	148,500	10,500	103,000	5,000	24,000	6,000
75-84	967,000	23%	159,500	10,000	86,500	6,500	48,500	8,000
85+	1,826,000	43%	163,000	11,000	55,500	13,000	78,500	5,000

5.5 TABLE 5 – PROJ EXPENDITURES

The "Table 5 - Proj Expenditures" worksheet displays estimates of the average LTC episode expenditures by channel of payment for various population cohorts assuming the modeled program benefit is in place. This table reflects all community and facility episodes that reported non-zero LTC expenditures in 2018, and episodes that did not report LTC expenditures are not included. All dollar amounts are trended to 2024 dollars. Impacts are displayed for various cross-sections of the population including, age group, sex, region, family income group, net worth group, informal care status, care setting, Medicaid status, and private LTCI coverage status.

The program benefit that is paid for each episode is assumed to offset Medicaid expenditures first and then OOP expenditures. Any remaining program benefit is assumed to be spent in excess of current expenditures. The model does not make any assumption as to how this benefit will be used. Table 5 displays the updated expenditure by original channel of payment, the estimated reduction in expenditure for the original channels of payment and the remaining benefit.

The user can open and close the "grouped" cells using the "+" button at the top of column S to display the expenditure distribution for each subgroup.

Table 5: Estimated LTC Episode Expenditures with Program Benefit, by Channel of Payment (2024 Dollars)
Episodes of Disability Active in 2018 with Reported LTC Expenditures

			Average Episode Expenditure (2024 Dollars)						
	Eligible Population	% Eligible Population	Total	Medicare	Medicaid	Private	OOP	Other	Program Benefit
All Ages	4,206,500	100%	173,000	10,000	66,000	9,500	43,500	7,000	37,000
18-34	156,500	4%	109,500	500	68,500	2,500	2,000	1,500	34,500
35-44	107,000	3%	123,500	3,000	58,000	-	5,500	14,500	42,500
45-54	157,500	4%	164,000	22,500	70,500	3,000	16,000	7,500	44,500
55-64	426,500	10%	216,000	9,000	104,500	16,500	32,000	16,000	38,000
65-74	566,500	13%	169,000	10,500	88,500	5,000	21,500	6,000	37,500
75-84	967,000	23%	171,500	10,000	74,000	6,500	39,000	8,000	34,000
85+	1,826,000	43%	176,500	11,000	46,000	13,000	63,500	5,000	38,000

5.6 TABLE 6 – EXPENDITURE CHANGE

The "Table 6 – Expenditure Change" worksheet displays estimates of the average change in LTC episode expenditures by channel of payment for various population cohorts assuming the modeled benefits are in place. This table reflects all community and facility episodes that reported non-zero LTC expenditures in 2018, and episodes that did not report LTC expenditures are not included. All dollar amounts are trended to 2024 dollars. Impacts are displayed for various cross-sections of the population including, age group, sex, region, family income group, net worth group, informal care status, care setting, Medicaid status, and private LTCI coverage status.

This sheet displays estimates of the average total benefit paid, broken out by the portion attributed to Medicaid reductions, difference in reimbursement between Medicaid and private pay, OOP reductions, and remaining benefit. The user can open and close the "grouped" cells using the "+" button at the top of column R to display the distribution of benefit components for each subgroup.

Table 6: Changes to Estimated LTC Episode Expenditures with Program Benefit, by Channel of Payment (2024 Dollars)
Episodes of Disability Active in 2018 with Reported LTC Expenditures

						Program Benefit				
	Eligible Population	% Eligible Population	Current Total Expenditures	Projected Total Expenditures	Change in LTC Expenditure	Total Benefit	Medicaid Reduction	Difference in Medicaid and Private Pay	OOP Reduction	Remaining Benefit
All Ages 18+	4,206,500	100%	159,000	173,000	14,000	37,000	13,500	3,000	9,500	11,000
18-34	156,500	4%	99,000	109,500	10,500	34,500	23,000	6,000	1,000	4,500
35-44	107,000	3%	105,500	123,500	18,000	42,500	22,000	6,000	2,500	12,000
45-54	157,500	4%	141,000	164,000	23,000	44,500	18,000	5,000	3,500	18,000
55-64	426,500	10%	201,000	216,000	15,000	38,000	21,000	5,000	2,000	10,000
65-74	566,500	13%	148,500	169,000	20,500	37,500	14,500	4,000	2,500	16,500
75-84	967,000	23%	159,500	171,500	12,000	34,000	12,500	3,000	9,500	9,000
85+	1,826,000	43%	163,000	176,500	13,500	38,000	9,500	2,000	15,000	11,500

5.7 TABLE 7 – BENEFIT COVERAGE

The "Table 7 – Benefit Coverage" worksheet displays the average LTC episode expenditure and average benefit received under the modeled benefits, by length of episode. This table reflects all community and facility episodes that reported non-zero LTC expenditures in 2018, and episodes that did not report LTC expenditures are not included. All dollar amounts are trended to 2024 dollars.

This sheet is intended to illustrate the value of the benefit compared to historical LTC episode expenditures. Length of episode is directly related to an individual's LTC expenditure, and episode length varies greatly among those with a care need. The data is displayed by length of episode to provide context to the relative impacts of the modeled benefits on various cohorts of individuals.

Table 7: Percentage of LTSS Expenditure Covered by Benefit, by Length of Episode (2024 Dollars)
Episodes of Disability Active in 2018 with Reported LTC Expenditures

Length of Episode	Population Meeting Benefit Trigger	% Meeting Benefit Trigger	Average Reported LTC Expenditure	Avgerage Program Benefit	Program Benefit as Percentage of Expenditure
All LOE	4,206,500	100%	159,000	37,000	23%
<1 Year	1,050,500	25%	36,000	13,000	36%
1-2 Years	1,232,500	29%	97,000	44,500	46%
2-3 Years	403,500	10%	136,500	45,500	33%
3-4 Years	438,000	10%	197,500	45,500	23%
4-5 Years	271,000	6%	240,500	45,500	19%
5+ Years	811,000	19%	377,500	45,500	12%

Note: This table displays tabulations based one the following program parameters-

Benefit Eligibility: Community Residents with 2+ ADLs or severe cognitive impairment and all facility residents.

Elimination Period: 90 Days | Daily Benefit Amount: $125 | Benefit Period: 1 Year

This program is assumed to be funded through a 1.00% payroll tax applied to the Social Security tax base.

This table displays values for individuals reporting a non-zero LTC expenditure in 2018. Those not reporting expenditures are excluded.

Impacts are modeled on the entire disabled population reported in 2018 survey data. No considerations are made for vesting criteria.

In defining episode expenditures, community and facility episodes are considered separately.

Values may not add to totals due to rounding.

5.8 TABLE 8 – COVERAGE COMMUNITY

The "Table 8 – Coverage Community" worksheet displays the average LTC episode expenditure and average benefit received under the program *for community episodes only*, by length of episode. This table reflects all community

and facility episodes that reported non-zero LTC expenditures in 2018, and episodes that did not report LTC expenditures are not included. All dollar amounts are trended to 2024 dollars.

This table is a subset of Table 7 that excludes facility records in order to isolate the program impact on the community population. The cost of care is much higher in facility settings, so it is useful to examine the impact of a given benefit by care setting.

5.9 TABLE 9 – COVERAGE FACILITY

The "Table 9 – Coverage Facility" worksheet displays the average LTC episode expenditure and average benefit received under the program *for facility episodes only*, by length of episode. This table reflects all community and facility episodes that reported non-zero LTC expenditures in 2018, and episodes that did not report LTC expenditures are not included. All dollar amounts are trended to 2024 dollars.

This table is a subset of Table 7 that excludes community records in order to isolate the impact on the facility population. The cost of care is much higher in facility settings, so it is useful to examine the impact of a given benefit by care setting.

5.10 TABLE 10 – OOP IMPACTS

The "Table 10 – OOP Impacts" worksheet examines the potential impact of modeled benefits on current OOP spending on LTC services. This table reflects all community and facility episodes that reported non-zero LTC expenditures in 2018, and episodes that did not report LTC expenditures are not included. All dollar amounts are trended to 2024 dollars. Impacts are displayed for various cross-sections of the population including, age group, sex, region, family income group, net worth group, informal care status, care setting, Medicaid status, and private LTCI coverage status.

Episode OOP savings are defined as the estimated reduction in current episode OOP spending. This amount is compared to family income and household net worth, excluding primary residence, by group, in order to quantify the potential impact on household finances.

Table 10: Impacts to Out-of-Pocket Expenditures for Individuals (2024 Dollars)
Episodes of Disability Active in 2018 with Reported LTC Expenditures

	Eligible Population	% Eligible Population	Reduction in Episode OOP Expenditure	Average Family Income	Household Net Worth (Excl. Residence)	OOP Reduction as % of Income	OOP Reduction as % of Net Worth
All Ages	4,206,500	100%	9,500	45,500	272,000	21%	3%
18-34	156,500	4%	1,000	86,000	85,500	1%	1%
35-44	107,000	3%	2,500	42,000	25,000	6%	10%
45-54	157,500	4%	3,500	33,000	192,000	11%	2%
55-64	426,500	10%	2,000	39,500	264,500	5%	1%
65-74	566,500	13%	3,000	38,000	184,500	8%	2%
75-84	967,000	23%	9,500	49,500	296,500	19%	3%
85+	1,826,000	43%	15,000	44,500	325,500	34%	5%

5.11 TABLE 11 – INFORMAL CARE

The "Table 11 – Informal Care" worksheet examines the potential impact of benefits on current informal care. Because the model assumes that informal care is only provided in the community, this table reflects data for the eligible community population, including those with and without reported LTC expenditures. Informal care information is displayed for various cross-sections of the population including age group, sex, region, family income group, asset group, informal care status, care setting, Medicaid status, and private LTCI coverage status.

The table identifies the proportion of eligibles in each population group who reported informal care utilization in 2018. Additionally, the amount of benefit remaining after offsets to current expenditures is reported for each

subgroup. This amount represents the benefit that an individual is expected to receive after reductions in current Medicaid and OOP spending. This benefit could potentially be used to offset informal care and provide additional support to informal caregivers.

The benefit in excess of current expenditures is also represented as a number of days of formal care that could be provided under the program, assuming that one day of formal community care is defined as four hours per day at a rate of $25 per hour.

Table 11: Potential Impacts to Informal Caregiving (2024 Dollars)
Episodes of Disability Active in 2018

	Community Population		Reported Informal Care		Informal Care Only				Informal and Formal Care			
	N	%	N	%	N	%	Average Benefit Over Current Exp	Days of Formal Care from Benefit	N	%	Average Benefit Over Current Exp	Days of Formal Care from Benefit
All Ages	3,872,000	100%	2,736,000	100%	1,203,000	100%	37,000	370	1,532,500	100%	21,500	220
18-34	412,000	11%	308,000	11%	176,000	15%	33,500	340	132,500	9%	3,500	40
35-44	277,000	7%	214,500	8%	154,000	13%	37,000	370	60,500	4%	16,500	170
45-54	319,000	8%	228,000	8%	148,500	12%	35,000	350	79,500	5%	26,000	260
55-64	607,500	16%	433,000	16%	230,500	19%	38,500	390	202,500	13%	16,000	160
65-74	451,500	12%	303,500	11%	115,000	10%	42,000	420	189,000	12%	24,500	250
75-84	735,500	19%	435,000	16%	181,000	15%	39,500	400	254,000	17%	22,500	230
85+	1,069,500	28%	813,500	30%	198,500	17%	33,500	340	615,000	40%	26,500	270

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Appendix A: LTC Episode Data Summary

This section provides selected summary statistics for the LTCE dataset. The data represents a point-in-time estimate of individuals experiencing an LTC episode in 2018.

A.1 POPULATION COUNTS

Table A.1.1
DISTRIBUTION OF AGE BY CARE SETTING

Age Group	All Care Settings		Community		Facility	
Age 18-64	2,118,405	(31%)	1,896,829	(41%)	221,576	(11%)
Age 65+	4,661,946	(69%)	2,774,143	(59%)	1,887,804	(89%)
Total	6,780,351	(100%)	4,670,971	(100%)	2,109,380	(100%)

Table A.1.2
ADL/CI DISABILITY BY CARE SETTING

ADL Group	All Care Settings		Community		Facility	
1 ADL	915,794	(14%)	879,748	(19%)	36,046	(2%)
2 ADL	1,078,068	(16%)	1,059,580	(23%)	18,488	(1%)
3+ ADL	3,450,517	(51%)	2,156,731	(46%)	1,293,786	(61%)
CI-Only	1,335,972	(20%)	574,912	(12%)	761,060	(36%)
Total	6,780,351	(100%)	4,670,971	(100%)	2,109,380	(100%)

Table A.1.3
MEDICAID ELIGIBILITY BY CARE SETTING

Medicaid Eligible	All Care Settings		Community		Facility	
Yes	3,376,032	(50%)	2,416,655	(52%)	959,377	(45%)
No	3,404,319	(50%)	2,254,317	(48%)	1,150,002	(55%)
Total	6,780,351	(100%)	4,670,971	(100%)	2,109,380	(100%)

Table A.1.4
PRESENCE OF PRIVATE LTCI BY CARE SETTING

Private LTCI	All Care Settings		Community		Facility	
Yes	443,441	(7%)	325,206	(7%)	118,235	(6%)
No	6,336,911	(93%)	4,345,766	(93%)	1,991,145	(94%)
Total	6,780,351	(100%)	4,670,971	(100%)	2,109,380	(100%)

Table A.1.5
FORMAL AND INFORMAL CARE UTILIZATION BY CARE SETTING

Formal/Informal Care Status	All Care Settings		Community		Facility	
No Formal or Informal Care	744,756	(11%)	680,673	(15%)	64,082	(3%)
Informal Care Only	1,469,791	(22%)	1,469,791	(31%)	0,000	(0%)
Both Formal and Informal Care	1,834,035	(27%)	1,834,035	(39%)	0,000	(0%)
Formal Care Only	2,731,769	(40%)	686,472	(15%)	2,045,297	(97%)
Total	6,780,351	(100%)	4,670,971	(100%)	2,109,380	(100%)

A.2 INCOME AND NET WORTH

Table A.2.1
DISTRIBUTION OF FAMILY INCOME

Family Income	Population
0-24,999	49%
25,000-49,999	23%
50,000-74,999	12%
75,000-99,999	7%
100,000-124,999	4%
125,000-149,999	2%
150,000-174,999	2%
175,000-200,000	<1%
>200,000	2%
Total	100%

Table A.2.2
DISTRIBUTION OF HOUSEHOLD, NON-HOUSING NET WORTH

Household, Non-Housing Net Worth	Population
<0	10%
0-199,999	69%
200,000-399,999	8%
400,000-599,999	4%
600,000-799,999	2%
800,000-1,000,000	2%
>1,000,000	6%
Total	100%

A.3 LENGTH OF EPISODE

Table A.3.1
DISTRIBUTION OF LENGTH OF EPISODE BY CARE SETTING

Care Setting	<1 Year	1-2 Years	2-3 Years	3-4 Years	4-5 Years	5+ Years
Community	24%	20%	14%	10%	8%	25%
Facility	27%	20%	17%	11%	6%	19%
Total	25%	20%	15%	10%	7%	23%

A.4 LTC EXPENDITURES

Table A.4.1
LTC EXPENDITURE BY CHANNEL OF PAYMENT, 2018 (BILLIONS OF DOLLARS)

Care Setting	Total	Medicaid	Medicare	Private	OOP	Other
Community	87.5	36.4	31.5	7.2	8.3	4.1
Facility	96.6	41.0	0.6	6.9	44.0	4.1
Total	184.1	77.4	32.2	14.1	52.3	8.2

Table A.4.2
LTC EXPENDITURE BY CHANNEL OF PAYMENT 2018, ALL FACILITY AND COMMUNITY, 2+ ALDS/CI (BILLIONS OF DOLLARS)

Care Setting	Total	Medicaid	Medicare	Private	OOP	Other

Community	45.0	23.9	10.2	3.4	6.3	1.2
Facility	96.6	41.0	0.6	6.9	44.0	4.1
Total	141.6	64.9	10.8	10.3	50.3	5.3

Appendix B: Data Element Specifications

This section identifies the source of each data element used to develop the LTC Episodes dataset. It also outlines caveats and limitations applicable to the data.

This section identifies the data items used from each source dataset and discusses caveats and limitations.

B.1 COMMUNITY

B.1.1 PRIMARY DATA SOURCE

The MEPS-HC is used as the primary data source for the community population, ages 18 to 64. The MEPS-HC is administered to the civilian, noninstitutionalized population and contains detailed demographic and expenditure data.

Age Group

Survey File	MEPS-HC Full Year Consolidated File (2018)
Element	AGE18X
Definition	Age as of 12/31/2018
Considerations	The AGE18X field identifies the age of the survey respondent at the end of the survey period.

Sex

Survey File	MEPS-HC Full Year Consolidated File (2018)
Element	SEX
Definition	Sex
Considerations	The SEX field identifies the sex of the survey respondent at the time the survey was administered.

Region

Survey File	MEPS-HC Full Year Consolidated File (2018)
Element	REGION
Definition	Census region as of 12/31/19
Considerations	The REGION field identifies the region in which the survey respondent resides at the time the survey is administered. Regions: • Northeast • Midwest • South • West

Income

Survey File	MEPS-HC Full Year Consolidated File (2018)
Element	ERNYR_I2
Definition	Individual total earnings in last year
Considerations	Individual earnings were used instead of family earnings because there are instances of families with high earnings where one individual within the family qualifies for Medicaid (likely due to complex eligibility rules).

ADL Disability

Survey File	MEPS-HC Full Year Consolidated File (2018)
Element	ADLHLP31
Definition	ADL Screener

Considerations	The MEPS-HC respondents indicate whether individual ADL assistance is needed by responding to the question: *Does anyone in this household receive help or supervision with personal care such as bathing, dressing, or getting around the house because of an impairment or a physical or mental health problem?* This information can be used to identify individuals who actively receive help for ADL and cognitive limitations, but it does not indicate the severity of disability.

Home Health Expenditures by Channel of Payment

Survey File	MEPS-HC Full Year Consolidated File (2018)
Element	• HHAEXP18 – Agency Total • HHAMCD18 – Agency Medicaid • HHAMCR18 – Agency Medicare • HHAOFD18 – Agency Other Federal Sources • HHAOSR18 – Agency Other Unclassified • HHAPRV18 – Agency Private • HHASLF18 – Agency Out-of-Pocket • HHASTL18 – Agency Other State/Local Sources • HHATRI18 – Agency TRICARE • HHAVA18 – Agency VA • HHAWCP18 – Agency Workers Comp • HHNEXP18 – Non-Agency Total • HHNMCD18 – Non-Agency Medicaid • HHNMCR18 – Non-Agency Medicare • HHNOFD18 – Non-Agency Other Federal Sources • HHNOSR18 – Non-Agency Other Unclassified • HHNPRV18 – Non-Agency Private • HHNSLF18 – Non-Agency Out-of-Pocket • HHNSTL18 – Non-Agency Other State/Local Sources • HHNTRI18 – Non-Agency TRICARE • HHNVA18 – Non-Agency VA • HHNWCP18 – Non-Agency Workers Comp
Definition	Home Health Expenditures by Channel of Payment
Considerations	The MEPS-HC reports home health expenditures for home health services provided by agencies and non-agencies. MESP expenditures are defined as the sum of direct payments for care provided during the year, including OOP payments and payments by private insurance, Medicaid, Medicare, and other sources.

Medicaid Coverage

Survey File	MEPS-HC
Element	MEDICAID
Definition	Medicaid coverage recode
Considerations	The MEPS-HC asks multiple questions about Medicaid eligibility. The responses to these questions are analyzed to determine whether a respondent was covered by Medicaid within the past twelve months.

B.1.2 IMPUTED INFORMATION

Net Worth

Survey File	SIPP
Element	• THNETWORTH – Household-level net worth • TNETWORTH – Person-level net worth • THEQ_HOME – Household-level sum of equity in primary residence • TEQ_HOME – Person-level sum of equity in primary residence
Definition	Household and Person-Level Net Worth
Considerations	The Survey of Income and Program Participation (SIPP) was chosen as the source of asset information to be imputed onto the NHIS records. The SIPP was chosen because it contains detailed information on assets for the same population as the MEPS-HC and has common demographic and Medicaid eligibility information. The SIPP survey provides values of household and individual net worth as well as household and person-level values of home equity. By subtracting home equity from net worth, estimated values for non-housing net worth were obtained.

ADL Disability

Survey File	PERSONX
Element	• LABATH • LADRESS • LAEAT • LABED • LATOILT • LAHOME
Definition	Does respondent need help with task?
Considerations	These fields identify whether the respondent requires help with five of the six HIPAA ADLs: • Bathing (LABATH) • Dressing (LADRESS) • Eating (LAEAT) • Toileting (LATOILT) • Transferring (LABED and LAHOME) Transferring is reported both in terms of getting in and out of bed or chairs as well as help getting around in the home.

Cognitive Impairment

Survey File	PERSONX
Element	LAHCA16
Definition	Senility causes limitation
Considerations	The NHIS collects data on multiple causes of cognitive disability. These include:[42] • Intellectual disability • Developmental disability • Dementia or Alzheimer's disease • Learning disability or ADHD • Mental illness (depression, anxiety, PTSD, emotional problems) • Traumatic brain injury or stroke • Age-related changes Senility includes dementia and Alzheimer's as the cause of cognitive limitation. This is consistent with the HIPAA definition of severe cognitive impairment.

Private LTCI

Survey File	HRS
Element	• RXHILTC • RXLTCPRM
Definition	Presence of Long-Term Care Insurance
Considerations	The HRS was chosen as the source of private LTC insurance coverage because tabulations of private insurance coverage reported in the NHIS appears to be underreported. The RXHILTC variable indicates the presence of a private insurance plan that covers LTC expenditures. The RXLTCPRM variable indicates the monthly premium for private LTCI denoted in the field RXHITLC. In some cases, respondents indicate that there is no premium because the LTCI coverage is provided by another private medical plan. Because medical plans do not typically cover LTC services, it is assumed that these cases do not actually have private LTCI coverage.

Informal Care Utilization

Survey File	MCBS (ASSIST)
Element	• HLPRBATH • HLPRDRES • HLPREAT • HLPRCHAR • HLPRWALK • HLPRTOIL • HLPRREL
Definition	Presence of Informal ADL Care
Considerations	The following MCBS fields identify whether the respondent receives help with the following HIPAA ADLs: • Bathing (HLPRBATH) • Dressing (HLPRDRES) • Eating (HLPREAT)

[42] Centers for Disease Control and Prevention. 2018 NHIS Questionnaire - Sample Adult. *National Center for Health Statistics*, Jun. 12, 2019, https://ftp.cdc.gov/pub/Health_Statistics/NCHS/Survey_Questionnaires/NHIS/2018/english/qadult.pdf

	• Toileting (HLPRTOIL) • Transferring (HLPRCHAR and HLPRWALK) Transferring is reported both in terms of getting in and out of bed or chairs as well as help with walking. In addition, the survey asks about the relationship of helpers (HLPRREL) to the respondent. In cases where a helper is denoted and identified as a relative or friend/neighbor, the help was considered to be informal care. Helper relationships that are considered formal care are: • Boarder • Nurse/Nurse's Aide • Legal/Financial Officer • Other

Length of Episode

Survey File	RAND HRS
Element	• RXXWALKRH • RXXBEDH • RXXDRESSH • RXXBATHH • RXXEATH • RXXTOILTH • RXXMEMRY (Rounds 4-9) • RXXALZHE, RXDEMEN (Rounds 10+)
Definition	Length of Disability Episode
Considerations	ADL and cognitive limitation information was used to determine disability status over time using various definitions of disability. Lengths of episode (LOEs) were imputed, and the resulting data was used to estimate distribution of LOE.

B.2 FACILITY POPULATION

Age Group

Survey File	MCBS (DEMO)
Element	H_AGE
Definition	Age
Considerations	The H_AGE field identifies the age of the survey respondent at the time the survey was administered.

Sex

Survey File	MCBS (DEMO)
Element	H_SEX
Definition	Sex
Considerations	The H_SEX field identifies the sex of the survey respondent at the time the survey was administered.

Region

Survey File	MCBS (DEMO)
Element	H_CENSUS
Definition	Region
Considerations	The H_CENSUS field identifies the region in which the survey respondent resides at the time the survey is administered.

Income

Survey File	MCBS (DEMO)
Element	INCOME_H
Definition	SP and spouse total income last year
Considerations	The household income identifies the total income received between the survey participant and spouse during the survey year.

Net Worth

Survey File	MCBS (INCASSET)
Element	• HOMEEVAL – Present value of SP home • HOMEOWE – Amount remaining on SP mortgage • SP401K1 – SP retirement account amount • FUND – Combined stock, mutual fund, bond amounts • SPACCT1 – Combined amount of SP checking, savings, and CD accounts • INTSP1 – SP interest/dividend accounts amount • LANDSP1 – Value of SP other assets • LUMPAMT – Amount of lump sum • CARS – Value of SP/spouse cars • Above fields associated with survey participant and spouse combined amounts.
Definition	Amount reported for various asset holdings
Considerations	Various fields associated with survey participant assets and liabilities are used to construct estimates of net worth. Assets are summed to estimate net worth. Net worth is calculated both including and excluding home equity fields.

ADL Disability

Survey File	MCBS (MDS3)
Element	• G0120B – ADL Assistance: Bathing Support Provided • G0110G2 – ADL Assistance: Dress Support Provided • G0110H2 – ADL Assistance: Eating Support Provided • G0110I2 – ADL Assistance: Toileting Support Provided • G0110B2 – ADL Assistance: Transfer Self Support Provided • G0110C2 – ADL Assistance: Walk in Room Support Provided • G0110D2 – ADL Assistance: Walk in Corridor Support Provided • H0300 – Urinary Continence • H0400 – Bowel Continence
Definition	Does respondent need help with task?
Considerations	These fields identify whether the respondent requires help for each of the six HIPAA ADLs: • Bathing (G0120B) • Dressing (G0110G2) • Eating (G0110H2) • Toileting (G0110I2) • Transferring (G0110B2, G0110C2, and G0110D2) • Incontinence (H0300, H0400) Transferring is reported both in terms of transferring, walking in a room, and walking in a corridor. MDS data is an administrative assessment, and there are a range of responses to ADL questions. The typical responses include: • No assisted/no information • Supervision required • Limited assistance required • Extensive assistance required • Total dependence • Activity did not occur In order to define ADLs for the institutional population, physical assistance or total dependence were counted as meeting the threshold of ADL disability.

Cognitive Impairment

Survey File	MCBS (MDS3)
Elements	• I4200 – Active Diagnosis: Alzheimer's • I4800 – Active Diagnosis: Dementia
Definition	Presence of Alzheimer's or Dementia
Considerations	These variables indicate whether the respondent has an active diagnosis of Alzheimer's or Dementia.

Length of Episode

Survey File	MCBS(FAE)
Elements	• Admission date year • Admission date month • Admission date day • Reference ending date year • Reference ending date month • Reference ending date day
Definition	Length of institutional episode
Considerations	The length of episode associated with each institutional episode can be calculated using the admission date and reference date. While many episodes are ongoing, it is assumed that the current distribution of lengths of episode is representative of the population, given the demographic profile observed in 2018.

Medicaid Coverage

Survey File	MCBS (HITLINE)
Elements	PLANTYPE
Definition	Medicaid Coverage
Considerations	PLANTYPE of '5' indicates Medicaid coverage at some point during the year.

Private Long-Term Care Insurance Coverage

Survey File	MCBS (FAE)
Elements	AMTPRVU
Definition	Amount paid by private insurance (unknown purchaser)
Considerations	Any record that reports an amount paid by private insurance is assumed to hold private LTCI.

Informal Care Utilization

Informal care utilization is not applicable to residents of an institution.

Expenditures by Payor

Survey File	MCBS (FAE)
Elements	• AMTTOT • AMTUCARE • AMTCAID • AMTPRVU • AMTOOP • AMTOTH
Definition	Expenditures associated with the institutional stay are reported by channel of payment. The payors considered include: Medicare, Medicaid, Private, OOP, and Other (including VA). All amounts are paid in 2018.
Considerations	Expenditures for the year 2018 are given, and expenditures for the total stay are estimated by calculating a per day amount and multiplying by the calculated length of episode.

Appendix C: LTC Episode Data Imputation Results

This section displays comparisons of imputed distributions in the LTCE dataset to the distributions of comparable data observed in the underlying data sources.

C.1 NET WORTH IMPUTATION—COMMUNITY

Table C.1.1

COMMUNITY HOUSEHOLD NET WORTH DISTRIBUTIONS

Household Net Worth ($)	SIPP	LTCE
Less than or equal to 50,000	37.3%	41.0%
50,000-99,999	9.0%	7.7%
100,000-499,999	29.1%	27.0%
500,000-999,999	10.9%	11.1%
1,000,000 and over	13.7%	13.1%

Table C.1.2

COMMUNITY HOUSEHOLD NET WORTH DISTRIBUTIONS, BY AGE GROUP

Age Group	Survey	<= $50,000	$50,000-99,999	$100,000-499,999	$500,000-999,999	$1,000,000 and over
18-44	SIPP	49.9%	10.2%	25.7%	7.0%	7.1%
18-44	LTCE	55.0%	9.2%	23.7%	6.4%	5.7%
45-64	SIPP	29.9%	8.3%	31.6%	13.0%	17.3%
45-64	LTCE	33.8%	7.3%	30.3%	12.6%	16.0%
65-74	SIPP	22.4%	6.9%	30.5%	16.5%	23.7%
65-74	LTCE	25.8%	7.4%	23.1%	17.6%	26.0%
75-84	SIPP	21.4%	7.3%	34.7%	15.6%	21.0%
75-84	LTCE	15.4%	1.8%	34.0%	22.8%	26.0%
85+	SIPP	20.5%	7.9%	39.3%	14.5%	17.9%
85+	LTCE	21.8%	2.2%	46.0%	17.1%	12.8%

Table C.1.3

COMMUNITY HOUSEHOLD NET WORTH DISTRIBUTIONS, BY SEX

Sex	Survey	<= $50,000	$50,000-99,999	$100,000-499,999	$500,000-999,999	$1,000,000 and over
Male	SIPP	36.3%	9.2%	29.4%	11.0%	14.2%
Male	LTCE	39.2%	8.4%	28.2%	10.8%	13.4%
Female	SIPP	38.2%	8.8%	28.9%	10.8%	13.3%
Female	LTCE	42.7%	7.1%	25.9%	11.4%	12.9%

Table C.1.4

COMMUNITY HOUSEHOLD NET WORTH DISTRIBUTIONS, BY REGION

Region	Survey	<= $50,000	$50,000-99,999	$100,000-499,999	$500,000-999,999	$1,000,000 and over
Northeast	SIPP	34.0%	8.4%	29.7%	12.3%	15.6%
Northeast	LTCE	31.4%	7.4%	32.2%	14.0%	15.0%
Midwest	SIPP	37.5%	9.2%	31.4%	10.4%	11.5%
Midwest	LTCE	39.9%	9.7%	27.7%	10.0%	12.7%
South	SIPP	40.1%	10.6%	28.2%	9.4%	11.6%
South	LTCE	48.6%	7.7%	24.4%	9.5%	9.7%
West	SIPP	35.2%	6.5%	28.2%	12.6%	17.5%
West	LTCE	37.0%	6.3%	26.7%	12.4%	17.5%

Table C.1.5

COMMUNITY HOUSEHOLD NET WORTH DISTRIBUTIONS, BY INDIVIDUAL INCOME GROUP

Income Group	Survey	<= $50,000	$50,000-99,999	$100,000-499,999	$500,000-999,999	$1,000,000 and over
<$25,000	SIPP	48.0%	9.1%	25.3%	8.4%	9.3%
<$25,000	LTCE	54.1%	7.2%	22.6%	7.4%	8.8%
$25,000-$49,999	SIPP	40.1%	10.1%	30.0%	9.6%	10.2%
$25,000-$49,999	LTCE	47.2%	8.8%	22.9%	12.6%	8.5%
$50,000-$74,999	SIPP	27.3%	9.8%	35.4%	13.5%	14.0%
$50,000-$74,999	LTCE	28.1%	9.3%	37.6%	10.9%	14.1%
$75,000-$124,999	SIPP	14.6%	7.7%	39.1%	18.1%	20.5%
$75,000-$124,999	LTCE	15.0%	6.8%	38.0%	17.5%	22.6%
$125,000+	SIPP	7.1%	3.8%	24.2%	17.3%	47.7%
$125,000+	LTCE	7.0%	4.2%	23.3%	18.0%	47.5%

Table C.1.6

COMMUNITY HOUSEHOLD NET WORTH DISTRIBUTIONS, BY MEDICAID STATUS

Medicaid	Survey	<= $50,000	$50,000-99,999	$100,000-499,999	$500,000-999,999	$1,000,000 and over
Eligible	SIPP	69.6%	7.9%	16.6%	3.6%	2.3%
Eligible	LTCE	69.0%	8.6%	16.7%	3.9%	1.9%
Non-Eligible	SIPP	32.8%	9.1%	30.9%	11.9%	15.3%
Non-Eligible	LTCE	35.7%	7.6%	29.0%	12.5%	15.3%

C.2 ADL IMPUTATION—COMMUNITY

Table C.2.1
COMMUNITY ADL DISTRIBUTIONS

ADL Count	NHIS	LTCE
1	24.1%	21.5%
2	23.0%	25.9%
3+	52.9%	52.7%

Table C.2.2
COMMUNITY ADL DISTRIBUTIONS, BY AGE GROUP

Age Group	Survey	1 ADL	2 ADLs	3+ ADLs
18-29	NHIS	20.9%	28.2%	50.9%
18-29	LTCE	10.3%	13.6%	76.2%
30-44	NHIS	19.4%	15.7%	64.9%
30-44	LTCE	18.9%	17.7%	63.4%
45-64	NHIS	22.4%	29.2%	48.4%
45-64	LTCE	17.0%	39.7%	43.3%
65-69	NHIS	25.8%	22.2%	52.0%
65-69	LTCE	35.9%	21.2%	42.9%
70-74	NHIS	32.8%	22.2%	45.0%
70-74	LTCE	21.2%	26.4%	52.4%
75-79	NHIS	26.3%	17.1%	56.6%
75-79	LTCE	29.8%	13.7%	56.5%
80-84	NHIS	24.0%	23.6%	52.5%
80-84	LTCE	21.5%	22.9%	55.7%
85+	NHIS	23.2%	19.7%	57.2%
85+	LTCE	21.9%	27.0%	51.1%

Table C.2.3
COMMUNITY ADL DISTRIBUTIONS, BY SEX

Sex	Survey	1 ADL	2 ADLs	3+ ADLs
Male	NHIS	24.2%	23.0%	52.8%
Male	LTCE	16.2%	31.8%	52.0%
Female	NHIS	24.0%	23.0%	53.0%
Female	LTCE	24.7%	22.3%	53.1%

Table C.2.4

COMMUNITY ADL DISTRIBUTIONS, BY REGION

Region	Survey	1 ADL	2 ADLs	3+ ADLs
Northeast	NHIS	27.3%	18.3%	54.4%
Northeast	LTCE	22.9%	22.1%	55.0%
Midwest	NHIS	30.7%	32.4%	36.9%
Midwest	LTCE	25.1%	30.4%	44.5%
South	NHIS	21.7%	23.3%	55.0%
South	LTCE	21.2%	27.0%	51.9%
West	NHIS	19.9%	18.7%	61.4%
West	LTCE	17.6%	22.5%	59.9%

Table C.2.5

COMMUNITY ADL DISTRIBUTIONS, BY INDIVIDUAL INCOME GROUP

Income Group	Survey	1 ADL	2 ADLs	3+ ADLs
Less than $25,000	NHIS	24.4%	22.1%	53.6%
Less than $25,000	LTCE	21.6%	26.1%	52.3%
$25,000-$49,999	NHIS	17.8%	57.2%	24.9%
$25,000-$49,999	LTCE	18.2%	31.2%	50.7%
$50,000-$74,999	NHIS	0.0%	43.9%	56.1%
$50,000-$74,999	LTCE	34.9%	8.2%	56.9%
$75,000-$124,999	NHIS	44.9%	55.1%	0.0%
$75,000-$124,999	LTCE	14.1%	22.2%	63.7%
$125,000+	NHIS	0.0%	29.8%	70.2%
$125,000+	LTCE	100.0%	0.0%	0.0%

Table C.2.6

COMMUNITY ADL DISTRIBUTIONS, BY MEDICAID STATUS

Medicaid Status	Survey	1 ADL	2 ADLs	3+ ADLs
Eligible	NHIS	26.5%	24.4%	49.2%
Eligible	LTCE	22.6%	29.3%	48.1%
Non-Eligible	NHIS	19.9%	20.7%	59.5%
Non-Eligible	LTCE	20.5%	22.8%	56.8%

C.3 PRIVATE LTCI IMPUTATION—COMMUNITY

Table C.3.1
COMMUNITY LTCI DISTRIBUTIONS

Private LTCI	HRS	LTCE
No	93.2%	93.8%
Yes	6.9%	6.2%

Table C.3.2
COMMUNITY LTCI DISTRIBUTIONS, BY HOUSEHOLD NET WORTH GROUP

Net Worth Group	Survey	Private LTCI	No LTCI
Less than 50,000	HRS	1.2%	98.8%
Less than 50,000	LTCE	1.4%	98.6%
50,000- 99,999	HRS	2.3%	97.8%
50,000- 99,999	LTCE	3.4%	96.6%
100,000-499,999	HRS	6.2%	93.8%
100,000-499,999	LTCE	5.5%	94.5%
500,000+	HRS	14.0%	86.0
500,000+	LTCE	10.7%	89.3%

Table C.3.3
COMMUNITY LTCI DISTRIBUTIONS, BY SEX

Sex	Survey	Private LTCI	No LTCI
Male	HRS	6.2%	93.8%
Male	LTCE	5.8%	94.3%
Female	HRS	7.4%	92.6%
Female	LTCE	6.4%	93.6%

Table C.3.4
COMMUNITY LTCI DISTRIBUTIONS, BY REGION

Region	Survey	Private LTCI	No LTCI
Northeast	HRS	6.3%	93.7%
Northeast	LTCE	7.3%	92.7%
Midwest	HRS	7.8%	92.3%
Midwest	LTCE	5.4%	94.6%
South	HRS	6.6%	93.4%
South	LTCE	5.9%	94.1%
West	HRS	6.8%	93.2%
West	LTCE	6.2%	93.8%

Table C.3.5
COMMUNITY LTCI DISTRIBUTIONS, BY MEDICAID ELIGIBILITY

Medicaid Status	Survey	Private LTCI	No LTCI
Eligible	HRS	0.4%	99.7%
Eligible	LTCE	0.5%	99.5%
Non-Eligible	HRS	7.5%	92.5%
Non-Eligible	LTCE	6.9%	93.1%

C.4 INFORMAL CARE IMPUTATION—COMMUNITY

Table C.4.1
INFORMAL CARE DISTRIBUTIONS

Informal Care	MCBS	LTCE
No	32.0%	29.3%
Yes	68.0%	70.7%

Table C.4.2
INFORMAL CARE DISTRIBUTIONS, BY HOUSEHOLD NET WORTH GROUP

Asset Group	Survey	Informal Care	No Informal Care
Less than 25,000	MCBS	68.1%	31.9%
Less than 25,000	LTCE	70.9%	29.1%
25,000-99,999	MCBS	66.2%	33.8%
25,000-99,999	LTCE	72.0%	28.0%
100,000-249,999	MCBS	65.8%	34.2%
100,000-249,999	LTCE	73.9%	26.1%
250,000 or more	MCBS	78.7%	21.4%
250,000 or more	LTCE	68.3%	31.7%

Table C.4.3
INFORMAL CARE DISTRIBUTIONS, BY SEX

Sex	Survey	Informal Care	No Informal Care
Male	MCBS	61.0%	39.1%
Male	LTCE	69.7%	30.3%
Female	MCBS	72.4%	27.6%
Female	LTCE	71.3%	28.7%

Table C.4.4
INFORMAL CARE DISTRIBUTIONS, BY REGION

Region	Survey	Informal Care	No Informal Care
Northeast	MCBS	61.9%	38.1%
Northeast	LTCE	70.9%	29.1%
Midwest	MCBS	62.8%	37.2%
Midwest	LTCE	74.8%	25.3%
South	MCBS	70.6%	29.4%
South	LTCE	68.5%	31.5%
West	MCBS	72.7%	27.3%
West	LTCE	71.5%	28.5%

Table C.4.5
INFORMAL CARE DISTRIBUTIONS, BY MEDICAID STATUS

Medicaid Status	Survey	Informal Care	No Informal Care
Eligible	MCBS	71.1%	28.9%
Eligible	LTCE	72.3%	27.7%
Non-Eligible	MCBS	66.6%	33.4%
Non-Eligible	LTCE	69.1%	30.9%

C.5 LENGTH OF EPISODE IMPUTATION—COMMUNITY

Weibull distributions are used to estimate the continuance rates for various population cohorts. The cumulative density function is defined as:

$F(x) = 1 - e^{-\left(\frac{x}{\alpha}\right)^{\beta}}$, where α is the scale parameter and β is the shape parameter.

Table C.5.1

MALE COMMUNITY LENGTH OF EPISODE, SCALE PARAMETER

Age	<65	65-74	75-84	85+
CI	2,550	1,967	1,383	800
1+ ADL	2,300	1,767	1,233	700
2+ ADL	1,750	1,425	1,100	775
3+ ADL	1,200	1,083	967	850
1+ ADL/CI	2,500	1,900	1,300	700
2+ ADL/CI	2,075	1,625	1,175	725
3+ ADL/CI	1,650	1,350	1,050	750

Table C.5.2

MALE COMMUNITY LENGTH OF EPISODE, SHAPE PARAMETER

Age	<65	65-74	75-84	85+
CI	1.00	1.13	1.27	1.40
1+ ADL	1.10	1.17	1.23	1.30
2+ ADL	1.05	1.15	1.25	1.35
3+ ADL	1.00	1.13	1.27	1.40
1+ ADL/CI	1.00	1.00	1.00	1.00
2+ ADL/CI	0.95	0.98	1.02	1.05
3+ ADL/CI	0.90	0.97	1.03	1.10

Table C.5.3

FEMALE COMMUNITY LENGTH OF EPISODE, SCALE PARAMETER

Age	<65	65-74	75-84	85+
CI	2,500	1,933	1,367	800
1+ ADL	2,600	2,033	1,467	900
2+ ADL	1,975	1,608	1,242	875
3+ ADL	1,350	1,183	1,017	850
1+ ADL/CI	2,700	2,100	1,500	900
2+ ADL/CI	2,300	1,833	1,367	900
3+ ADL/CI	1,900	1,567	1,233	900

Table C.5.4

FEMALE COMMUNITY LENGTH OF EPISODE, SHAPE PARAMETER

Age	<65	65-74	75-84	85+
CI	1.10	1.20	1.30	1.40
1+ ADL	1.10	1.13	1.17	1.20
2+ ADL	1.05	1.10	1.15	1.20
3+ ADL	1.00	1.07	1.13	1.20
1+ ADL/CI	1.00	1.03	1.07	1.10
2+ ADL/CI	1.00	1.03	1.07	1.10
3+ ADL/CI	1.00	1.03	1.07	1.10

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