U.S. Department of Health and Human Services
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Office of Behavioral Health, Disability, and Aging Policy

PROJECTIONS OF RISK OF NEEDING LONG-TERM SERVICES AND SUPPORTS AT AGES 65 AND OLDER

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ACRONYMS

The following acronyms are mentioned in this report and/or appendix.

AALTCI	American Association for Long-Term Care Insurance
ADL	Activity of Daily Living
CBO	Congressional Budget Office
COVID-19	Novel Coronavirus
DYNASIM	Dynamic Simulation of Income Model
GAO	Government Accountability Office
GDP	Gross Domestic Product
HCBS	Home and Community-Based Services
HIPAA	Health Insurance Portability and Accountability Act
HMO	Health Maintenance Organization
HRS	Health and Retirement Study
IADL	Instrumental Activity of Daily Living
LTCI	Long-Term Care Insurance
LTSS	Long-Term Services and Supports
MACPAC	Medicaid and CHIP Payment and Access Commission
MCBS	Medicare Current Beneficiary Survey
NHATS	National Health and Aging Trends Study
NHEA	National Health Expenditure Accounts
NLTCS	National Long-Term Care Survey
OASDI	Old-Age Survivors and Disability Insurance
OOP	Out-Of-Pocket
PDV	Present Discounted Value
QI	Qualified Individual
QMB	Qualified Medicaid Beneficiary
SCI	Severe Cognitive Impairment
SIPP	Survey of Income and Program Participation

SLMB	Specified Low-Income Beneficiary
SSI	Supplemental Security Income
TICS	Telephone Interview of Cognitive Status

INTRODUCTION

This memorandum provides our current projections of the risk of needing long-term services and supports (LTSS) from age 65 to death from the Urban Institute's Dynamic Simulation of Income Model, version 4 (*DYNASIM4*).[1] We present projections of the durations of LTSS needs and use, the types of settings in which they are provided (home care, residential care, and nursing homes), and the costs of formal services. We then describe who bears these costs, considering government payers like Medicaid and other public sources (such as the U.S. Department of Veterans Affairs)[2] as well as private payers, including families and long-term care insurance (LTCI) companies. We focus on LTSS needs that meet the criteria set in the Health Insurance Portability and Accountability Act (HIPAA). We also add preliminary projections of unpaid care.[3] We begin with a brief background discussion and summary of our methods.

[1] The terms DYNASIM are used, referring to the model broadly, and DYNASIM4, referring to the specific release of the model used for these analyses, interchangeably in this report.

[2] In prior versions of this report, we also included an estimate of Medicare LTSS spending. As we describe in Box 1, we have decided not to include this estimate in this report.

[3] These preliminary projections use relatively simple methods. Forthcoming Urban Institute work for ASPE will expand these projections.

BACKGROUND

The United States population is aging rapidly. Over the next 25 years, the share of the population that is over age 65 is expected to increase from just under 15 percent to over 20 percent (Figure 1). Shares that are older than age 85 will begin to increase in about a decade, climbing from about 2 percent today to about 3 percent by 2035 and 4 percent by the mid-2040s. Because rates of LTSS needs and use are comparatively high at older ages (Figure 2), the number of people with LTSS needs should thus increase steadily in coming decades.

Both the private and public implications of the increased demand for care are likely to be profound. Those family caregivers who step in to help aging relatives often face emotional and financial burdens (Pinquart and Sorensen 2003, 2007; Roth et al. 2009; Spillman et al. 2014); many are stretched thin because they are employed full-time or raising children while they are providing support.[4] The federal budget will need to accommodate increased LTSS expenditures at the same time that it already faces other underfunded obligations to the aging population, including commitments to Social Security and Medicare benefits (Board of Trustees, Federal Old-Age and Survivors Insurance and Disability Insurance Trust Funds 2019; Boards of Trustees of the Federal Hospital Insurance and Federal Supplementary Medical Insurance Trust Funds 2019; CBO 2019), and budget pressures associated with the novel coronavirus (COVID-19) pandemic. State legislators frequently identify growth in Medicaid expenditures as a pressing fiscal concern.

Although the coming growth in the older population with LTSS needs has been forecast for years, the United States still lacks a national policy for financing LTSS for all who might need it. Most Americans who receive formal LTSS pay out-of-pocket (OOP) until their personal resources are exhausted and then rely on the Medicaid safety net. Some Americans purchase private LTCI, which covers costs up to a specified amount and period, but coverage rates remain low (Johnson and Park 2011). Sales figures from recent years suggest there has been stagnation, or even decline, in the market (Cohen 2014, 2016; Schmitz and Giese 2019; Ujvari 2018). In 2018, just 276,000 people received benefits from LTCI and about 6.58 million people--less than 6 percent of the population ages 50 and older--had active plans (NAIC 2019). Many researchers have speculated about why LTCI does not have broader reach, positing, for example, that the existence of Medicaid may crowd out private insurance (Brown and Finkelstein 2007). Medicare covers some services under certain time-limited circumstances, but the program was not designed to cover much LTSS.

[4] Spillman et al. (2014) highlight the role of high intensity of care in contributing to negative effects of caregiving. They report further that many caregivers report positive consequences of providing care. These include closer relationships to the person to whom they give care, satisfaction that he/she is well cared for, and greater confidence in one's abilities, including abilities to deal with difficult situations.

There is need for better information about whether this financing system could be re-organized to finance and deliver services more efficiently, so that fewer Americans would experience catastrophic out-of-pocket costs or need to rely on a means-tested program when a family member becomes frail. Several policy groups and commissions have highlighted the challenges and proposed various solutions (Bipartisan Policy Center 2014, 2017; Commission on Long-Term Care 2013; LeadingAge Pathways 2013; Long-Term Care Financing Collaborative 2016; O'Leary 2014). Such groups could benefit from tools that would enable them to evaluate the potential efficacy of their proposals using a consistent approach.

An important first step in developing and evaluating such LTSS financing policies is to understand the distribution of LTSS needs and costs under the current set of institutional arrangements. A second step in formulating more effective LTSS policies is to develop and use models that show how alternative financing arrangements might affect the distribution of LTSS costs for various payers.

Previous researchers have described the distributions of lifetime LTSS needs.[5] For example, Kemper et al. (2005/2006) project LTSS needs and costs after age 65 for adults reaching that milestone in 2005. They estimate that 69 percent of this population will experience LTSS needs defined as one or more limitations in activities of daily living (ADLs), four or more limitations in instrumental activities of daily living (IADLs), or the receipt of formal services other than strictly post-acute services. Average duration of LTSS need at this level is three years. They note that the distribution of needs is skewed, with three in ten adults needing no care after age 65 but two in ten needing care for five or more years. Women, moreover, will receive more care than men--about 3.7 years on average compared to 2.2 years. Kemper et al. (2005/2006) also present cost estimates and show that families and Medicaid pay the largest shares. Their estimates highlight the financial uncertainty that LTSS risks impose on families; many will not incur any expenses, but a significant minority will face large out-of-pocket burdens.

Stallard (2011) examines individuals' disability and LTSS experiences using 1984-1994 data from the National Long-Term Care Survey (NLTCS).[6] He disentangles HIPAA and nonHIPAA-level care and finds that from age 65 onward, women averaged 2.04 years of paid LTSS at the HIPAA level (and 2.98 years of paid care total), while men averaged 0.90 years at the HIPAA level (and 1.20 years total). For men and women combined, paid services lasted on average 1.53 years at

[5] Other studies examine LTSS needs at a point in time (Colello 2018; CBO 2013; Kaye, Harrington and LaPlante 2010; O'Shaughnessy 2014). Another branch of this literature examines specific components of disability, for example expected duration of cognitive impairment (for example, Brookmeyer et al. 2002; Larson et al. 2004; Lièvre, Alley, and Crimmins 2008; Murtaugh, Spillman and Wang 2011; Suthers, Kim and Crimmins 2003). In the interest of brevity, we focus here on studies of HIPAA-level disability without disaggregating into its components (e.g., periods with ADL limitations only, periods with cognitive impairment only, period with both ADL limitations and cognitive impairment). Our forthcoming paper on cognitive impairment projections (Favreault and Johnson 2020) reviews many studies in that area.

[6] Other recent studies include Brown and Warshawsky (2013), Friedberg et al. (2014) and Hurd, Michaud, and Rohwedder (2013).

the HIPAA level (and 2.19 years total). This use translates into average costs of about $75,000 for HIPAA-level services (in 2000 constant dollars) and nearly $82,000 when nonHIPAA-level care is included.

One important study that simulated alternative LTSS financing options is Wiener, Illston, and Hanley (1994), published 26 years ago. The authors developed a baseline projection of LTSS needs and payers and simulated a range of LTSS financing alternatives, including an expanded package of Medicaid benefits, the introduction of social insurance, and public subsidies for private insurance. Within each of these alternatives, the authors examined the impact of key parameters, varying, for example, the extent to which proposals covered costs families incur early in a disability spell ("front-end") or costs incurred after a person has disabled for a long time ("back-end" costs) or focused on institutional care versus home and community-based services (HCBS). Rivlin and Wiener (1988) examined a similar range of policy options but also considered some alternatives, such as home equity conversions.[7] Tumlinson et al. (2013) conducted a more recent study using a somewhat less elaborate model (described in Broyles et al. 2010). In the aftermath of the repeal of the Community Living Assistance Services and Supports Act, they juxtaposed the effects of mandatory and voluntary LTSS financing approaches, with a focus on premium prices and potential Medicaid savings.

We build on these earlier efforts, bringing in more recent data that capture up-to-date demographic, social, and economic patterns, including the distinctive employment, health, and family outcomes for the Baby Boom cohort now entering old-age, defined here as age 65 and older. It is also important to capture the on-going shift from institutional to community-based settings for delivering LTSS.[8] We use a different underlying microsimulation model--DYNASIM--that has been validated for a wide range of retirement policy applications and includes many sophisticated processes that interact with LTSS use, such as a detailed Medicare spending module (Hatfield et al. 2016).

Favreault and Dey (2016) used DYNASIM3 to project LTSS needs and expenses. Johnson, Toohey, and Wiener (2007) used an even earlier version of DYNASIM to project LTSS needs and utilization patterns under three alternative scenarios about how disability rates are likely to evolve in coming decades. They projected likely LTSS needs, service use, and family caregiver availability. We extend their work to incorporate more recent data and more information about care settings and LTSS payers. The latest version of DYNASIM, for example, models residential care and includes detailed algorithms for determining eligibility for Medicaid LTSS and projecting the spenddown of household wealth by families with large out-of-pocket expenditures on acute care and LTSS.

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[7] Another study from around this same time period, less detailed in its description of projection methods, is Cohen et al. (1992). Crown, Burwell, and Alecxih (1994) also examine a specific subset of LTSS financing changes, increases in Medicaid asset tests for nursing homes. Kemper, Spillman, and Murtaugh (1991) similarly focus on nursing home policies.

[8] For example, Eiken, Sredl, Gold, et al. (2014), Eiken et al. (2015a), and Eiken et al. (2015b), and Eiken et al. (2017) discuss how this is playing out in the Medicaid context.

As a large literature documents (e.g., Reinhard et al. 2019), family caregivers are a crucial resource to older adults with disabilities. Many older adults with severe disabilities are able to stay in their homes much longer than they could have on their own (Spillman 2016)--sometimes even until their deaths--because they are supported by family and friends. However, despite the large, often heroic efforts of family caregivers, evidence suggests that some older adults experience adverse consequences due to unmet LTSS needs (Allen, Piette and Mor 2014; Freedman and Spillman 2014; Komisar, Feder and Kasper 2005), underscoring the need to examine LTSS financing policies.

WHY USE DYNAMIC MICROSIMULATION?

One advantage of using dynamic microsimulation to model detailed LTSS needs, taxes, and public benefits is the ability to ask a wide range of "what if?" questions about policy changes. For example, we can consider how new social insurance programs could shift cost burdens for LTSS. We can ask what would happen if Medicaid asset test rules were tightened or loosened or if the trend toward greater provision of home-based services were to continue. We can also model the effects of future changes in other model functions. For example, we can examine how our projections would change if longevity were to increase more or less rapidly than the Old-Age Survivors and Disability Insurance (OASDI) Trustees anticipate, if disability rates were to increase or decrease relative to our assumptions, or if effective treatments for dementia were to emerge.[9]

An important advantage of dynamic microsimulation models is their ability to capture how life circumstances, including health outcomes, differ by demographic characteristics and various aspects of socioeconomic status (for example, education and lifetime earnings). These models allow analysts to look at the full distribution of outcomes, not just averages, for the overall population and for various subgroups.

[9] Improving treatment options for Alzheimer's disease is a priority area for the Federal Government (HHS 2019).

DATA AND METHODS

DYNASIM4 is a dynamic microsimulation model designed to analyze the long-run distributional consequences of retirement and aging issues. Starting with a representative sample of individuals and families, the model "ages" the data year-by-year, simulating such demographic events as births, deaths, marriages and divorces, and such economic and health events as labor force participation, earnings, hours of work, disability onset and recovery, retirement, and use and costs of LTSS. As the model ages the population, it calibrates many key demographic and economic outcomes to the intermediate assumptions of the Social Security and Medicare Trustees' Reports (Board of Trustees, Federal Old-Age and Survivors Insurance and Disability Insurance Trust Funds 2019; Boards of Trustees of the Federal Hospital Insurance and Federal Supplementary Medical Insurance Trust Funds 2019).[10] Because we rely on historic data and 2019 trustees report assumptions, the projections do not account for the COVID-19 outbreak's on-going demographic and economic effects. The model projects outcomes through 2093, the end of the 75-year forecasting horizon for many government programs, generating lifetime projections for some cohorts and projections covering much of the life course for others.[11]

DYNASIM4's starting population is a sample from the pooled 2004 and 2008 panels of the Survey of Income and Program Participation (SIPP). To age the population, we estimate transition and other equations using an array of high-quality longitudinal data sources. DYNASIM's LTSS projections draw information from a wide range of cross-sectional and longitudinal sources, including the Health and Retirement Study (HRS), Medicare Current Beneficiary Study (MCBS), and National Health and Aging Trends Survey (NHATS). Because DYNASIM's underlying population is nationally representative, its weighted projections yield national totals for various population groups and for program costs. Although the model's focus is distributional, it can thus also be used to determine relative costs of various interventions.

Appendix Tables A1-A4 provide summary information on the specification of our LTSS models, with a focus on our health and disability measures (Appendix Table A1), presence and

[10] We calibrate fertility, mortality, net immigration, covered employment rates, and Disability Insurance prevalence by age and sex. Economy-wide wage and price growth, and all the Social Security parameters that are based on them, follow the Trustees' intermediate series, as does the share of total earnings that falls below the annual cap on earnings subject to Social Security taxes (known as the taxable share). This share reflects earnings dispersion, in that earnings are more likely to exceed the taxable cap when the earnings distribution is relatively skewed. We also calibrate DYNASIM to Medicare projections, particularly by matching the Medicare Trustees' excess cost growth assumptions--the amount by which Medicare spending outpaces GDP growth. This is important because the Trustees expect Medicare costs to grow significantly under current law. Because many older adults qualify for Medicaid through the system's medically needy programs, medical cost growth materially affects the likelihood and prevalence of Medicaid eligibility.

[11] Nearer-term projections are more reliable than the much less certain longer-term projections. Even though such distant projections are highly speculative, they help capture lifetime experience, which improves our understanding of the nature of LTSS financing risks.

quantity of LTSS use (Appendix Table A2), LTSS payer attribution (Appendix Table A3), and Medicare and Medicaid assignments (Appendix Table A4). The appendix tables describe each model's functional form, predictors, and estimation data source and sample. Detail on other functions, like earnings, pensions, and wealth, are available in companion documents, such as Favreault, Smith, and Johnson (2015) and Smith, Favreault, and Johnson (2014).

As the tables indicate, the HRS underlies the models of health, disability status (including limitations in ADLs and IADLs and cognitive impairment),[12] LTSS use, and private LTCI coverage. These models are highly interdependent. For example, earlier processes predict subsequent processes, and we model some processes jointly, such as use of nursing home, home care, and residential care. We typically employ complex econometric specifications in our models to capture patterns over time. Most equations incorporate many predictor variables, including age, education, income, marital status and spouse disability, nativity, race/ethnicity, presence of children, and other attributes.

One challenge is how to capture trends in LTSS outcomes. When trends are clear, such as long-range declines in mortality,[13] we follow the trustees' assumptions. Otherwise, we typically assume that the underlying propensity to develop LTSS needs or use LTSS continues at current levels, but that the aggregate rates observed change as the composition of the population shifts. For example, as the population becomes better educated, more people in the population will experience the rates for more highly educated adults, but the rate for an adult with a certain level of education will not change. Modeling choices become difficult, however, when there is no scientific consensus about long-term trends, such as with disability.[14] In the case of ADL and IADL disability, we resolve the issue by basing projections on relative age--years of remaining life expectancy--and assuming that longevity-adjusted disability rates remain

[12] We model scores from the Telephone Interview for Cognitive Status (TICS) in the HRS (Ofstedal, Fisher and Herzog 2005). This is a standardized battery of questions to assess memory and cognitive status. The survey asks self-respondents to rate their memory and any changes in their memory since the previous interview, and then administers a cognitive test. The test asks respondents to repeat a list of ten nouns immediately and again five minutes later; subtract 7 from 100 and then subtract 7 from the result successively another four times; and count backwards from 20. Respondents are also asked to identify the date and day of the week, the current United States president and vice president, and two common objects ("cactus" and "scissors") based on the interviewer's description. We use these responses to create a cognitive index score by awarding one point for each correct answer (or component of an answer), for a maximum total of 35 points. We classify respondents as having severe cognitive impairment if they score 7 or fewer points and mild cognitive impairment if they score between 8 and 13 points.

[13] In recent years, the United States has witnessed some short run increases in mortality for some age groups (Woolf and Schoomaker 2019).

[14] One recent comprehensive study of several datasets concludes that trends in old-age disability may vary by age (Freedman et al. 2013). Different measures of disability yield significantly different estimates of disability prevalence (for example, Freedman and Spillman 2014b).

constant across cohorts for adults at the same relative age.[15] All else equal, projected disability rates will fall over time when measured at years since birth--standard age--because longevity is increasing--consistent with hypotheses about the compression of morbidity (Cutler, Ghosh and Landrum 2014). However, changes in modeled risk factors could offset these increases.

To model LTSS payments, we estimate a range of parameters from MCBS data and develop a range of algorithms to simulate eligibility for public insurance programs. DYNASIM assigns personal income and payroll taxes and eligibility for means-tested public programs using rules and laws; the model effectively mimics tax forms and the application and eligibility verification processes for various public programs.[16] For voluntary public programs like Supplemental Security Income (SSI) and Medicaid, some individuals choose not to apply for benefits for which they are eligible (i.e., take-up is generally below 100 percent). We draw from the literature to assign SSI and Medicaid take-up levels using algorithms and equations that take into account need, as the literature tends to show that take-up is higher for those with lower income and assets.[17] We calibrate participation parameters so that DYNASIM Medicaid projection results track Medicaid Statistical Information System data over the period for which historical information is available (currently 2011). Likewise, when we model private LTCI payments for LTSS, we use a rule-based approach and take into account features of the simulated plans, including elimination periods, lifetime and daily benefit maxima, and inflation protection.

[15] We define relative age based on life expectancy in 2002, the midpoint of our HRS estimation sample. We assume that healthy life expectancy increases a half year for every full year of increase in total life expectancy. In one recent comparative study that looked at many countries, Salomon et al. (2012) estimate that the ratio of health life expectancy gain to total life expectancy gain falls with age. They find that one year of life expectancy gain leads to about 0.85 years of healthy life expectancy at birth, but only about 0.75 years at age 50, suggesting our estimate of half at age 65 is reasonable in a comparative framework. Looking at older ages and focusing on the United States population, Manton, Gu, and Lowrimore (2008) estimate a more favorable situation, with gains in healthy life expectancy (relative to total life expectancy) of about 73-80 percent at age 75 and 71-79 percent at age 85. This suggests we might consider a somewhat more aggressive assumption. We maintain the more conservative assumption to limit the chance of underpricing products that cover LTSS expenses.

[16] The tax calculator uses annual projected tax unit income and assets from the SIPP panels matched to a Statistics of Income (SOI) data file that includes itemized deductions and other variables needed to calculate income tax. The tax calculator assumes current law federal income tax rules, including the provisions in the Tax Cut and Jobs Act of 2017 (TCJA). Tax provisions affecting the treatment of Social Security benefits have not changed since 1993, but the share of Social Security benefits included in taxable income is continually increasing under current law partly because the threshold levels for including benefits in taxable income are not indexed for inflation. The tax calculator requires information about future tax law. Other than the Social Security thresholds, DYNASIM inflates thresholds by projected changes in the CPI, as under current law. We also allow the TCJA provisions to sunset, as under current law.

[17] For example, Caswell and Waidmann (2017), Ettner (1997), Gardner and Gilleskie (2012), Pezzin and Kasper (2002), Rupp and Sears (2000), Sears (2001/2002), and GAO (2012) consider Medicaid take up. There are important challenges in measuring Medicaid eligibility given that datasets that effectively measure disability and service use do not always measure income and assets comprehensively. Our take-up parameters tend to fall on the high side of the literature, consistent with those studies that rely on matched survey data (e.g., Caswell and Waidmann 2017, Sears 2001/2002), which is likely to be more reliable than survey data alone.

How one defines the Medicaid baseline is a very important assumption. Under current law, the program's coverage is expected to erode because of Medicaid's indexing (and lack of indexing). Moreover, the current is currently undergoing transformation, especially with regard to provision of LTSS, where rebalancing has now been underway for decades (Eiken 2016, 2017; Eiken et al. 2018; Eiken et al. 2015a; Eiken et al. 2015b; Eiken et al. 2017). Different forecasting groups address these issues differently. The Congressional Budget Office (CBO 2016) assumes that states will partly offset erosion in the long run.[18] The *Medicaid Actuarial Report* (Truffer, Wolfe and Rennie 2016; Wolfe, Rennie and Truffer 2017)[19] does not forecast enrollment and expenses over a longer range, just for a ten-year window. The report's developers thus have a less compelling need to address the issue of erosion of program parameters, which is a larger problem in the long term. But they do assume a continued trend toward rebalancing and managed care in the near term.

In DYNASIM, we broadly follow the CBO convention, and allow some erosion of Medicaid due to the indexing provisions, but not project complete erosion.

We set current and past LTSS prices equal to average or median prices reported in the literature by state of residence, setting (home care, residential care, nursing home), and whether Medicaid is the payer (Genworth 2014, 2015, 2016, 2017, 2018, 2019; Eljay 2014; Eljay and Hansen Hunter 2016, 2017; Fossett and Burke 2010; Grabowski et al. 2004; Hansen Hunter 2018; Mollica 2009; Ng et al. 2014). Prices vary markedly across states. Within states, Medicaid prices tend to be substantially lower than overall prices, and much lower than Medicare prices for similar services.[20] For those not receiving Medicare, services, DYNASIM assigns higher prices. For those paying out-of-pocket, DYNASIM varies LTSS prices somewhat based on income, so that some lower-income families use lower-cost providers--especially for home care. DYNASIM also assumes that some higher-income families--especially those covered by private

[18] In their words: "For Medicaid, what decisions states will make about Medicaid eligibility and covered benefits over even the next ten years is quite uncertain, and that uncertainty grows with time; accordingly, CBO adopted a formulaic approach to generate the number of Medicaid beneficiaries each year after the next decade. That approach takes into account population growth, increasing earnings (which will reduce the number of eligible beneficiaries), and prospective actions by states. (In particular, the projections incorporate the assumption that states would make changes over time in their Medicaid programs that offset roughly half of the effect of earnings growth on eligibility.) Overall, the number of enrollees is projected to remain roughly the same after 2026."

[19] For their 2016 projections, the authors describe their assumptions for aged Medicaid and Medicaid LTSS receipt at all ages as follows (Truffer, Wolfe and Rennie 2016, page 23): "Aged enrollees are projected to experience the lowest average per enrollee benefit cost growth over the next ten years compared to other enrollee groups, due in large part to projected relatively slower growth in the cost of long-term care services. States are expected to continue to use more home and community-based long-term care to postpone enrollees' need for long-term care facilities as long as possible. In addition, States are projected to shift long-term care expenditures from fee-for-service programs into managed care. As a result, managed care expenditures are expected to grow more quickly and to constitute a larger share of benefits for aged enrollees."

[20] To give a few concrete examples of populous states, Hansen Hunter (2018) reports 2017 Medicaid nursing home daily rates of $210 and $243 for California and New York, respectively. For that same year, Genworth reports daily median prices of $267 and $364 for semi-private rooms in these states.

LTCI--use higher-cost providers.[21] We do not currently apply higher prices for dementia care than standard care.[22] After the last year of historical price data, prices for nursing homes and residential care grow at the same rate as the average national wage, based on the OASDI Trustees' intermediate assumptions, because the provision of LTSS tends to be labor intensive. We assume home care prices grow somewhat more slowly, at the average of wage and price growth, reflecting recent trends in lower-wage workers' compensation and other aspects of the LTSS workforce in private homes.[23] Although our focus in this memorandum is on simulation of the status quo, it bears noting that the price differential between Medicaid and other payers poses challenges when simulating changes to current LTSS financing arrangements.[24]

Because each data source that we use to develop DYNASIM's LTSS capacities has different strengths and weaknesses, we carefully compare projection results with a range of data sources, bearing in mind the advantages and limitations of each source. For example, although we use HRS to project residential care, we calibrate these projections to data from NHATS (Freedman and Spillman 2014b, unpublished tabulations from Spillman), NCHS (for example, Caffrey et al. 2014; Harris-Kojetin et al. 2019), and other sources. Similarly, the HRS self-reports of time in nursing homes do not distinguish between long-term stays for custodial care and short-term stays for strictly post-acute care, so we use NLTCS data matched to administrative records and the MCBS to understand how nursing home care is distributed across these two

[21] We assign these differential rates probabilistically based on income relative to poverty, an effective unit for this purpose, as it accounts for economies of scale for those living with others. Specifically, we assume that a fraction of those with income less than three times poverty who Medicaid does not cover pay 95 percent of their state-specific median rate (rates vary by hours of service used and income range). For those with high income (family income of at least five times the federal poverty level) and who are covered by private long-term care insurance, a select percent pay rates of up to 10 percent higher than their state median. Most people not covered by Medicaid do pay the state-specific market rate. No one pays less than 95 percent or more than 110 percent of the market rate as reported by Genworth.

[22] The 2013 MetLife study reported that about 80 percent of nursing homes providing care for dementia charge the same rate for patients with dementia as for other patients. The average rate for the remaining 20 percent of nursing homes (that charge higher rates for dementia patients) slightly exceeded the national average. Karon et al. (2014) consider how residential care prices vary. They find that facilities with specialized services for people with dementia and that will not discharge patients due to cognitive impairment charge higher rates (average of $1,000 per month in 2010). Also, higher rates are associated with patients needing care with a higher number of ADL limitations. This suggests we should consider modifying these assumptions in the future.

[23] Espinoza (2019), Martin et al. (2009), PHI (2017), and True et al. (2020) describe the direct care workforce. Studies find that the work force providing home care is disproportionately foreign born; some estimate that a substantial share of foreign-born direct care workers are unauthorized. Statistics also reveal that this work force is disproportionately female and less educated, and has disproportionate shares of African Americans and Hispanics relative to the broader work force.

[24] One can imagine that fewer workers would be willing to enter care occupations and that some providers would be unwilling to meet demand if lower prices prevailed for a higher share of patients. As one recent press account describes (Thomas 2015), policies on acute care, post-acute care, and custodial care are likely to interact in important ways.

service types.[25] To improve our projections of private LTCI, we have worked with confidential actuarial data from Milliman as well as published studies by the Society of Actuaries (2011), the National Association of Insurance Commissioners (NAIC 2016, 2017, 2018, 2019), and private industry groups. We look carefully at other prior literature, including those studies that have produced similar long-range projections and studies that focus on historical patterns.

One challenge for dynamic microsimulation is producing aggregate totals and distributional estimates that both align with historical data. This is especially difficult when outcomes are highly skewed, as with earnings and wealth, where the top fraction of 1 percent of the distribution holds an extraordinary share of the total. For modeling LTSS, a large part of the challenge is obtaining aggregate data that provide such detail on the distribution and allow disaggregation of the complex constellation of services that constitutes LTSS (see, for example, Technical Appendix in Bipartisan Policy Center 2014). We address the challenge by combining data from as many sources as possible and earlier in model development relying on a panel of advisors to help assign future parameters that require discretion.

[25] We generally assume, for example, that post-acute services in a skilled nursing facility that occur within weeks of admission to (or discharge from) a nursing home are effectively LTSS, but that short-term post-acute spells when an individual does not meet HIPAA disability standards are not. To compute these levels, we examined several alternative definitions of Medicare-covered services that might reasonably be considered LTSS.

OUTCOME MEASURES

Because DYNASIM ages its population year-by-year, focusing on calendar years, projections can be displayed in various ways. For example, we can examine key outcomes year-by-year, comparing the prevalence of LTSS needs or average costs in 2020, 2030, and 2040, say. Or, we can compare them longitudinally, examining cumulative LTSS experience from age 65 to death).[26] When calculating either type of measure, we generally prorate needs, expenditures, and cost shares in the year of death.[27]

Many of our longitudinal analyses closely mirror those from the earlier study by Kemper et al. (2005/2006), which projected LTSS needs for individuals turning 65 in 2005 (or born in 1940) using another empirically based microsimulation model. We effectively replicate their analyses, but examine a more recent set of birth cohorts: those turning age 65 between 2020 and 2024 (or born between 1955 and 1959). Our results will differ from this previous study because the two models and their underlying data sources differ and because the likely LTSS experiences of the 1940 birth cohort and the 1955-1959 birth cohorts will differ. The later birth cohorts, for example, will live longer and experience more wage and price inflation than the earlier birth cohort.[28]

Our first measures capture the duration of LTSS use and needs, including the average and the distribution. When describing patterns of LTSS need and paid LTSS use, we focus on usage at the level specified in HIPAA: a need for assistance with at least two ADLs[29] that is expected to last at least 90 days or need for substantial supervision for health and safety threats due to severe cognitive impairment (SCI).[30] This measure is highly sensitive to how we classify time needing services. For example, LTSS needs of 100 days in each of three successive years can be classified as either three years of needs or less than one year of need, because 300 service days

[26] We use the terms "longitudinal" and "lifetime" interchangeably for ease of presentation, but recognize that many of our lifetime measures are better classified as old-age measures because we are restricting to service use at ages 65 and older.

[27] More broadly, an individual's health and disability status, and thus program eligibility, may vary over the course of a year. Our disability concepts (ADL and IADL limitations and cognitive impairment) are best interpreted as averages over a year. However, we forecast nursing home use and residential care in days and formal home care use in hours. We adjust service use projections and prorate "years disabled" when people die during the course of a year.

[28] When comparing results for the two studies, we explicitly account for changes in longevity between the birth cohorts (1940 and 1955-1959), particularly for men, as well as other longevity differences in the Social Security Trustees' assumptions (from the mid-2000s to 2019). We weight the life expectancy increase by the share of time after age 65 expected to be disabled--about 25 percent. We gross up the KKA estimates using the resulting product to render them comparable to the DYNASIM estimates. We then make a final adjustment for either wage or price growth, and display these results separately.

[29] The ADLs enumerated in the statute are eating, toileting, transferring, bathing, dressing, and continence.

[30] Estimates of the share meeting HIPAA criteria are sensitive to definition and measurement of disability, including cognitive impairment.

is less than the 365 days that span a year. Because of its relevance to cost projections, we focus on estimating the number of service days, but recognize that understanding the amount of calendar time over which needs endure is also useful, policy-relevant information that can help individuals plan for their future LTSS needs.

For individuals who use nursing homes, we presume a HIPAA-level of need with at least one ADL limitation (rather than two in the community). Some assisted living spells and home care spells occur prior to reaching the HIPAA level.[31] However, we generally report only help and costs that reflect HIPAA levels because of their special policy relevance and because most paid services are provided to older adults with that level of need.[32]

One of our key outcome measures is the present discounted value (PDV) of lifetime LTSS costs after age 65. We examine both this value's mean and its distribution, including how costs are distributed across payers and population subgroups. The PDV can be interpreted as the lump sum that one must set aside at age 65 to finance the expected stream of LTSS payments until death. We compute the PDV using the Social Security Trustees' ultimate real interest rate of 2.5 percent. Because the trustees assume long-range price growth to average 2.6 percent, this amounts to a nominal discount rate of about 5.1 percent in the long-run. We present all lifetime cost projections in constant 2020 dollars.[33] We typically round dollar amounts to the nearest $10 or $100 depending on the statistic, reflecting the inherent uncertainty surrounding our projections.

We also examine the expected sum of LTSS payments, again using inflation-adjusted 2020 dollars. Unlike the PDV, this quantity does not account for the additional interest that LTSS payments made relatively early in life could have earned relative to later payments. It may, however, be a more intuitive measure for some readers.

Allocating LTSS costs to payers requires that we make several assumptions. We focus on point-of-service LTSS costs in these assignments. From one perspective, this approach leads us to understate family out-of-pocket costs for LTSS; after all, everyone who ever pays personal income tax to federal or state governments in essence contributes to Medicaid LTSS, but we ignore these contributions to be consistent with the prior literature.[34]

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[31] See, for example, our earlier discussion of Stallard (2011). Murtaugh and Spillman (2012) estimate average disability durations of 2.4 years pre-HIPAA eligibility and 1.7 years at the HIPAA level.

[32] MACPAC (2016) describe the tools that the states use for determine eligibility under Medicaid programs. Cohen, Gordon, and Miller (2011) describe how private insurance companies implement benefit triggers.

[33] We base these conversions on the intermediate assumptions of the 2019 Trustees assumptions. Actual 2020 experience is likely to differ due to the COVID-19 pandemic's effects on the economy.

[34] We have produced DYNASIM calculations that reflect such contributions elsewhere. For example, we have examined the relationship between Social Security taxes (both payroll taxes and personal income taxes paid on benefits) and Social Security benefits. Similarly, we have compared Medicare benefits to Medicare payroll taxes, premiums, contributions to the Medicare Trust Fund from taxation of Social Security benefits, and surtaxes on higher-income beneficiaries. (See, for example, Favreault 2019). We could thus readily construct analogous measures if requested.

We consider cost shares for Medicaid, which we compute by following program eligibility rules, as out-of-pocket expenses (for discussion of Medicaid cost shares, see for example chapter 2 in O'Keeffe et al. 2010). When individuals receive reduced SSI benefits because they are residing in an institution that Medicaid pays for, we assume that the reduction in SSI is not an out-of-pocket expense per se, consistent with the law that the their full benefit is not payable (see for example Program Operations Manual System, Section 00520.011, Social Security Act, Section 1611(e)(1)(B); 20 Code of Federal Regulations 416.212, 416.414).[35] We produce detailed projections of Medicare cost shares including premiums and out-of-pocket payments for both LTSS and non-LTSS service using MCBS data, but include here only explicit LTSS cost shares (for example, days 21-100 in a skilled nursing facility, which require a daily copayment of $176 in 2020), not premiums or the payroll taxes individuals paid earlier in life to finance this coverage. In allocating costs to Medicare, we compute program eligibility and then assign LTSS spells based on their duration (i.e., shorter spells are more likely to be classified as Medicare spells than longer ones).[36] Similarly, we do not include private LTCI premiums, either for those who eventually go on claim or those who do not, to the family contributions at ages 65 and older again to stay consistent with a focus on out-of-pocket at the point of service, rather than total costs. We follow private plan rules carefully to be sure that elimination periods have been fulfilled, that program maxima are not exceeded, and so forth when paying benefits to those who claim them.[37] For other public expenditures, we use a simple regression for those receiving institutional care from the U.S. Department Veterans Affairs, disproportionately men, based on MCBS data. We assign participation in programs, most notably personal care services, authorized under the Older Americans Act based on intensity of home care (Administration for Community Living 2013).

Our final tables provide total LTSS costs over time. We express these costs as a percentage of gross domestic product (GDP) to facilitate comparison with government forecasts for other programs like Social Security and Medicare (see, for example, Board of Trustees, Federal Old-Age and Survivors Insurance and Disability Insurance Trust Funds 2019; CBO 2019).

[35] If we assume that SSI payments are out-of-pocket, then total expenditures are not consistent with the total by payer (i.e., there is no transfer from SSI/Social Security to state or federal Medicaid program).

[36] Friedberg et al. (2014) provide useful discussion of Medicare's role in LTSS. See also Jacobson, Neuman, and Damico (2010) and Tumlinson (2015).

[37] We make the conservative assumption that those with coverage whose disabilities reach qualifying levels collect benefits as soon as possible. This assumption is somewhat inconsistent with some experience studies that report a small share of eligible prospective claimants delay collecting benefits after notifying their insurance company that they are disabled (Miller, Shi and Cohen 2008).

POPULATION AND CLASSIFICATION VARIABLES

In many of these tables, we focus on individuals turning age 65 between 2020 and 2024.[38] We focus on the population age 65 and older due in part to limitations in the HRS data.[39] In future work, we hope to extend the LTSS components of the model to include the population younger than 65, perhaps in stages (51-64 and then those less than age 51).

We cross-tabulate outcomes by several important characteristics including gender, health and marital status at age 65, non-housing wealth quintile at age 65, and household size-adjusted income quintile at age 65.[40] DYNASIM's income projections include earnings, pensions, Social Security, SSI, and asset income (defined as the annuitized value of financial assets using a multivariate annuity function) for both oneself and, if married, one's spouse.

[38] For these longitudinal analyses, we need to observe cohorts through the age at which an overwhelming share of them have died. Also, we want to focus on people who have entered the workforce and have some observed history. We thus typically limit our longitudinal analyses to individuals born though 1980.

[39] Although the survey includes people ages 51 and older, LTSS prevalence is much low prior to age 65 and usage patterns differ, making it challenging to model LTSS use by younger people reliably. Also, HRS does not measure cognitive status comprehensively until age 65.

[40] We divide income by the poverty threshold to adjust for family size; this adjustment recognizes that two or more people can live together more cheaply than they could if each maintained a separate household. We have produced alternative metrics, like per capita income (which does not adjust for family size). We use quintiles that are defined based on the population ages 65 and older.

RESULTS

Long-Term Services and Supports Needs

Figure 3 presents our projections of the number of people age 65 and older, including the number meeting HIPAA disability criteria from 2020 to 2065. As expected given the aging population, the number of aged people with HIPAA-level disability is expected to grow from 7.2 million to almost 14.3 million. The growth rate for the population with HIPAA-level needs is projected to be faster than that for the rest of the aged population.

Our first table describes how HIPAA-level disability plays out over a lifetime, displaying expected LTSS needs from age 65 to death (Table 1). It presents life expectancy and then the mean and distribution of the duration of HIPAA-level LTSS needs for those turning 65 in 2020-2024. We see that the typical person in this cohort who is alive at age 65 can anticipate to live another 20.5 years. Women can expect to live substantially longer than men (21.7 years compared to 19.1 years), and those reporting better health and more income at age 65 can expect to live longer than those reporting worse health (22.3 years for excellent health, compared to 18.6 years for poor health) and with less income (23.1 years in the highest income quintile, compared with 17.7 years in the lowest quintile).[41] The average duration of HIPAA-level LTSS needs is similarly much higher for women than for men--about 3.2 years for all women and 2.3 year for all men, with a weighted average of 2.8 years--and for those with better health and more income.

The figures for average LTSS needs mask substantial variation. A large share of the cohort will have no HIPAA-level needs (44 percent). A majority (56 percent) can anticipate having at least some needs, with just about 10 percent expected to have needs that last less than a year, and almost 22 percent expected to have needs that extend over at least five years. Among women, the share ever needing HIPAA-level care jumps to 61 percent and the share needing at least five years of care is almost 26 percent. Similarly, shares needing at least five years of care are higher among those in the lowest income quintile at age 65, 28 percent of whom can expect to need care for at least five years, and those reporting poor health at age 65, 23 percent of whom can expect to need care for at least five years. When we look at just LTSS users (i.e., we exclude the 44 percent who are never disabled or whose needs fall below the HIPAA threshold), the average duration of HIPAA-level need jumps to 5.3 for women and 4.6 for men, respectively, and to 5.0 years for the overall population.

Figure 4 likewise describes how this HIPAA need extends through a lifetime in our projections, and contrasts the DYNASIM estimates with those from Stallard (2011), both before and after we adjust for the different time period and thus life expectancy. One prominent feature of the figure is the marked increase in life expectancy across the two studies. This is not

[41] It is important to bear in mind that important differences in life expectancy exist prior to age 65 as well.

surprising given that the DYNASIM analyses are considering later cohorts. The life expectancy gain is especially large for men, who gain an average of 3.8 years, compared to 2.3 years for women. This difference is in keeping with changes to the OASDI Trustees assumptions, which in turn reflect observed changes in longevity. The DYNASIM projections also suggest that for cohorts reaching retirement over the next five years, extra life expectancy relative to these earlier cohorts will disproportionately be spent mildly disabled (defined here as including IADL disability and ADL disability that one classifies oneself as having difficulty with rather than the higher threshold of disability one reports needing help with). This may in part stem from the fact that life expectancy is being added at rather advanced ages for many. This finding is consistent with a recent study by Gaudette et al. (2015), but is worthy of additional sensitivity analysis.

Formal (Paid) Long-Term Services and Supports Use

Before moving on to the lifetime estimates, Figure 5 first displays annual counts of individuals ages 65 and older who are projected to use formal, paid services (excluding strictly post-acute services) at any point in the year during each year from 2020 through 2065. The figure displays separate series for all service users and then those service users who meet the HIPAA-level disability criteria. The total number of service users is expected to grow from 7.4 million in 2020 to 14.4 million in 2065. HIPAA-level users are expected to grow from 5.5 million to 11.1 million over the same period.

Figures 6A-6B displays these same outcomes a single point in time, 2020, showing how paid service use varies with age by service type (nursing home, residential care, and formal home care) for those ages 65 and older. The figure shows the marked age gradient associated with LTSS use (Figure 6A), for all three service types that year. We forecast about 1.4 million people ever (that is, at any point during the calendar year) receiving residential care, 2.9 million ever in a nursing home, and 3.9 million ever receiving formal home care due for ADL-related needs (as distinct from home health care). When we restrict the sample to those disabled at the HIPAA level (Figure 6B), the pattern is the same but the levels are lower: about 71 percent the level for residential care, 76 percent the level for home care, and 81 percent for nursing home care--though most nursing home residents have disabilities so close to the HIPAA threshold that we assume they are equivalent elsewhere. As with Figure 5, these projections include any individuals who use formal services over the course of year, and are thus substantially higher than estimates from alternative sources that report usage for a particular day or week in the given year.

An important aspect of these projections is that the total number of LTSS users does not equal the total of users of each type. A substantial share of individuals will use more than one service type over the course of a year. Generally, this occurs because people receive care in

different settings sequentially (for example, they transition from receiving paid care at home to living in a residential care setting or a nursing home) rather than simultaneously.[42]

Table 2 examines use of LTSS provided by paid helpers for HIPAA-level needs from age 65 onward. Expected duration drops to about 1.1 years (from the 2.8 year average HIPAA-level need estimate), reflecting the fact that informal providers, very often family caregivers, will meet even high-intensity LTSS needs for a substantial share of this cohort.[43] Again, patterns vary by a range of characteristics. For example, women use more formal care than men, 1.3 years compared to 0.9 years. Also, people who are unmarried at age 65 use more formal services than those who are married at age 65, an average of 1.3 years compared to 1.0 years. Patterns by health status and income at age 65 mirror those for LTSS needs, with use lower for healthier and higher-income people relative to their less healthy, lower-income counterparts.

Long-Term Services and Supports Costs by Setting and Payer

Tables 3A-3I presents the projected PDV of mean cumulative (age 65 plus) costs by gender, setting, and payer for those reaching age 65 over the next five years. Tables 3A-3I combines care that is received at home and that which is received in residential care into a single category of "community care," which is contrasted with institutional care. This is our preferred presentation approach, given measurement difficulties for residential care in HRS.[44] Once more we focus on the HIPAA level, with a few exceptions (nursing home care costs are counted regardless of disability status, residential care is included only if an individual reports difficulty with at least two ADLs or is severely cognitively impaired, home care costs are only included for those meeting HIPAA criteria). On average, individuals can expect to spend about $80,200 for LTSS. Women's costs average $97,300 compared to $61,900 for men. However, when we focus on those with any expenditures, this average jumps to $175,500 for women and $142,200 for men.

[42] Chance et al. (2009), for example, describe the prevalence of changes in settings for an insured population, and note variation in transfer rates by initial service setting, insurance plan features like the benefit period, and demographic characteristics like marital status.

[43] Use of unpaid services is substantial at both the HIPAA and non-HIPAA levels, while use of formal services is more concentrated at the HIPAA-level.

[44] A National Center for Health Statistics study (Harris-Kojetin et al. 2013) used the following four criteria for a residential care community: (1) Licensed, registered, certified, and otherwise regulated by the state to provide room and board with at least two meals per day and around-the-clock on-site supervision and help with personal care such as bathing and dressing or health-related services, such as medication management; (2) at least four licensed, certified, or registered beds; (3) at least one resident living in the community; and (4) serve a predominantly adult population. To proxy for this type of facility using HRS data, we require a self-report that one's (house or apartment) is part of a retirement community, senior citizens' housing, or some other type of housing that offers services for older or disabled adults and one reports access to at least two of the following services: group meals, transportation services, housekeeping chores, help with bathing, dressing, or eating, and nursing care or an on-site nurse. We classified individuals as receiving residential care even if the respondent reported not currently using the services.

Looking at community and institutional expenses together, Medicaid and out-of-pocket payments are the two predominant payers, comprising 39 and 57 percent of the PDV of total LTSS expenditures, respectively, for overall spending by men and women combined. Smaller shares are covered by private insurance and other public programs. Payer predominance varies by setting. For example, Medicaid pays for over 49 percent of the total for institutional settings. For community expenses, in contrast, out-of-pocket payments by families comprise the majority, about 70 percent, with private insurance paying for about 4 percent. Overall, this estimate is consistent with a recent study by Janus and Ermisch (2015) from an earlier period (1989-2004 waves of the NLTCS), which suggests that about two-thirds of paid home care is paid out-of-pocket. O'Brien (2005) reports earlier estimates from that from age 65 onward, about 44 percent of people with any nursing home care paid their own way--similar to our projection. Importantly, we should recall that the experiences reflected here are mostly in the future; we expect out-of-pocket spending to compose a larger share of LTSS 20 years from now than it does today. Men and women rely on a different mix of payers for services, with women relying more heavily on public programs than men, whose expenses are proportionately likely to be paid out-of-pocket. This is not surprising given women's lower incomes, higher life expectancies, and higher disability rates.

Because LTSS expenses are so difficult to measure, it useful to determine how these projections compare to others from the literature. Tables 4A-4B thus shows how these estimates relate to the earlier analyses from Kemper et al. (2005/2006). We specifically display the ratio of the DYNASIM spending projection to the Kemper et al. (2005/2006) value. A value of 1 indicates that DYNASIM project the same level of spending as Kemper et al. (2005/2006), values of greater than one indicate DYNASIM projects higher expenses than Kemper et al. (2005/2006), and values less than one indicate that DYNASIM projections are lower. When making these comparisons, we adjust for increase in life expectancy and inflation from the Kemper et al. (2005/2006) cohorts, which reached age 65 in 2005, and our cohorts (those reaching age 65 from 2020 to 2024). Because future growth rates for LTSS are uncertain, we juxtapose comparisons that use two alternative inflation adjustments: one that assumes that LTSS costs will grow with wage inflation and a second that assumes they will grow more slowly, with price inflation.[45]

The DYNASIM projections for PDV of longitudinal LTSS fall are higher than both the wage and price indexed values from Kemper et al. (2005/2006) (Table 4A). After we exclude Medicaid from both sets of projections, the DYNASIM projections are about 144 percent of the Kemper et al. (2005/2006) projections when we price index LTSS costs and 139 percent of the Kemper et al. (2005/2006) projections when we wage index them. DYNASIM projects marked shifting from institutional to HCBS care relative to Kemper et al. (2005/2006). DYNASIM projects that roughly 57.5 percent of the total LTSS expenses will be institutional, with 42.4 percent HCBS (compared

[45] There are many other differences in assumptions between the DYNASIM and KKA projections. For example, KKA uses a discount rate of 3.0 percent real, compared to our 2.5 percent real discount rate. We adjust for two major sources of difference, inflation and life expectancy; unfortunately, adjusting for every possible difference is beyond the scope of this memorandum.

to 64 and 36 percent for Kemper et al. [2005/2006]), representing a sizable shift. Considering payers, DYNASIM projects higher shares of LTSS costs paid for by families out-of-pocket and Medicaid. According to DYNASIM, private LTCI will play an increased role, but nonetheless still represent only a modest share of expenditures (2.9 percent Kemper et al. [2005/2006] after excluding Medicare and 3.0 percent in DYNASIM)--and these expenditures are highly concentrated among individuals at the top of the income distribution.

Table 4B disentangles the two sources of community care--residential care and home-based care--for those wishing to understand the mix. We use means and, again, ratios when comparing directly to Kemper et al. (2005/2006). We find that although Kemper et al. (2005/2006) projected a nearly even split between home care and residential care, DYNASIM projects comparatively more home care in dollar terms.[46]

Tables 5A-5C presents the distribution associated with the Tables 3A-3I average PDV for those ages 65 and older in 2020-2024. About 14 percent of women and nearly 9 percent of men can expect their LTSS expenses from age 65 onward to amount to more than $250,000, while about equal shares of men and women--approximately 8 percent--will have positive but low costs (<$10,000). Women are more highly represented than men in all the higher spending categories. We also again see important differences in payer mix for men and women.

Because of their importance as payers for LTSS, we provide a disaggregated table of DYNASIM longitudinal Medicaid (Table 6A) and family out-of-pocket expenses (Table 6B) for those turning 65 in 2020-2024. We specifically show both the mean PDV and the distribution of the PDV by income quintile at age 65. This allows us to address the hypothesis that higher-income families frequently benefit from Medicaid LTSS programs (Warshawsky [2014]; for empirical investigations of this hypothesis and related issues, see, for example, Baird, Hurd, and Rohwedder [2014]; Bassett [2004]; Borella, De Nardi, and French [2017]; Lee, Kim, and Tanenbaum [2006]; Liu and Waidmann [2005]; Wiener et al. [2013]; and Willink et al. [2019]). The DYNASIM projections suggest that although Medicaid does reach individuals at all points in the income distribution at age 65, it primarily serves those in the bottom two quintiles. For example, about 40 percent of people in the bottom income quintile at age 65 use Medicaid LTSS, compared to just 7 percent in the top quintile at that age. Those in upper income quintiles who use Medicaid are typically individuals who have survived until their mid-90s, consistent with other research (DeNardi, French and Jones 2013).

Family out-of-pocket expenditures, in contrast, are more concentrated in the higher quintiles. The average out-of-pocket LTSS expense in the top quintile is approximately $66,000 compared to closer to $23,000 in the bottom quintile. But again the mean obscures important distributional information. Nearly 10 percent of people in the top income quintile at age 65 can expect out-of-pocket expenses exceeding a quarter million dollars.

[46] Note that as a default, DYNASIM does not adjust the residential care costs to account for ordinary living expenses (e.g., room and board). We do present alternative treatments of room and board in this report.

Many individuals and families who receive Medicaid LTSS also spend substantially out-of-pocket. A primer by the U.S. Department of Health and Human Services (O'Keeffe et al. 2010) provides a detailed overview of eligibility criteria for LTSS from Medicaid, and describes hypothetical spenddown situations. Table 6C explores the interaction of Medicaid and out-of-pocket spending, examining just those ages 65 and older in 2020-2024 who used at least some LTSS. The table suggests that those who rely on Medicaid for at least some portion of their time using LTSS have quite similar out-of-pocket expenses to those who never use Medicaid. They are also about as likely to have very large out-of-pocket expenses. This finding is broadly consistent with Kemper et al.'s (2005/2006) findings (see their Table 5).

Table 7 combines information from Table 2 on the duration of LTSS use at HIPAA levels with the information from the subsequent tables on costs and payers to arrive at shares of overall LTSS expenses that accrue to individuals ages 65 and older with different durations of LTSS use. It reveals that individuals with long spells using LTSS, though a minority of the overall population, account for over two-fifths of LTSS costs. Those with spells of less than a year of LTSS use are nearly a fifth (19.7 percent in Table 2) of those who survive to age 65, they account for only 8 percent of LTSS costs. Table 7 also reports how these shares vary by payer. Bear in mind that we are describing here the length of the ***total*** disability spell, ***not*** the length of the spell for a given payer in each row. DYNASIM projects that Medicaid payments are more concentrated among those with long disability spells. Almost 60 percent flow to those whose disability use lasts at least five years. Out-of-pocket costs are less skewed toward long spells.

Tables 8A-8F presents the sum of LTSS expenditures rather than the PDV. We see the same general patterns as were present in Tables 3A-3I, but much higher expenditure levels--not quite double those for the PDV. Women, for example, can expect to spend $171,000 on LTSS, compared to $102,500 for men. When we examine the sum's distribution (Tables 9A-9C), patterns mirror those for the PDV, though with much higher shares in the high expenditure groups. One modest substantive difference is that those settings that tend to occur later in life (nursing homes) comprise a somewhat larger percentage of LTSS expenditures with the sum than with the PDV.

Value of Informal (Unpaid) Care

The value of the direct, unpaid care that families provide to older adults with severe disabilities (meeting at least the HIPAA threshold) is roughly comparable to the value of paid care (Table 10A). Our preliminary estimates suggest that the PDV of care averages about $77,500 across the broader population in present value terms (2020 dollars), compared to $80,000 for paid care. This estimate is surely on the low end, as other work reveals that families deliver large amounts of unpaid care to people with less severe disabilities (Favreault forthcoming). When we restrict to those ever receiving unpaid care, the average is nearly $131,000 when expressed as a present value. The sums are markedly higher than the PDVs.

As with formal care, the distributional of unpaid care is also skewed (Table 10B). About 13 percent of the population receives family care in present value terms that would have market value of $250,000 or more.

Total Costs for Paid Long-Term Services and Supports

When we aggregate the annual projections and apply population weights, we can obtain projected aggregate expenditures for aged HIPAA-level paid LTSS for the country for each projection year (Figure 7A). We see that projected expenditure growth is expected to track aged population growth, and particularly growth in the population of the oldest old, when disability prevalence and service use are relatively high. Figure 7B displays the same information, but reveals how the Medicaid portion is split between the state and federal governments, with the Federal Government bearing a somewhat higher share than the states in some states.[47] Figure 7C includes non-HIPAA LTSS. To place these estimates in context of other estimates of LTSS expenditures as a percent of the economy, CBO's 2012 estimate for LTSS expenses at ages 65 and older equals 1.2 percent of GDP when including all Medicare post-acute payments, and 0.8 percent of GDP when excluding Medicare expenditures (as in our current analyses). This compares reasonably to our projections that include HIPAA and non-HIPAA expenses (in Figure 7C), where 2020 expenditures amount to an estimated 1.0 percent of GDP. Further validation and calibration to aggregate expenditures is nonetheless warranted and a high priority for the project.

To put this pattern for aged LTSS in the context of other fiscal pressures associated with an aging population that the United States will face in coming decades, Figure 8 depicts CBO projections of Social Security and Medicare expenditures net of offsetting receipts[48] through 2049. Assuming an extended baseline, CBO projects Social Security costs to rise from 5.0 to 6.2 percent of GDP, an increase of 1.2 percentage points over this shorter interval, and net Medicare costs to rise from 2.4 to 4.6 percent of GDP, an increase of 2.6 percentage points. We thus see that projected LTSS cost growth falls between Medicare and Social Security costs growth but is more akin in percentage terms to projected Medicare cost, though its growth is smaller as a share of the economy.

[47] The HHS website provides Federal Medical Assistance Percentages (FMAP): http://aspe.hhs.gov/health/fmap.cfm.

[48] These include payments such as beneficiary premiums.

REASONS FOR DIFFERENCES FROM OTHER ANALYSES

Another potential source of confusion is that the composition of LTSS costs by payer looks different in these analyses than in analyses that rely strictly on National Health Expenditure Accounts (NHEA) data. Important amounts of LTSS, both at home and in assisted living facilities, are provided through private transactions that the NHEA does not cover (Hartman, Kornfeld and Catlin 2010; Newquist, DeLiema and Wilber 2015).[49] One recent survey of home care firms finds that nearly three-quarters of services were used by families paying out-of-pocket (Homecare Pulse 2019), and a study of nationally representative data from an earlier period put this at closer to two-thirds (Janus and Ermisch 2015). Moreover, the home care sector is growing and changing rapidly (Doty 2017).

Figure 9 illustrates how various analytic choices, like whether to include Medicare and room and board costs in residential care facilities as components of LTSS and the age range one uses, affect the composition of LTSS spending. It contrasts the DYNASIM projections for a point in time--2017, not the present value projections--with historic, NHEA-based estimates from Colello (2020), Hado and Komisar (2019), and Hagen (2013). Box 1 discusses some of the tradeoffs between including and excluding Medicare-covered services.

The figure illustrates that many differences across the reports are due to differences in the sample population or the LTSS concept that analysts have used, with the choice of age range and whether to include: (1) Medicare spending for certain services; (2) private pay, non-agency transactions; and (3) the room and board component of residential care all prominent choices. The more similar the comparison across groups, the more similar the estimates of the composition of spending.

For example, when we exclude Medicare from Colello's and Hagen's estimates and exclude both Medicare and the cost of room and board in residential care from the DYNASIM estimates, the proportion of total spending by Medicaid is much more similar across studies: 55 percent for Colello (2020) and 57 percent for Hado and Komisar (2019), both of which include people of all ages, and 48.8 percent for Hagen (2013) and 51.0 percent for DYNASIM, both of which focus on adults ages 65 and older. It is not surprising that Medicaid's role is estimated to be larger for the full population than for the aged population, as those with early-onset disabilities are well known to have lower incomes and assets than those whose disabilities onset late in life.

[49] The NHEA includes Medicaid services delivered in residential care facilities, but may exclude analogous private pay services (Hartman, Kornfeld and Catlin 2010).

CAVEATS AND COMPARABILITY NOTES

We have combined data from a wide array of data sources to project our best guess of LTSS needs and use in coming decades. This representation is nonetheless quite stylized. Data on LTSS financing are quite limited in many respects, especially for analysts wishing to examine outcomes longitudinally. Standard measurement challenges for survey research are amplified in a dynamic microsimulation context, in which multiple data sources are being combined through the starting samples, aging parameters, and alignment.

Readers should be cognizant of the challenges inherent in measuring concepts like LTSS need. Modest differences in question wording or measurement of function can lead to markedly different estimates of disability prevalence. As a consequence, we strongly advise against focusing solely on any single cross-sectional or lifetime estimate of disability or LTSS needs. Nuance is essential for understanding disability patterns given the measurement challenges. Similarly, it is important to bear in mind that the line between services that are post-acute and LTSS may be ambiguous. Even our rule-based assignments for public program like Medicaid need to include eligibility algorithms, and we must develop these based on findings from an unresolved literature.

When comparing DYNASIM projections to other data sources, it is important to distinguish measures that reflect service at any time during the year from measures that look at a single point in time (e.g., a survey date). For example, calculations from the NLTCS 2004 survey data linked to the long-term care Minimum Data Set suggest that roughly twice as many people will spend time in a nursing home over the course of a year than are observed in a nursing home at a single point in time, an estimate that increases to 2.8 times as many if stays in skilled nursing facilities are included.[50] Likewise, given the role institutional settings play in providing LTSS, any estimates that reflect the disability characteristics of the non-institutional population will differ substantially from our projections, which attempt to replicate the total population.

A final caveat is that projecting lifetime outcomes for several decades is inherently challenging and uncertain. Our model contains many underlying assumptions about processes for which leading experts are sharply divided, including disability, mortality, relative attractiveness and availability of LTSS service types, the future of the private LTCI market, and growth in costs for health services more broadly. We have drawn heavily from the assumptions of lead government forecasting groups and relied on expert reviewers and advisors, but will continue to review assumptions as new data and research become available. As this occurs, we will update these projections to insure their validity.

[50] Similarly, Hurd, Michaud, and Rohwedder (2013) report a difference of about three times as many people receiving nursing home care over a two-year period than at a point in time.

Readers should be aware that these results represent a preliminary attempt to advise policymakers and the public about the risk of needing LTSS. As discussions of financing policies for LTSS evolve, it will be important to check the robustness of these and other estimates. Administrative data that we did not have access to for this study could prove particularly helpful given limitations in the public-use data on which our model overwhelmingly relies.

CONCLUSION

Our projections reinforce many messages from the prior literature. Many Americans who survive to age 65 can expect to need and use LTSS. The average projected duration of LTSS needs is about 2.8 years, about 5.0 years for those who have needs (conditional mean). Those on the upper tail of the need distribution can expect it to persist for many years and expect care costs that can total hundreds of thousands of dollars. Such long-term cases comprise a very important share of total LTSS spending. Medicaid is an important payer for LTSS, but because it serves only those who have become impoverished, many aged families need to pay for LTSS out-of-pocket. Private LTCI has only a modest reach, and it predominantly covers costs for those high in the income distribution. Similarly, other public expenditures (for example including U.S. Department of Veterans Affairs care) help to cover small shares of the population with LTSS needs.

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TABLES, FIGURES, AND BOXES

TABLE 1. Projected Need for LTSS for Persons Turning 65 in 2020-2024, by Gender, Income Quintile, Marital Status, and Self-Reported Health Status at Age 65

	Remaining Life Expectancy at Age 65 (All)	HIPAA-Level LTSS Need							
		Average Years (ALL)	Average Years Given Any Need	Percent with Any	Distribution for All, in Years				
					None	<1	1-1.99	2-4.99	>=5
Total	20.5	2.8	5.0	56.2	43.8	10.3	8.7	15.2	21.9
Gender									
Men	19.1	2.3	4.6	50.9	49.1	9.9	8.7	14.2	18.0
Women	21.7	3.2	5.3	61.1	38.9	10.7	8.7	16.2	25.6
Income quintile at age 65									
Lowest	17.7	3.4	5.6	61.6	38.4	10.7	8.5	14.2	28.3
Second	19.3	3.0	5.2	57.3	42.7	9.5	9.8	14.9	23.1
Middle	20.2	2.8	4.9	55.8	44.2	11.4	9.1	14.3	21.0
Fourth	21.0	2.5	4.7	53.1	46.9	10.2	8.3	15.4	19.2
Highest	23.1	2.5	4.6	54.1	45.9	10.0	8.1	16.8	19.3
Health status at age 65									
Excellent	22.3	2.6	4.8	55.4	44.7	10.3	8.8	15.2	21.0
Very good	21.6	2.7	5.0	53.9	46.1	10.3	8.5	13.8	21.4
Good	20.1	2.8	5.1	55.1	44.9	9.6	8.5	15.4	21.6
Fair/poor	18.6	3.0	5.0	60.5	39.5	11.3	9.1	16.8	23.3
Marital status at age 65									
Married	21.5	2.6	4.7	55.2	44.8	10.7	8.9	15.7	20.0
Unmarried	19.8	3.2	5.4	59.0	41.0	9.8	8.7	15.1	25.4

SOURCE: Authors' tabulations from DYNASIM4, run id974.
NOTES: "HIPAA level" is defined as needing assistance with at least two activities of daily living or supervision due to severe cognitive impairment that is expected to last at least 90 days.

TABLE 2. Projected Use for LTSS at HIPAA Level Using Service Time for Persons Turning 65 in 2020-2024, by Gender, Income Quintile, Self-Reported Health Status at Age 65, and Marital Status at Age 65

	Formal LTSS Use							
	Average Years (best guess)	Average Years (higher bound)	Percent with Any (All)	Distribution (best guess) for All, in Years				
				None	<1	1-1.99	2-4.99	>=5
Total	1.1	1.2	47.3	52.7	19.7	8.3	12.4	6.8
Gender								
Men	0.9	0.9	41.4	58.6	18.4	7.9	10.3	4.9
Women	1.3	1.4	52.8	47.2	20.9	8.8	14.5	8.7
Income quintile at age 65								
Lowest	1.4	1.5	50.1	49.9	17.5	8.7	14.6	9.3
Second	1.2	1.3	48.3	51.7	20.1	7.3	12.7	8.2
Middle	1.1	1.1	45.1	54.9	19.1	7.5	11.5	7.0
Fourth	0.9	1.0	45.3	54.7	20.3	8.5	11.3	5.2
Highest	1.0	1.0	47.7	52.3	20.9	9.4	12.2	5.2
Health status at age 65								
Excellent	1.1	1.2	46.0	54.0	19.4	7.7	12.6	6.3
Very good	1.1	1.1	46.5	53.5	19.7	8.3	12.1	6.5
Good	1.1	1.1	46.3	53.7	19.4	8.0	12.2	6.8
Fair/poor	1.2	1.3	50.1	49.9	20.3	9.1	13.1	7.7
Marital status at age 65								
Married	1.0	1.0	45.7	54.3	20.0	8.2	12.0	5.6
Unmarried	1.3	1.4	51.1	48.9	19.9	8.9	13.5	8.9

SOURCE: Authors' tabulations from DYNASIM4, run id974.

NOTES: "HIPAA level" is defined as needing assistance with at least two activities of daily living or supervision due to severe cognitive impairment that is expected to last at least 90 days. DYNASIM projects home care in annual hours, rather than service days/visits. Best guess estimate transforms annual hours by assuming at least 4 hours of home care per service day; higher bound estimate assumes minimum of 2 hours per service day.

TABLE 3A. Average Present Discounted Value (2020 dollars) of Expenditures from Age 65 through Death Projected for People Turning 65 in 2020-2024: Men

Payer	Total Expenditures		Community-Based (includes residential care)		Nursing Facility	
	Dollars	Percentage	Dollars	Percentage	Dollars	Percentage
Public	$25,600	41.4%	$6,700	23.6%	$18,830	56.0%
Medicaid	23,900	38.6%	6,500	22.9%	17,330	51.6%
Other Public	1,700	2.7%	200	0.7%	1,500	4.5%
Private	$36,300	58.6%	$21,700	76.4%	$14,800	44.0%
OOP	34,500	55.7%	20,300	71.5%	14,400	42.9%
Private Insurance	1,800	2.9%	1,400	4.9%	400	1.2%
Total	$61,900	100.0%	$28,400	100.0%	$33,600	100.0%

SOURCES: Authors' tabulations from DYNASIM4, run id974.

NOTES: We use a real discount rate of 2.5% (5.1% nominal) in these calculations. Residential care is included in community-based, not nursing facilities. LTSS prices are state and setting-specific, based on Hansen Hunter (2018), Genworth (2019), and other sources. Nursing home, home care, and residential care prices are adjusted for wage inflation.

TABLE 3B. Average Present Discounted Value (2020 dollars) of Expenditures from Age 65 through Death Projected for People Turning 65 in 2020-2024: Women						
Payer	**Total Expenditures**		**Community-Based (includes residential care)**		**Nursing Facility**	
	Dollars	**Percentage**	**Dollars**	**Percentage**	**Dollars**	**Percentage**
Public	$38,600	39.7%	$10,300	26.3%	$28,400	49.0%
Medicaid	37,500	38.5%	10,000	25.5%	27,600	47.6%
Other Public	1,100	1.1%	300	0.8%	800	1.4%
Private	$58,700	60.3%	$28,900	73.7%	$29,600	51.0%
OOP	55,600	57.1%	27,300	69.6%	28,100	48.4%
Private Insurance	3,100	3.2%	1,600	4.1%	1,500	2.6%
Total	$97,300	100.0%	$39,200	100.0%	$58,000	100.0%

SOURCES: Authors' tabulations from DYNASIM4, run id974.
NOTES: We use a real discount rate of 2.5% (5.1% nominal) in these calculations. Residential care is included in community-based, not nursing facilities. LTSS prices are state and setting-specific, based on Hansen Hunter (2018), Genworth (2019), and other sources. Nursing home, home care, and residential care prices are adjusted for wage inflation.

TABLE 3C. Average Present Discounted Value (2020 dollars) of Expenditures from Age 65 through Death Projected for People Turning 65 in 2020-2024: Combined Men and Women						
Payer	**Total Expenditures**		**Community-Based (includes residential care)**		**Nursing Facility**	
	Dollars	**Percentage**	**Dollars**	**Percentage**	**Dollars**	**Percentage**
Public	$32,300	40%	$8,600	25%	$23,700	51%
Medicaid	30,900	39%	8,300	24%	22,600	49%
Other Public	1,400	2%	300	1%	1,100	2%
Private	$47,900	60%	$25,400	75%	$22,400	49%
OOP	45,400	57%	23,900	70%	21,400	46%
Private Insurance	2,500	3%	1,500	4%	1,000	2%
Total	$80,200	100%	$34,000	100%	$46,100	100%

SOURCES: Authors' tabulations from DYNASIM4, run id974.
NOTES: We use a real discount rate of 2.5% (5.1% nominal) in these calculations. Residential care is included in community-based, not nursing facilities. LTSS prices are state and setting-specific, based on Hansen Hunter (2018), Genworth (2019), and other sources. Nursing home, home care, and residential care prices are adjusted for wage inflation.

TABLE 3D. Average Present Discounted Value (2020 dollars) of Expenditures from Age 65 through Death Projected for People Turning 65 in 2020-2024: Men with HIPAA-Level LTSS Use						
Payer	**Total Expenditures**		**Community-Based (includes residential care)**		**Nursing Facility**	
	Dollars	**Percentage**	**Dollars**	**Percentage**	**Dollars**	**Percentage**
Public	$57,900	40.7%	$14,800	22.6%	$43,100	56.1%
Medicaid	54,000	38.0%	14,300	21.9%	39,700	51.7%
Other Public	3,900	2.7%	500	0.8%	3,400	4.4%
Private	$84,300	59.3%	$50,600	77.4%	$33,700	43.9%
OOP	80,300	56.5%	47,500	72.6%	32,800	42.7%
Private Insurance	4,000	2.8%	3,100	4.7%	900	1.2%
Total	$142,200	100.0%	$65,400	100.0%	$76,800	100.0%

SOURCES: Authors' tabulations from DYNASIM4, run id974.
NOTES: We use a real discount rate of 2.5% (5.1% nominal) in these calculations. Residential care is included in community-based, not nursing facilities. LTSS prices are state and setting-specific, based on Hansen Hunter (2018), Genworth (2019), and other sources. Nursing home, home care, and residential care prices are adjusted for wage inflation.

TABLE 3E. Average Present Discounted Value (2020 dollars) of Expenditures from Age 65 through Death Projected for People Turning 65 in 2020-2024: Women with HIPAA-Level LTSS Use						
Payer	**Total Expenditures**		**Community-Based (includes residential care)**		**Nursing Facility**	
	Dollars	**Percentage**	**Dollars**	**Percentage**	**Dollars**	**Percentage**
Public	$69,000	39.3%	$17,900	25.2%	$51,000	48.8%
Medicaid	67,100	38.2%	17,400	24.5%	49,600	47.5%
Other Public	1,900	1.1%	500	0.7%	1,400	1.3%
Private	$106,500	60.7%	$53,100	74.8%	$53,500	51.2%
OOP	100,900	57.5%	50,200	70.7%	50,800	48.6%
Private Insurance	5,600	3.2%	2,900	4.1%	2,700	2.6%
Total	$175,500	100.0%	$71,000	100.0%	$104,500	100.0%

SOURCES: Authors' tabulations from DYNASIM4, run id974.
NOTES: We use a real discount rate of 2.5% (5.1% nominal) in these calculations. Residential care is included in community-based, not nursing facilities. LTSS prices are state and setting-specific, based on Hansen Hunter (2018), Genworth (2019), and other sources. Nursing home, home care, and residential care prices are adjusted for wage inflation.

TABLE 3F. Average Present Discounted Value (2020 dollars) of Expenditures from Age 65 through Death Projected for People Turning 65 in 2020-2024: Men and Women with HIPAA-Level LTSS Use						
Payer	**Total Expenditures**		**Community-Based (includes residential care)**		**Nursing Facility**	
	Dollars	**Percentage**	**Dollars**	**Percentage**	**Dollars**	**Percentage**
Public	$64,300	39.8%	$16,600	24.2%	$47,700	51.5%
Medicaid	61,500	38.1%	16,100	23.5%	45,400	49.0%
Other Public	2,800	1.7%	500	0.7%	2,300	2.5%
Private	$97,100	60.2%	$52,000	75.8%	$45,000	48.5%
OOP	92,200	57.1%	49,000	71.4%	43,100	46.5%
Private Insurance	4,900	3.0%	3,000	4.4%	1,900	2.0%
Total	$161,400	100.0%	$68,600	100.0%	$92,700	100.0%

SOURCES: Authors' tabulations from DYNASIM4, run id974.
NOTES: We use a real discount rate of 2.5% (5.1% nominal) in these calculations. Residential care is included in community-based, not nursing facilities. LTSS prices are state and setting-specific, based on Hansen Hunter (2018), Genworth (2019), and other sources. Nursing home, home care, and residential care prices are adjusted for wage inflation.

TABLE 3G. Average Present Discounted Value (2020 dollars) of Expenditures from Age 65 through Death Projected for People Turning 65 in 2020-2024: Men Excluding Room and Board Component of Residential Care						
Payer	**Total Expenditures**		**Community-Based (includes 1/3 residential care paid by Families)**		**Nursing Facility**	
	Dollars	**Percentage**	**Dollars**	**Percentage**	**Dollars**	**Percentage**
Public	$25,530	43.0%	$6,700	26.1%	$18,830	56.0%
Medicaid	23,830	40.2%	6,500	25.3%	17,330	51.5%
Other Public	1,700	2.9%	200	0.8%	1,500	4.5%
Private	$33,800	57.0%	$19,000	73.9%	$14,800	44.0%
OOP	32,000	53.9%	17,600	68.5%	14,400	42.8%
Private Insurance	1,800	3.0%	1,400	5.4%	400	1.2%
Total	$59,330	100.0%	$25,700	100.0%	$33,630	100.0%

SOURCES: Authors' tabulations from DYNASIM4, run id974.
NOTES: We use a real discount rate of 2.5% (5.1% nominal) in these calculations. Residential care is included in community-based, not nursing facilities. LTSS prices are state and setting-specific, based on Hansen Hunter (2018), Genworth (2019), and other sources. Nursing home, home care, and residential care prices are adjusted for wage inflation.

TABLE 3H. Average Present Discounted Value (2020 dollars) of Expenditures from Age 65 through Death Projected for People Turning 65 in 2020-2024: Women Excluding Room and Board Component of Residential Care						
Payer	**Total Expenditures**		**Community-Based (includes 1/3 residential care)**		**Nursing Facility**	
	Dollars	**Percentage**	**Dollars**	**Percentage**	**Dollars**	**Percentage**
Public	$38,700	41.5%	$10,300	29.2%	$28,400	49.0%
Medicaid	37,600	40.3%	10,000	28.3%	27,600	47.6%
Other Public	1,100	1.2%	300	0.8%	800	1.4%
Private	$54,600	58.5%	$25,000	70.8%	$29,600	51.0%
OOP	51,500	55.2%	23,400	66.3%	28,100	48.4%
Private Insurance	3,100	3.3%	1,600	4.5%	1,500	2.6%
Total	$93,300	100.0%	$35,300	100.0%	$58,000	100.0%

SOURCES: Authors' tabulations from DYNASIM4, run id974.
NOTES: We use a real discount rate of 2.5% (5.1% nominal) in these calculations. Residential care is included in community-based, not nursing facilities. LTSS prices are state and setting-specific, based on Hansen Hunter (2018), Genworth (2019), and other sources. Nursing home, home care, and residential care prices are adjusted for wage inflation.

TABLE 3I. Average Present Discounted Value (2020 dollars) of Expenditures from Age 65 through Death Projected for People Turning 65 in 2020-2024: Combined Excluding Room and Board Component of Residential Care						
Payer	**Total Expenditures**		**Community-Based (includes 1/3 residential care)**		**Nursing Facility**	
	Dollars	**Percentage**	**Dollars**	**Percentage**	**Dollars**	**Percentage**
Public	$32,300	42.1%	$8,600	28.0%	$23,700	51.4%
Medicaid	30,900	40.2%	8,300	27.0%	22,600	49.0%
Other Public	1,400	1.8%	300	1.0%	1,100	2.4%
Private	$44,500	57.9%	$22,100	72.0%	$22,400	48.6%
OOP	42,000	54.7%	20,600	67.1%	21,400	46.4%
Private Insurance	2,500	3.3%	1,500	4.9%	1,000	2.2%
Total	$76,800	100.0%	$30,700	100.0%	$46,100	100.0%

SOURCES: Authors' tabulations from DYNASIM4, run id974.
NOTES: We use a real discount rate of 2.5% (5.1% nominal) in these calculations. Residential care is included in community-based, not nursing facilities. LTSS prices are state and setting-specific, based on Hansen Hunter (2018), Genworth (2019), and other sources. Nursing home, home care, and residential care prices are adjusted for wage inflation.

TABLE 4A. Relationship of DYNASIM Mean Cost Projections (PDV from age 65 under death) to Analogous Kemper, Komisar, and Alecxih Cost Projections: Adjusted for Longevity						
	Ratio of DYNASIM Mean to Life Expectancy Adjusted Kemper, Komisar and Alecxih Mean					
	Price-Adjusted			Wage-Adjusted		
	Total	Community-Based	Nursing Facility	Total	Community-Based	Nursing Facility
Total	1.32	1.58	1.16	1.16	1.39	1.02
Public	1.12	1.13	1.11	0.98	0.99	0.97
Medicare	0.78	0.79	0.77	0.69	0.70	0.68
Medicaid	1.26	1.92	1.12	1.11	1.69	0.98
Other Public	0.67	0.14	n/a	0.59	0.13	n/a
Private	1.54	1.94	1.24	1.36	1.71	1.09
OOP	1.55	1.89	1.27	1.36	1.66	1.12
Private Insurance	1.50	3.59	0.80	1.32	3.16	0.70

SOURCES: Authors' tabulations from DYNASIM4, run id974 and Kemper, Komisar, and Alecxih (2005/2006).
NOTES: We increase the Kemper, Komisar, and Alecxih projections to account for the change in life expectancy across the 2 cohorts. Discount rates differed across the analyses; the Kemper, Komisar, and Alecxih discount rate is higher than the 1 used here (2.5% versus 2.9% real). N/a indicates that the value was 0 in Kemper, Komisar, and Alecxih, so the ratio is undefined.

TABLE 4B. Relationship of DYNASIM Mean Cost Projections (PDV from age 65 under death) to Analogous Kemper, Komisar, and Alecxih Cost Projections: Disaggregation of Community Setting						
	Disaggregated DYNASIM Projection (mean, 2020 dollars)		Ratio of DYNASIM Mean to Life Expectancy-Adjusted Kemper, Komisar and Alecxih Mean			
	Residential Care	Home Care	Residential Care		Home Care	
			Price-Adjusted	Wage-Adjusted	Price-Adjusted	Wage-Adjusted
All	$14,600	$19,400	1.21	1.06	1.98	1.74
Men	$11,100	$17,300	n/a	n/a	n/a	n/a
Women	$17,900	$21,400	n/a	n/a	n/a	n/a

SOURCES: Authors' tabulations from DYNASIM4, run id974 and Kemper, Komisar, and Alecxih (2005/2006).
NOTES: We increase the Kemper, Komisar, and Alecxih projections to account for the change in life expectancy across the 2 cohorts. Discount rates differed across the analyses; the Kemper, Komisar, and Alecxih discount rate is higher than the 1 used here (2.5% versus 2.9% real). N/a indicates that the value was 0 in Kemper, Komisar, and Alecxih, so the ratio is undefined.

TABLE 5A. Distribution of Present Discounted Value (2020 dollars) of LTSS Expenditures from Age 65 to Death Projected for People Turning 65 in 2020-2024: Men												
Payer	Distribution of PDV (2020 dollars) of LTSS Expenditures (% of people)											
	Average	Percent with Any	Zero	<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	200,000-249,999	>= 250,000
Public	$25,600											
Medicaid	23,900	16.5	83.5	2.2	1.7	2.3	1.9	1.3	1.8	1.1	1.2	3.0
Other	1,700	10.4	89.7	8.3	0.2	0.6	0.6	0.2	0.3	0.1	0.0	0.1
Private	$36,300											
OOP	34,500	34.4	65.6	6.7	4.9	5.4	3.4	2.9	3.4	2.3	1.6	3.7
Private insurance	1,800	2.3	97.7	0.4	0.5	0.3	0.5	0.1	0.3	.	0.1	0.2
Total	$61,900	42.0	58.0	7.8	5.2	5.0	3.6	2.7	3.8	2.8	2.5	8.6

SOURCES: Authors' tabulations from DYNASIM4, run id974.
NOTES: We use a real discount rate of 2.5% (5.1% nominal) in these calculations. LTSS prices are state and setting-specific, based on Hansen Hunter (2018), Genworth (2019) and other sources. Nursing home, home care, and residential care prices are adjusted for wage inflation.

TABLE 5B. Distribution of Present Discounted Value (2020 dollars) of LTSS Expenditures from Age 65 to Death Projected for People Turning 65 in 2020-2024: Women												
Payer	Distribution of PDV (2020 dollars) of LTSS Expenditures (% of people)											
	Average	Percent with Any	Zero	<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	200,000-249,999	>= 250,000
Public	$38,600											
Medicaid	37,500	24.3	75.7	2.5	2.2	2.6	2.3	2.5	3.4	2.3	1.7	4.7
Other	1,100	12.4	87.6	11.4	0.3	0.1	0.1	0.1	0.1	0.1	0.0	0.1
Private	$58,700											
OOP	55,600	45.5	54.5	7.6	5.9	6.8	4.3	3.5	5.0	3.0	2.5	7.0
Private insurance	3,100	4.1	95.9	0.6	0.8	0.6	0.5	0.5	0.6	0.1	0.1	0.3
Total	$97,300	54.0	46.0	8.3	5.7	5.8	4.2	3.3	5.5	3.9	3.1	14.2

SOURCES: Authors' tabulations from DYNASIM4, run id974.
NOTES: We use a real discount rate of 2.5% (5.1% nominal) in these calculations. LTSS prices are state and setting-specific, based on Hansen Hunter (2018), Genworth (2019) and other sources. Nursing home, home care, and residential care prices are adjusted for wage inflation.

TABLE 5C. Distribution of Present Discounted Value (2020 dollars) of LTSS Expenditures from Age 65 to Death Projected for People Turning 65 in 2020-2024: Combined Men and Women												
Payer	Distribution of PDV (2020 dollars) of LTSS Expenditures (% of people)											
	Average	Percent with Any	Zero	<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	200,000-249,999	>= 250,000
Public	$32,300											
Medicaid	30,900	20.5	79.5	2.4	2.0	2.5	2.1	1.9	2.6	1.8	1.5	3.9
Other	1,400	11.4	88.6	9.9	0.3	0.3	0.3	0.1	0.2	0.1	0.0	0.1
Private	$47,900											
OOP	45,400	40.1	59.9	7.2	5.4	6.1	3.9	3.2	4.2	2.7	2.0	5.4
Private insurance	2,500	3.2	96.8	0.5	0.6	0.5	0.5	0.3	0.4	0.1	0.1	0.2
Total	$80,200	48.2	51.8	8.1	5.4	5.4	3.9	3.0	4.7	3.4	2.8	11.5

SOURCES: Authors' tabulations from DYNASIM4, run id974.
NOTES: We use a real discount rate of 2.5% (5.1% nominal) in these calculations. LTSS prices are state and setting-specific, based on Hansen Hunter (2018), Genworth (2019) and other sources. Nursing home, home care, and residential care prices are adjusted for wage inflation.

TABLE 6A. Mean and Distribution of Present Discounted Value (2020 dollars) of Lifetime Medicaid LTSS Expenditures Projected for People Turning Age 65 in 2020-2024, by Per Capita Income Quintile at Age 65												
Quintile	Average Expenditures	Percent of People with Expenditures	Distribution of PDV (2020 dollars) of Medicaid LTSS Expenditures (% of people)									
			Zero	<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	200,000-249,999	>=250,000
Lowest	65,900	39.3	60.7	5.0	4.1	3.7	3.4	3.5	5.4	3.1	2.5	8.6
Second	42,500	27.4	72.6	3.4	2.3	3.3	2.9	2.3	3.4	2.0	2.1	5.8
Middle	31,300	21.6	78.4	2.5	2.0	2.8	2.4	2.1	1.9	1.9	1.9	4.1
Fourth	17,600	13.7	86.3	1.5	1.3	2.1	1.3	1.4	1.8	1.6	0.9	1.8
Highest	9,100	7.6	92.4	0.5	0.7	1.2	1.2	0.7	1.4	0.7	0.4	0.8
Total	$30,900	20.5	79.5	2.4	2.0	2.5	2.1	1.9	2.6	1.8	1.5	3.9

SOURCES: Authors' tabulations from DYNASIM4, run id974.
NOTES: We use a real discount rate of 2.5% (5.1% nominal) in these calculations. LTSS prices are state and setting-specific, based on Hansen Hunter (2018), Genworth (2019), and other sources. Nursing home, home care, and residential care prices are adjusted for wage inflation.

TABLE 6B. Mean and Distribution of Present Discounted Value (2020 dollars) of Lifetime Family OOP LTSS Expenditures Projected for People Turning Age 65 in 2020-2024, by Per Capita Income Quintile at Age 65

Quintile	Average Expenditures	Percent of People with Expenditures	Distribution of PDV (2020 dollars) of Medicaid LTSS Expenditures (% of people)									
			Zero	<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	200,000-249,999	>=250,000
Lowest	23,200	31.5	68.5	7.4	5.2	4.9	3.9	2.5	3.4	1.6	0.9	1.9
Second	36,200	40.5	59.5	7.4	6.5	7.6	3.6	3.8	3.7	2.5	1.8	3.6
Middle	42,500	39.7	60.3	7.5	4.7	5.6	4.2	3.5	4.2	2.8	2.0	5.1
Fourth	46,400	41.9	58.1	7.8	5.4	6.6	2.9	3.3	4.6	3.2	2.5	5.6
Highest	66,800	46.9	53.1	6.6	5.6	6.2	4.8	3.1	5.0	3.1	2.8	9.7
Total	44,100	40.1	59.9	7.2	5.4	6.1	3.9	3.2	4.2	2.7	2.0	5.4

SOURCES: Authors' tabulations from DYNASIM4, run id974.
NOTES: We use a real discount rate of 2.5% (5.1% nominal) in these calculations. LTSS prices are state and setting-specific, based on Hansen Hunter (2018), Genworth (2019), and other sources. Nursing home, home care, and residential care prices are adjusted for wage inflation.

TABLE 6C. Mean and Distribution of Present Discounted Value (2020 dollars) of Lifetime Family OOP LTSS Expenditures Projected for People Using LTSS Turning Age 65 in 2020-2024, by Expenditure with Medicaid

	Average Expenditures	Percent of People with Expenditures	Distribution of PDV (2020 dollars) of Family LTSS Expenditures (% of people)							
			<10,000 (including zero)	10,000-24,999	25,000-49,999	50,000-99,999	100,000-149,999	150,000-199,999	200,000-249,999	>=250,000
Users of Medicaid benefits	$88,600	71.6	37.0	8.0	10.6	14.4	9.0	5.4	4.9	10.6
Non-users of Medicaid benefits	$85,900	84.1	33.8	12.5	13.1	13.6	7.8	5.1	3.4	10.7

SOURCES: Authors' tabulations from DYNASIM4, run id974.
NOTES: We use a real discount rate of 2.5% (5.1% nominal) in these calculations. LTSS prices are state and setting-specific, based on Hansen Hunter (2018), Genworth (2019), and other sources. Nursing home, home care, and residential care prices are adjusted for wage inflation.

TABLE 7. Share of Total Lifetime PDV of LTSS Expenditures (2020 dollars) Projected for People Turning Age 65 in 2020-2024, by Duration of HIPAA Service Use and Payer

	Distribution of HIPAA-Level Need in Years (%)					
	<1	1-1.99	2-2.99	3-3.99	4-4.99	>=5
Total	8.4	10.2	12.2	12.2	11.5	45.5
Gender						
Men	9.3	12.5	14.7	12.9	10.0	40.7
Women	7.9	8.9	10.6	11.8	12.3	48.5
Payer						
Medicaid	4.0	6.5	9.2	10.0	11.6	58.8
Family OOP	11.6	13.1	14.7	14.1	11.1	35.4

SOURCES: Authors' tabulations from DYNASIM4, run id974.
NOTES: We use a real discount rate of 2.5% (5.1% nominal) in these calculations. LTSS prices are state and setting-specific, based on Hansen Hunter (2018), Genworth (2019), and other sources. Nursing home and residential care prices are adjusted for wage inflation; home care prices grow with the average of wage and price inflation.

TABLE 8A. Average Sum (2020 dollars) of Lifetime LTSS Expenditures Projected for People Turning 65 in 2020-2024: Men						
Payer	**Total Expenditures**		**Community-Based (includes residential care)**		**Nursing Facility**	
	Dollars	**Percentage**	**Dollars**	**Percentage**	**Dollars**	**Percentage**
Public	$40,500	39.5%	$9,700	21.0%	$30,800	54.6%
Medicaid	37,700	36.8%	9,400	20.3%	28,300	50.2%
Other Public	2,800	2.7%	300	0.6%	2,500	4.4%
Private	$62,000	60.5%	$36,500	79.0%	$25,600	45.4%
OOP	59,200	57.8%	34,300	74.2%	25,000	44.3%
Private Insurance	2,800	2.7%	$2,200	4.8%	600	1.1%
Total	$102,500	100.0%	$46,200	100.0%	$56,400	100.0%

SOURCES: Authors' tabulations from DYNASIM4, run id974.
NOTES: Residential care is included in community-based, not nursing facilities. LTSS prices are state and setting-specific, based on Hansen Hunter (2018), Genworth (2019), and other sources. Nursing home, home care, and residential care prices are adjusted for wage inflation.

TABLE 8B. Average Sum (2020 dollars) of Lifetime LTSS Expenditures Projected for People Turning 65 in 2020-2024: Women						
Payer	**Total Expenditures**		**Community-Based (includes residential care)**		**Nursing Facility**	
	Dollars	**Percentage**	**Dollars**	**Percentage**	**Dollars**	**Percentage**
Public	$65,100	38.1%	$15,100	22.7%	$49,900	47.7%
Medicaid	63,200	37.0%	14,700	22.1%	48,500	46.4%
Other Public	1,900	1.1%	400	0.6%	1,400	1.3%
Private	$105,900	61.9%	$51,300	77.3%	$54,700	52.3%
OOP	100,600	58.8%	48,600	73.2%	52,100	49.8%
Private Insurance	5,300	3.1%	2,700	4.1%	2,600	2.5%
Total	$171,000	100.0%	$66,400	100.0%	$104,600	100.0%

SOURCES: Authors' tabulations from DYNASIM4, run id974.
NOTES: Residential care is included in community-based, not nursing facilities. LTSS prices are state and setting-specific, based on Hansen Hunter (2018), Genworth (2019), and other sources. Nursing home, home care, and residential care prices are adjusted for wage inflation.

TABLE 8C. Average Sum (2020 dollars) of Lifetime LTSS Expenditures Projected for People Turning 65 in 2020-2024: Combined Men and Women						
Payer	**Total Expenditures**		**Community-Based (includes residential care)**		**Nursing Facility**	
	Dollars	**Percentage**	**Dollars**	**Percentage**	**Dollars**	**Percentage**
Public	$53,100	38.5%	$12,500	22.1%	$40,600	50.0%
Medicaid	50,800	36.9%	12,100	21.4%	38,700	47.7%
Other Public	2,300	1.7%	400	0.7%	1,900	2.3%
Private	$84,700	61.5%	$44,100	77.9%	$40,600	50.0%
OOP	80,600	58.5%	41,700	73.7%	38,900	47.9%
Private Insurance	4,100	3.0%	2,400	4.2%	1,700	2.1%
Total	$137,800	100.0%	$56,600	100.0%	$81,200	100.0%

SOURCES: Authors' tabulations from DYNASIM4, run id974.
NOTES: Residential care is included in community-based, not nursing facilities. LTSS prices are state and setting-specific, based on Hansen Hunter (2018), Genworth (2019), and other sources. Nursing home, home care, and residential care prices are adjusted for wage inflation.

TABLE 8D. Average Sum (2020 dollars) of Lifetime LTSS Expenditures Projected for People Turning 65 in 2020-2024: Men with HIPAA-Level LTSS Use						
Payer	**Total Expenditures**		**Community-Based (includes residential care)**		**Nursing Facility**	
	Dollars	**Percentage**	**Dollars**	**Percentage**	**Dollars**	**Percentage**
Public	$92,000	39.0%	$22,000	20.8%	$71,000	55.0%
Medicaid	86,000	36.4%	21,000	19.8%	65,000	50.4%
Other Public	6,000	2.5%	1,000	0.9%	6,000	4.7%
Private	$144,000	61.0%	$84,000	79.2%	$58,000	45.0%
OOP	138,000	58.5%	79,000	74.5%	57,000	44.2%
Private Insurance	6,000	2.5%	5,000	4.7%	1,000	0.8%
Total	$236,000	100.0%	$106,000	100.0%	$129,000	100.0%

SOURCES: Authors' tabulations from DYNASIM4, run id974.
NOTES: Residential care is included in community-based, not nursing facilities. LTSS prices are state and setting-specific, based on Hansen Hunter (2018), Genworth (2019), and other sources. Nursing home, home care, and residential care prices are adjusted for wage inflation.

TABLE 8E. Average Sum (2020 dollars) of Lifetime LTSS Expenditures Projected for People Turning 65 in 2020-2024: Women with HIPAA-Level LTSS Use						
Payer	**Total Expenditures**		**Community-Based (includes residential care)**		**Nursing Facility**	
	Dollars	**Percentage**	**Dollars**	**Percentage**	**Dollars**	**Percentage**
Public	$116,000	37.5%	$27,000	22.5%	$90,000	47.6%
Medicaid	113,000	36.6%	26,000	21.7%	87,000	46.0%
Other Public	3,000	1.0%	1,000	0.8%	3,000	1.6%
Private	$193,000	62.5%	$93,000	77.5%	$99,000	52.4%
OOP	184,000	59.5%	88,000	73.3%	94,000	49.7%
Private Insurance	9,000	2.9%	5,000	4.2%	5,000	2.6%
Total	$309,000	100.0%	$120,000	100.0%	$189,000	100.0%

SOURCES: Authors' tabulations from DYNASIM4, run id974.
NOTES: Residential care is included in community-based, not nursing facilities. LTSS prices are state and setting-specific, based on Hansen Hunter (2018), Genworth (2019), and other sources. Nursing home, home care, and residential care prices are adjusted for wage inflation.

TABLE 8F. Average Sum (2020 dollars) of Lifetime LTSS Expenditures Projected for People Turning 65 in 2020-2024: Combined Men and Women with HIPAA-Level LTSS Use						
Payer	**Total Expenditures**		**Community-Based (includes residential care)**		**Nursing Facility**	
	Dollars	**Percentage**	**Dollars**	**Percentage**	**Dollars**	**Percentage**
Public	$126,000	42.1%	$35,000	28.2%	$93,000	53.1%
Medicare	20,000	6.7%	10,000	8.1%	11,000	6.3%
Medicaid	101,000	33.9%	24,000	19.4%	78,000	44.8%
Other Public	5,000	1.5%	1,000	0.8%	4,000	2.0%
Private	$172,000	57.7%	$89,000	71.8%	$81,000	46.6%
OOP	164,000	55.0%	84,000	67.7%	78,000	44.8%
Private Insurance	8,000	2.7%	5,000	4.0%	3,000	1.7%
Total	$298,000	100.0%	$124,000	100.0%	$174,000	100.0%

SOURCES: Authors' tabulations from DYNASIM4, run id974.
NOTES: Residential care is included in community-based, not nursing facilities. LTSS prices are state and setting-specific, based on Hansen Hunter (2018), Genworth (2019), and other sources. Nursing home, home care, and residential care prices are adjusted for wage inflation.

TABLE 9A. Distribution of the Sum (2020 dollars) of Lifetime LTSS Expenditures Projected for People Turning 65 in 2020-2024: Men

Payer	Average	Percent with Any	Distribution of Sum (2020 dollars) of LTSS Expenditures (% of people)									
			Zero	<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	200,000-249,999	>=250,000
Public	$40,500											
Medicaid	37,700	16.5	83.5	1.8	1.4	1.6	1.3	1.1	1.8	1.4	1.0	5.2
Other Public	2,800	10.4	89.7	8.1	0.3	0.2	0.5	0.3	0.5	0.3	0.2	0.1
Private	$62,000											
OOP	59,200	34.4	65.6	4.7	4.8	3.6	3.3	2.5	3.4	2.7	1.8	7.7
Private Insurance	2,800	2.3	97.7	0.3	0.4	0.4	0.3	0.3	0.2	0.2	0.1	0.3
Total	$102,500	41.7	58.3	5.7	5.1	3.5	2.9	2.6	3.2	2.9	2.3	13.6

SOURCES: Authors' tabulations from DYNASIM4, run id974.
NOTES: LTSS prices are state and setting-specific, based on Hansen Hunter (2018), Genworth (2019), and other sources. Nursing home, home care, and residential care prices are adjusted for wage inflation.

TABLE 9B. Distribution of the Sum (2020 dollars) of Lifetime LTSS Expenditures Projected for People Turning 65 in 2020-2024: Women

Payer	Average	Percent with Any	Distribution of Sum (2020 dollars) of LTSS Expenditures (% of people)									
			Zero	<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	200,000-249,999	>=250,000
Public	$65,100											
Medicaid	63,200	24.3	75.7	2.0	1.5	1.7	1.7	1.6	2.6	2.3	2.0	9.0
Other Public	1,900	12.4	87.6	11.0	0.6	0.2	0.1	0.1	0.1	0.1	0.1	0.2
Private	$105,900											
OOP	100,600	45.5	54.5	5.2	4.9	5.3	3.7	2.9	4.2	3.0	2.9	13.4
Private Insurance	5,300	4.1	95.9	0.3	0.6	0.6	0.4	0.4	0.6	0.5	0.2	0.5
Total	$171,000	53,4	46.6	6.0	4.5	4.6	3.2	2.8	4.1	3.4	2.9	21.8

SOURCES: Authors' tabulations from DYNASIM4, run id974.
NOTES: LTSS prices are state and setting-specific, based on Hansen Hunter (2018), Genworth (2019), and other sources. Nursing home, home care, and residential care prices are adjusted for wage inflation.

TABLE 9C. Distribution of the Sum (2020 dollars) of Lifetime LTSS Expenditures Projected for People Turning 65 in 2020-2024: Combined Men and Women

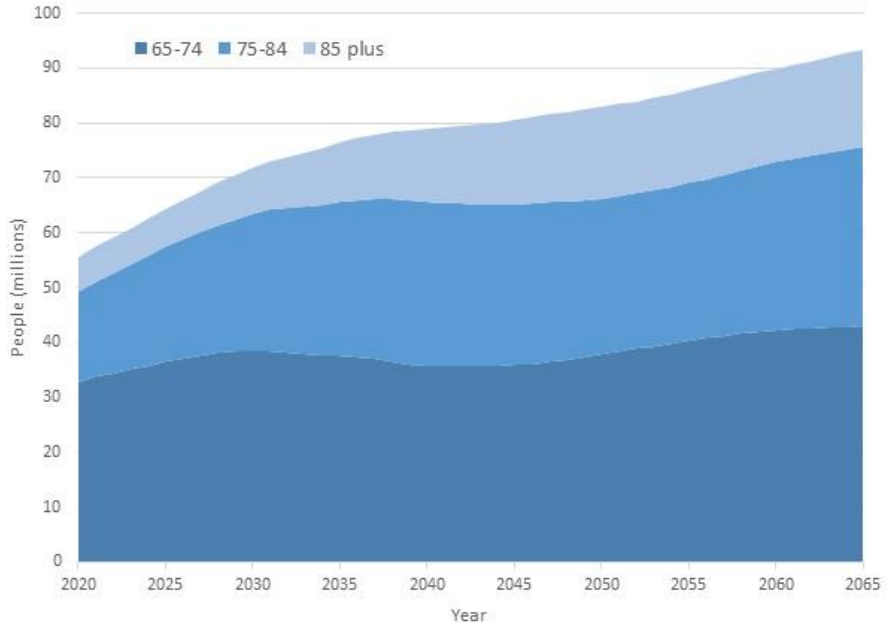
Payer	Average	Percent with Any	Distribution of Sum (2020 dollars) of LTSS Expenditures (% of people)									
			Zero	<10,000	10,000-24,999	25,000-49,999	50,000-74,999	75,000-99,999	100,000-149,999	150,000-199,999	200,000-249,999	>=250,000
Public	$53,100											
Medicaid	50,800	20.5	79.5	1.9	1.4	1.7	1.5	1.4	2.2	1.8	1.5	7.2
Other Public	2,300	11.4	88.6	9.6	0.5	0.2	0.3	0.2	0.3	0.2	0.1	0.2
Private	$84,700											
OOP	80,600	40.1	59.9	5.0	4.8	4.5	3.5	2.7	3.8	2.9	2.4	10.6
Private Insurance	4,100	3.2	96.8	0.3	0.5	0.5	0.3	0.4	0.4	0.3	0.2	0.4
Total	$137,800	47.7	52.3	5.9	4.8	4.1	3.1	2.7	3.7	3.1	2.6	17.8

SOURCES: Authors' tabulations from DYNASIM4, run id974.
NOTES: LTSS prices are state and setting-specific, based on Hansen Hunter (2018), Genworth (2019), and other sources. Nursing home, home care, and residential care prices are adjusted for wage inflation.

TABLE 10A. Mean Present Value and Sum (2020 dollars) of Informal LTSS Projected for People Turning 65 in 2020-2024, by Gender and Income Quintile at Age 65				
	Present Value		Sum	
	All	Users	All	Users
All	$77,200	$133,600	$111,200	$192,600
Sex				
Men	$77,200	$136,200	$108,300	$190,900
Women	77,100	131,300	114,000	194,100
Income quintile at age 65				
Lowest	$100,200	$149,700	$137,600	$205,600
Second	87,900	140,700	122,900	196,700
Middle	80,700	134,500	116,700	194,400
Fourth	74,600	129,900	110,000	191,500
Highest	66,400	126,500	102,000	194,400
SOURCES: Authors' tabulations from DYNASIM4, run id974. **NOTES**: Value of care is based on state-specific prices for an hour of care, based on Genworth (2019).				

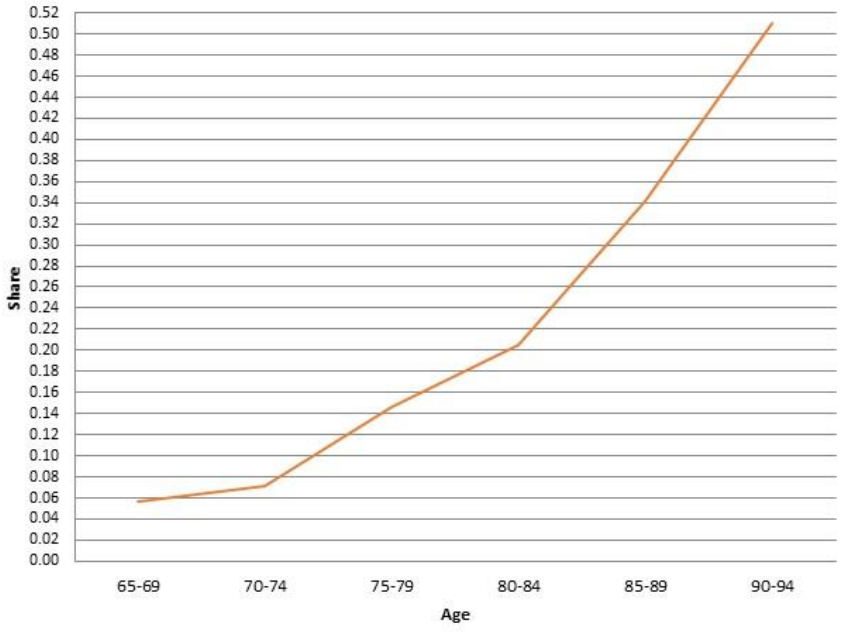
TABLE 10B. Projected Distribution of Present Value (2020 dollars) of Informal LTSS for People Turning 65 in 2020-2024, by Gender at Age 65									
	Distribution of PDV (2020 dollars) of Unpaid Care (% of people)								
	<$10,000	$10,000-24,999	$25,000-49,999	$50,000-74,999	$75,000-99,999	$100,000-149,999	$150,000-199,999	$200,000-249,999	>=$250,000
All	14.1	12.2	16.0	10.4	8.0	12.0	8.6	6.3	12.5
Men	15.4	12.1	16.4	10.0	7.4	11.6	8.5	6.5	12.1
Women	12.9	12.2	15.6	10.8	8.5	12.4	8.7	6.1	12.8
SOURCES: Authors' tabulations from DYNASIM4, run id974. **NOTES**: Value of care is based on state-specific prices for an hour of care, based on Genworth (2019).									

FIGURE 1. Projected Population Age 65 or Older by Age and Year: 2020-2065



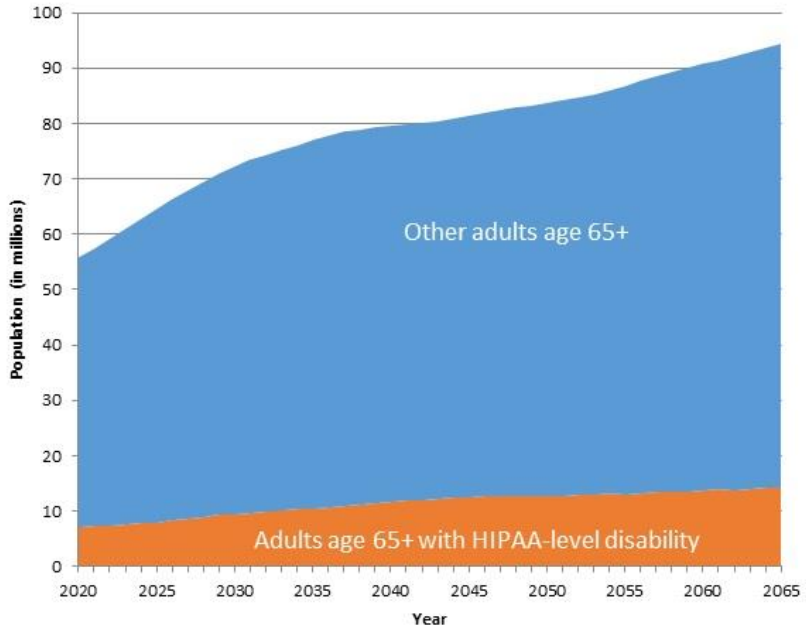
SOURCE: Social Security Administration projections, intermediate assumptions of the 2020 Trustees Report, July population (Board of Trustees 2020).

FIGURE 2. Shares of the Population Meeting HIPAA Disability Criteria by Age, 2015



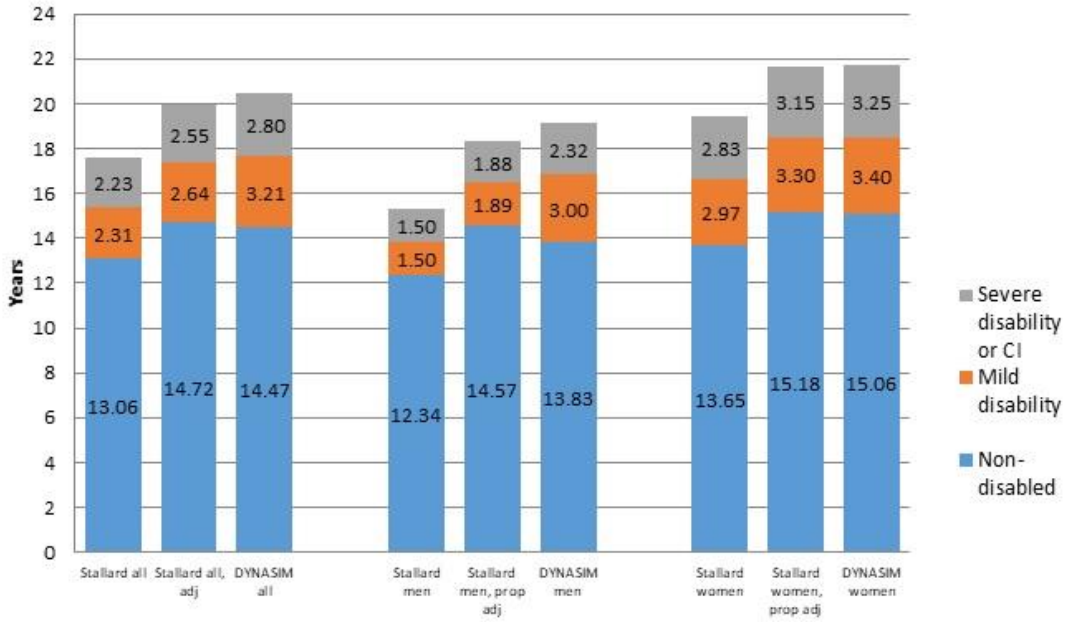
SOURCE: Tabulations from 2015 NHATS by Brenda Spillman.
NOTE: "HIPAA level" is defined as needing substantial assistance from another person with at least 2 ADLs or supervision due to severe cognitive impairment that is expected to last at least 90 days.

FIGURE 3. Total Population Age 65 and Older (in millions), Including Number of People Projected to Meet HIPAA Disability Criteria, 2020-2065



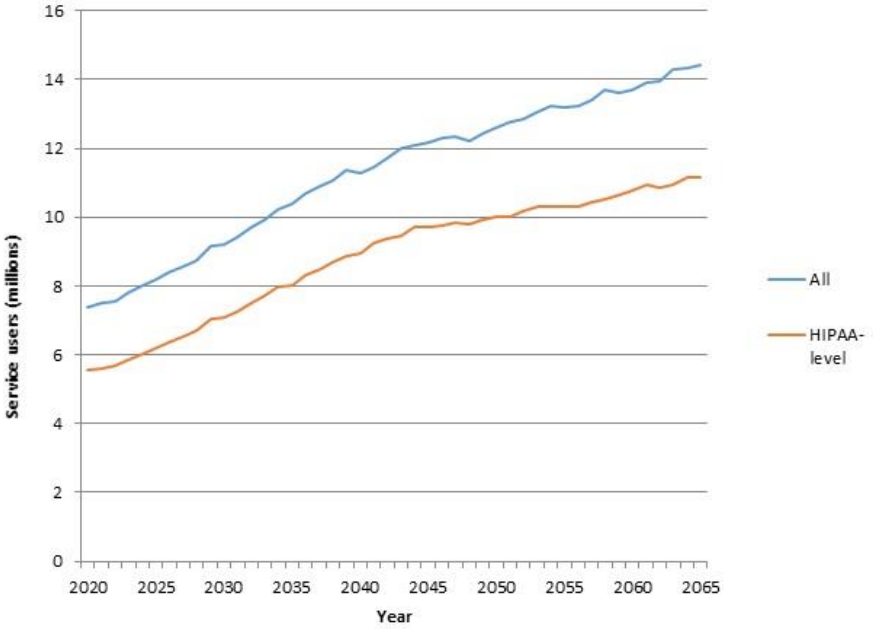
SOURCE: Authors' tabulations from DYNASIM4, run id974.
NOTES: "HIPAA level" is defined as needing substantial assistance with at least 2 ADLs or supervision due to severe cognitive impairment that is expected to last at least 90 days.

FIGURE 4. Expected Time from Age 65 to Death in Various Disability States, by Sex: Comparisons of DYNASIM Projections for Birth Cohort Turning 65 in 2020-2024 with Stallard Projection for Those Age 65 and Older in Historical Period



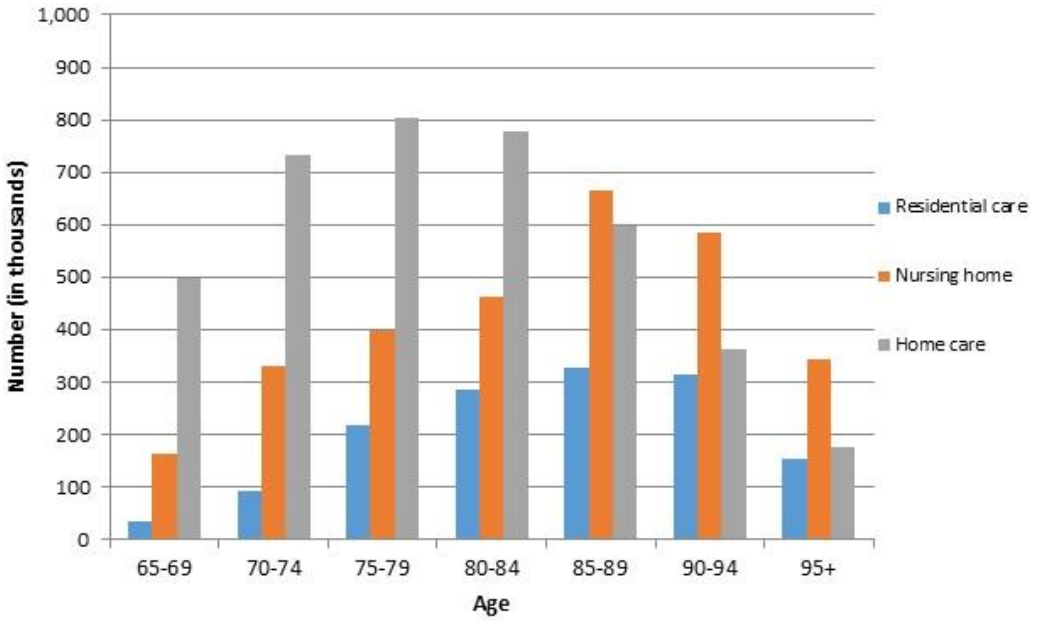
SOURCES: Authors' tabulations from DYNASIM4, run id974 and Stallard (2011). Stallard estimates are based on data from the NLTCS from 1982, 1984, 1989, 1994, 1999, and 2002. Stallard adjusted estimates account for life expectancy growth between the midpoint of these estimation sources (1992) and 2022 (midpoint of DYNASIM sample from 2020-2024) and assume that the life expectancy gain will be split between disabled and healthy life expectancy in the same shares as in the historical estimates.

FIGURE 5. Total Population Age 65 and Older (in millions) Using LTSS, by HIPAA-Level Disability Status, 2020-2065



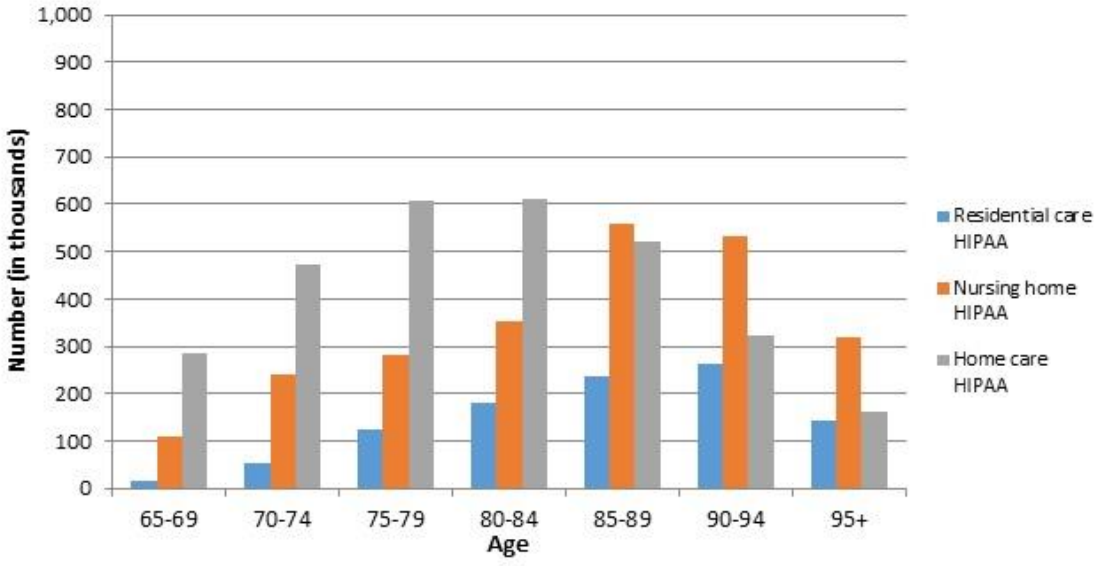
SOURCE: Authors' tabulations from DYNASIM4, run id974.
NOTES: "HIPAA-level" is defined as needing substantial assistance with at least 2 ADLs or supervision due to severe cognitive impairment that is expected to last at least 90 days.

FIGURE 6A. Population Age 65 and Older (in thousands) Using LTSS, by Age, 2020: Total Population



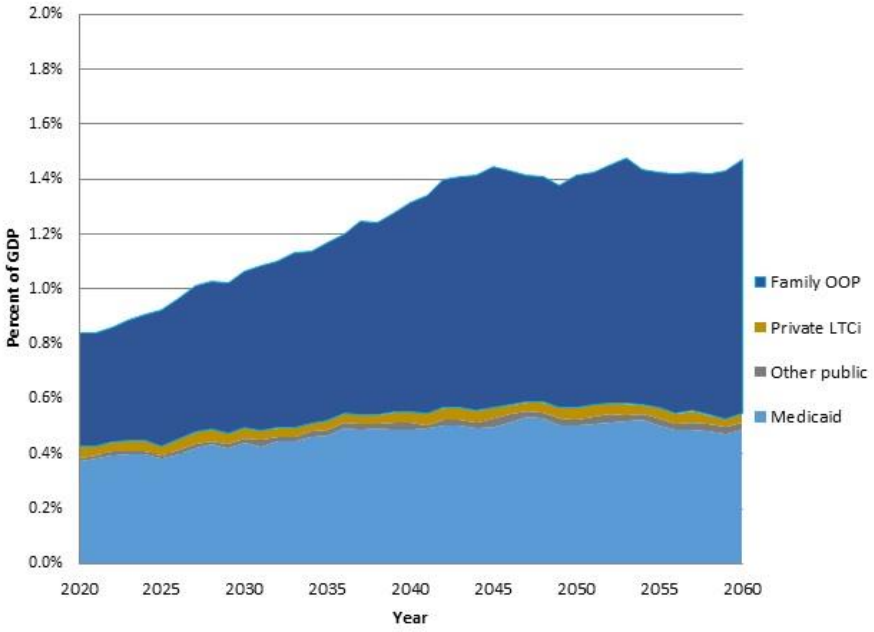
SOURCE: Authors' tabulations from DYNASIM4, run id974.
NOTES: Reflects service use at any point during the year, so is not directly comparable to sources that examine LTSS use on a single day. "HIPAA level" is defined as needing substantial assistance with at least 2 ADLs or supervision due to severe cognitive impairment that is expected to last at least 90 days.

FIGURE 6B. Population Age 65 and Older (in thousands) Using LTSS, by Age, 2020: HIPAA Disability Level



SOURCE: Authors' tabulations from DYNASIM4, run id974.
NOTES: Reflects service use at any point during the year, so is not directly comparable to sources that examine LTSS use on a single day. "HIPAA level" is defined as needing substantial assistance with at least 2 ADLs or supervision due to severe cognitive impairment that is expected to last at least 90 days.

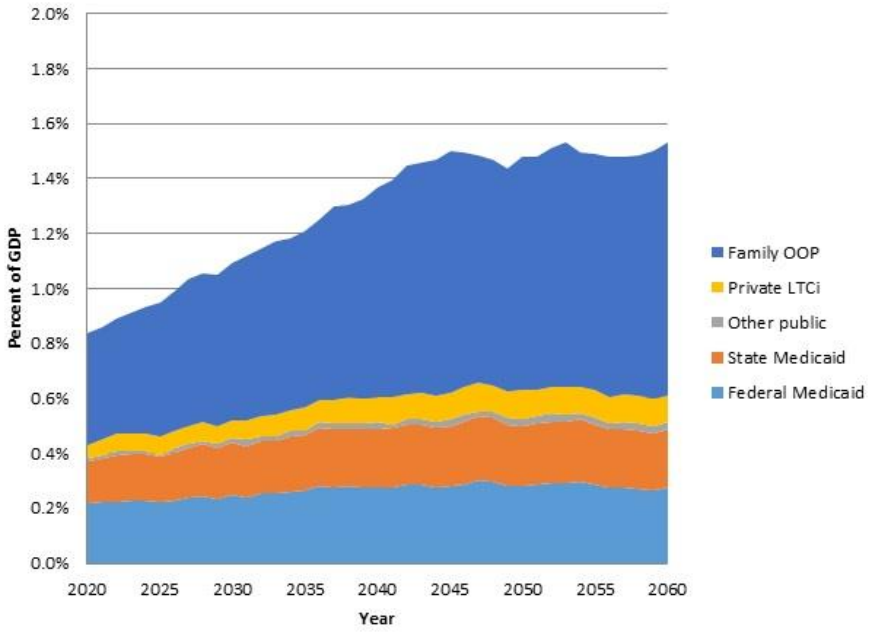
FIGURE 7A. Total Aged HIPAA-Level LTSS Expenditures by Imputed Payer as a Percent of GDP, 2020-2060, with State and Federal Medicaid Combined



SOURCE: Authors' tabulations from DYNASIM4, run id974.

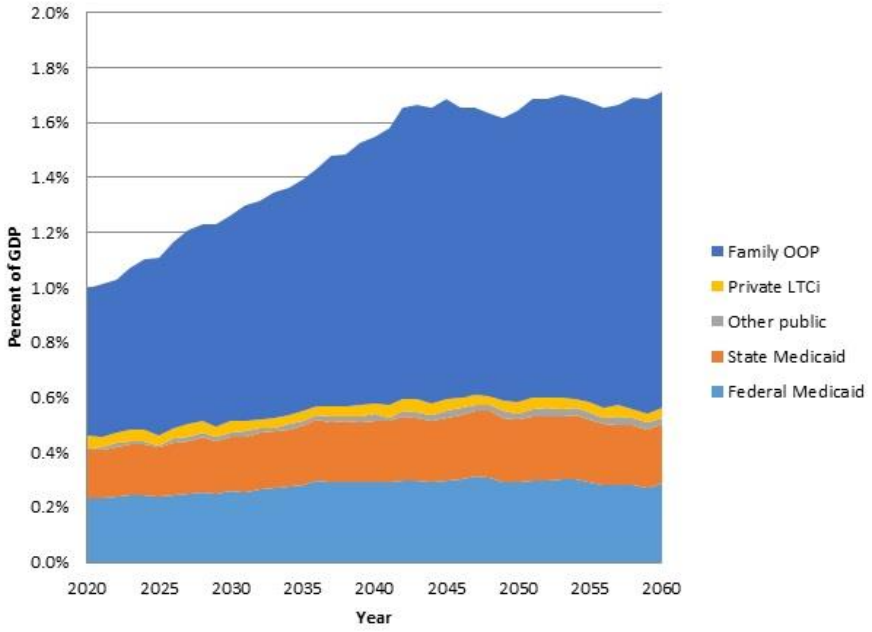
NOTES: Includes only LTSS expenditures for adults ages 65 and older who need substantial assistance with at least 2 ADLs or are severely cognitively impaired with disabilities that are expected to last at least 90 days. Our concept of LTSS includes only those services delivered in the community or traditional, long-stay nursing homes that focus on meeting daily personal needs, like bathing, dressing, eating, transferring, and toileting or providing supervision for those whose health and safety require (for example, for those with severe cognitive impairment). When evaluating Medicaid, we include any services that Eiken et al. (2018) include. For other payers, needs arise due to a disability that has lasted at least 90 days. We exclude services that Medicare covers, such as post-acute care or home health. We exclude other types of services delivered in residential settings, like rehabilitation for substance abuse/addiction or mental health alone. We attempt to include care costs that families incur in private transactions (see Newquist, DeLiema, and Wilber [2015] or Seavey and Marquand [2011] for discussion).

FIGURE 7B. Total Aged HIPAA-Level LTSS Expenditures by Imputed Payer as a Percent of GDP, 2020-2060, with State and Federal Medicaid Displayed Separately



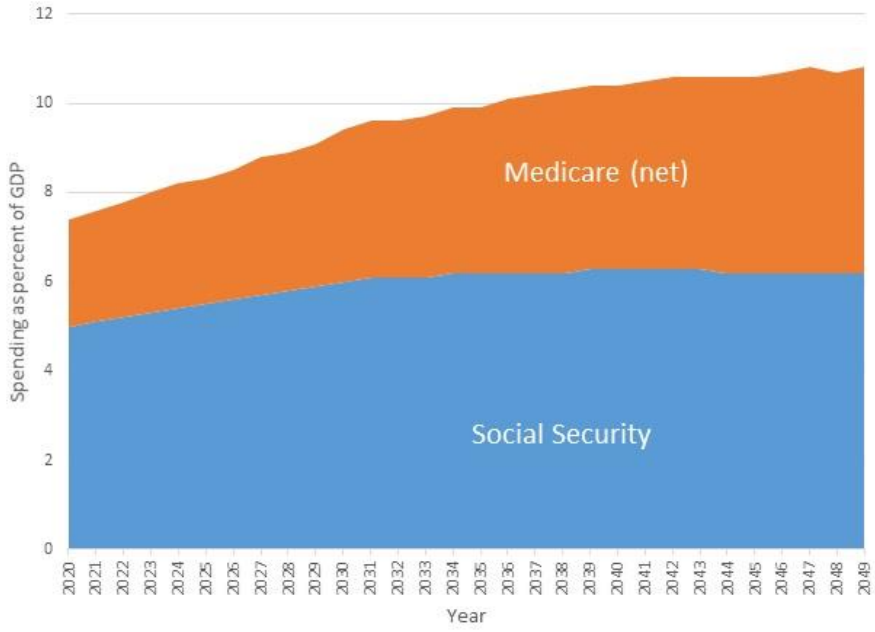
SOURCE: Authors' tabulations from DYNASIM4, run id974.
NOTES: Includes only LTSS expenditures for adults ages 65 and older who need substantial assistance with at least 2 ADLs or are severely cognitively impaired.

FIGURE 7C. Aged LTSS Expenditures, Including Spending below the HIPAA-Level, by Payer as a Percent of GDP, 2020-2060, with State and Federal Medicaid Displayed Separately



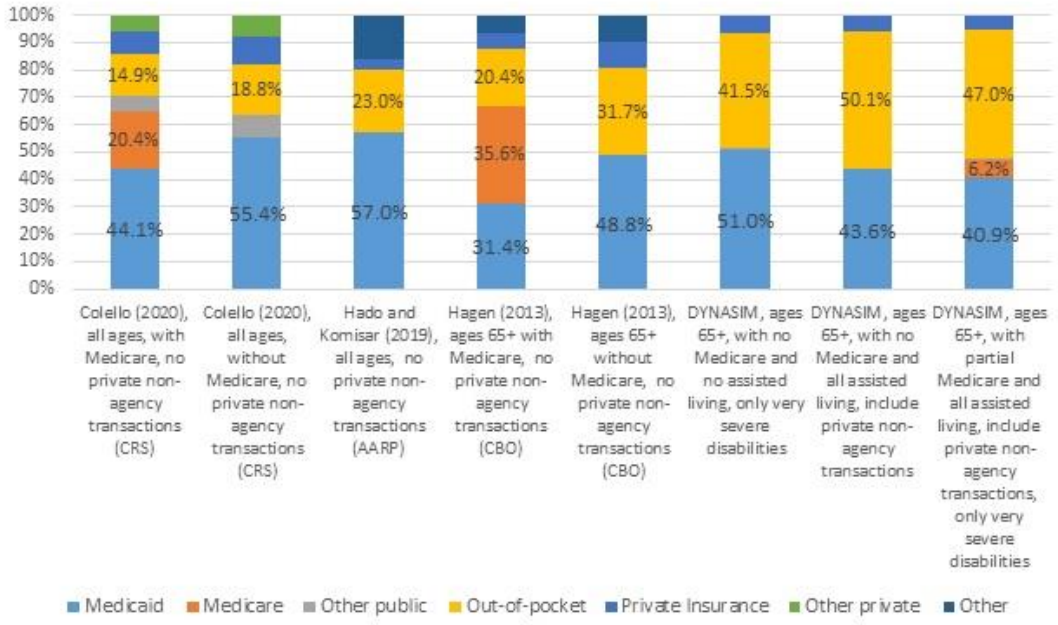
SOURCE: Authors' tabulations from DYNASIM4, run id974.

FIGURE 8. Projected Social Security and Medicare Expenditures as a Share of GDP, 2020-2049



SOURCE: CBO (2019), uses extended baseline assumptions.

FIGURE 9. Alternative Estimates of the Composition of LTSS Spending by Payer



SOURCE: Authors' tabulations from DYNASIM4, run id974, Colello (2020), Hado and Komisar (2019), and Hagen (2013).

BOX 1. Should We Include Medicare as a Payer for LTSS?

Many adults are confused about whether Medicare covers personal assistance if they develop LTSS needs (also referred to as long-term care needs).

CMS is quite clear about Medicare policies on in its website (https://www.medicare.gov/coverage/long-term-care), which states the following:

- "Medicare doesn't cover long-term care (also called custodial care), if that's the only care you need. Most nursing home care is custodial care."
- "You pay 100% for non-covered services, including most long-term care."
- "Long-term care is a range of services and support for your personal care needs. Most long-term care isn't medical care. Instead, most long-term care is help with basic personal tasks of everyday life, sometimes called activities of daily living."

Because Medicare does not cover LTSS when it is the only care people need, some analysts exclude Medicare when describing who pays for LTSS (Hado and Komisar 2019). However, several prominent government publications describe Medicare as an important LTSS payer (Hagen 2013; Colello 2020) and include all Medicare services delivered in certain settings as LTSS. They choose to do so because National Health Expenditure Accounts data enable researchers to determine the settings in which care is delivered, but not to determine whether the care is non-medical; disaggregation is challenging.

In a departure from our 2016 brief (Favreault and Dey), we follow Hado and Komisar (2019) and do not include any incidental care that Medicare pays for in our projections in this 2020 brief.

APPENDIX A. ADDITIONAL TABLES

TABLE A1. Summary of Core Processes Modeled in DYNASIM4: Disability and Health Status		
Process	**Data**	**Form and Predictors**
Disability and Health Status Sector		
Health status (5-category)	HRS (1992-2012) matched to earnings data	Projected at ages 51 and older. Ordered logit models (initial conditions for those not observed on the SIPP, and then lagged status-specific transition models) incorporate various socioeconomic differences (age, education, lifetime earnings, race/ethnicity, marital status and nativity).
Counts of limitations in IADLs	HRS (1994-2012) matched to earnings data; relative age to imply time trend	Projected at ages 51 and older. Ordered logit models (initial conditions for those not observed on SIPP, and then lagged status-specific transition models) incorporate health status, socioeconomic differences (relative age, education, lifetime earnings, race/ethnicity, marital status, and nativity), prior period lags, and age interactions. IADLs predict ADLs.
Chronic health conditions counts (now models stroke separately)	HRS (1994-2010/2012) matched to earnings data	Projected at ages 51 and older. Ordered logit models (initial conditions at baseline, and then lagged status-specific transition models) incorporate health status, IADL limits, ADL limits, mortality, socioeconomic differences (age, education, race/ethnicity, marital status and nativity).
Cognitive status (TICS)	HRS (1994-2014)	Projected at ages 65 and older. Probit for presence of a score and then count models (initial conditions at baseline, and then lagged status-specific transition models). Predictors include age, race/ethnicity, sex, education, health status, ADL limitations, IADL limitations, family income as a percent of poverty. Error term for subsequent status is redrawn once between age 67 and death.
Indicator of whether ADL limitations meet trigger status	MCBS (2011-2013), but calibrated to user targets	Predictors include age, education, health status, number of limitations in IADLs, service use (nursing home and home care), mortality, number of chronic conditions, race, Medicaid receipt.

TABLE A2. Summary of Core Processes Modeled in DYNASIM3: Demand and Prices for LTSS		
Process	**Data**	**Form and Predictors**
Long-Term Services and Supports		
Use of home care, nursing home, and residential care	HRS (1994-2010)	Projected at ages 65 and older. Trivariate probit model incorporates various socioeconomic differences (age, education, race/ethnicity, family income, insurance status, marital status, nativity and number of children, wealth). Also includes chronic conditions, cognitive status, limitations in IADLs/ADLs, health status, and mortality.
Intensity of LTSS use (home care hours and nursing home days)	HRS (2002-2010); NHATS (2011)	Separate zero-truncated negative binomial models for those projected to have either type of expense; incorporates various socioeconomic differences (age, education, race/ethnicity, family income, insurance status, marital status, nativity and number of children, wealth). Also includes chronic conditions, cognitive impairment, limitations in IADLs/ADLs, and health status. For home care, use NHATS table to translate monthly into annual.
LTSS prices, Medicaid	Various (e.g., Eljay 2016, 2015, 2014; Hansen Hunter 2018; Mollica 2009; Ng et al. 2014)	Use state-specific Medicaid rates from various review articles when attributing costs for LTSS. Nursing home and residential care indexed to wage inflation after baseline. Home care is indexed to the average of wage and price inflation.
LTSS prices, non-Medicaid	Genworth (2016, 2017, 2018, 2019)	State-specific. Use median, semi-private NH rooms, home health aide rates. Nursing home and residential care prices are indexed to wage inflation after baseline. Home care prices are indexed to the average of wage and price inflation after baseline. Assume that user provided share of people with family income of at least 5 times poverty pays above-market rates and a user provided share of people with family income of less than 3 times poverty pays below-market rates, with variation based on income level.

TABLE A3. Summary of Core Processes Modeled in DYNASIM3: Payer Allocation for LTSS		
Process	**Data**	**Form and Predictors**
Formal Long-Term Services and Supports		
Private long-term care insurance: purchase	HRS (2002-2010); benchmarked to AALTCI	Project unlapsed coverage as of age 65 (using sample of 60-65 year olds). Predictors include education, life expectancy, health status, wealth, number of children, nativity, race/ethnicity, gender.
Private long-term care insurance: plan features	Parameters from AALTCI and private industry data; Broker World Survey (July 2014)	Plans have varied daily/lifetime maximum (5 and 6 groups, respectively), elimination periods (4 groups), inflation protection (yes/no). Lapse is projected from ages 66 onward. Premiums vary based on gender and marital status, projected issue age, and assigned plan features (benefit period and inflation protection).
Allocation of LTSS costs to payers	MCBS (2007-2009, 2011-2013), plus Medicaid and private plan rules	Use Medicaid, Medicare, and stylized private plan rules to determine eligibility for payment from different sources. Estimates from MCBS and historical aggregates provide targets.
U.S. Department of Veterans Affairs nursing home	MCBS (2007-2009, 2011-2013)	Applied only to those in nursing homes. Predictors include gender, education, race, IADL limitations, health status, chronic conditions, Medicaid status.
Value of Unpaid Care		
Family care	Genworth (2016, 2017, 2018, 2019); HRS (2014)	Assigned based on the residual between LTSS need and formal LTSS use and calibrated to HRS data

TABLE A4. Summary of Core Processes Modeled in DYNASIM3: Health Care Coverage and Use (excluding LTSS)		
Process	**Data**	**Form and Predictors**
Medicare (including RHI)		
Medicare and total health spending	MCBS (2007-2009, 2011-2013, 2015-2016)	Projected at ages 65 and older. Square root for baseline, includes first-order autoregressive error that varies based on prior spending. Baseline predictors include age, sex, education, mortality, marital status, insurance type, health status, chronic conditions, ADL/IADL limitations, ln (per capita income), region, nursing home status, household size. Growth function takes into account technological change and growth in costs shares (premiums and OOP).
Insurance status	MCBS (2007-2009, 2011-2013, 2015-2016)	Seven stylized statuses (Medicaid, other public, employer fee-for-service, employer HMO, self-pay fee-for-service, self-pay HMO, no supplemental) projected at ages 65 and older. Multinomial logit for baseline. Baseline predictors include age, education, employment status, gender, health status, limitations in ADLs/IADLs, race/ethnicity, marital status, mortality, chronic conditions, household size. Transition model takes into account premiums and health status.
Premiums	Rule based	Take into account spending growth, changes in insurance status, load factors.
OOP	MCBS (2007-2009, 2011-2013, 2015-2016)	Varies by insurance type and decile of spending.
Medicaid		
Medicaid eligibility	Rule based, state-specific	Separate full-scope pathways for SSI receipt/eligibility, percent of poverty, medically needy, non-SSI in nursing home if income near SSI limits, HCBS; also QMB, SLMB, and QI. Accounts for cost shares, spousal impoverishment, partnership programs, and other details.
Medicaid take-up	Stochastic, with grounding in related literature	For medically needy, varies by spending quintile and income quintile; lower for MSPs than for full-scope pathways, with QMB higher than SLMB and SLMB higher than QI. Because HCBS programs have waiting lists, take-up is assumed to be 100%. Similarly, nursing homes are assumed to require Medicaid application for those qualifying through that pathway (i.e., take up is also 100%).

IMPROVING HEALTH AND LONG-TERM CARE MODELING CAPACITY

Reports Available

Economic Hardship and Medicaid Enrollment in Later Life: Assessing the Impact of Disability, Health, and Marital Status Shocks

HTML https://aspe.hhs.gov/basic-report/economic-hardship-and-medicaid-enrollment-later-life-assessing-impact-disability-health-and-marital-status-shocks

PDF https://aspe.hhs.gov/pdf-report/economic-hardship-and-medicaid-enrollment-later-life-assessing-impact-disability-health-and-marital-status-shocks

Extended LTSS Utilization Makes Older Adults More Reliant on Medicaid Issue Brief

HTML https://aspe.hhs.gov/basic-report/extended-ltss-utilization-makes-older-adults-more-reliant-medicaid-issue-brief

PDF https://aspe.hhs.gov/pdf-report/extended-ltss-utilization-makes-older-adults-more-reliant-medicaid-issue-brief

Most Older Adults Are Likely to Need and Use Long-Term Services and Supports Issue Brief

HTML https://aspe.hhs.gov/basic-report/most-older-adults-are-likely-need-and-use-long-term-services-and-supports-issue-brief

PDF https://aspe.hhs.gov/pdf-report/most-older-adults-are-likely-need-and-use-long-term-services-and-supports-issue-brief

Risk of Economic Hardship Among Older Adults Issue Brief

HTML https://aspe.hhs.gov/basic-report/risk-economic-hardship-among-older-adults-issue-brief

PDF https://aspe.hhs.gov/pdf-report/risk-economic-hardship-among-older-adults-issue-brief

The Risk and Costs of Severe Cognitive Impairment at Older Ages: Literature Review and Projection Analyses

HTML https://aspe.hhs.gov/basic-report/risk-and-costs-severe-cognitive-impairment-older-ages-literature-review-and-projection-analyses

PDF https://aspe.hhs.gov/pdf-report/risk-and-costs-severe-cognitive-impairment-older-ages-literature-review-and-projection-analyses

Long-Term Services and Supports for Older Americans: Risks and Financing, 2020 Research Brief

HTML https://aspe.hhs.gov/basic-report/long-term-services-and-supports-older-americans-risks-and-financing-2020-research-brief

PDF https://aspe.hhs.gov/pdf-report/long-term-services-and-supports-older-americans-risks-and-financing-2020-research-brief

Projections of Risk of Needing Long-Term Services and Supports at Ages 65 and Older

HTML https://aspe.hhs.gov/basic-report/projections-risk-needing-long-term-services-and-supports-ages-65-and-older

PDF https://aspe.hhs.gov/pdf-report/projections-risk-needing-long-term-services-and-supports-ages-65-and-older

The Risk and Costs of Severe Cognitive Impairment at Older Ages: Key Findings from our Literature Review and Projection Analyses Research Brief

HTML https://aspe.hhs.gov/basic-report/risk-and-costs-severe-cognitive-impairment-older-ages-key-findings-our-literature-review-and-projection-analyses-research-brief

PDF https://aspe.hhs.gov/pdf-report/risk-and-costs-severe-cognitive-impairment-older-ages-key-findings-our-literature-review-and-projection-analyses-research-brief