A Critical Review of the Urban Institute Model of Financing Long-Term Services and Supports

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Abstract

Since the demise of the Community Living Assistance Services and Supports (CLASS) insurance program in the Patient Protection and Affordable Care Act (ACA) covering long-term care and since the majority report of the 2013 Commission on Long-Term Care, which did not endorse a new social insurance program, some advocates and analysts have been looking for other means to encourage policymakers to create a mandatory, tax-based social insurance program to finance long-term care. These advocates and analysts will find some comfort in the Urban Institute scoring model, which shows that the cost of such a program is surprisingly low. But a closer examination of the assumptions and methodology of the Urban Institute model reveals many sources leading to a significant underestimate of the cost. In particular, compared with the mainstream professional literature, Congressional Budget Office and Social Security Trustees models, and actuarial pricing, the Urban Institute assumes that the elderly (above age 65) population is healthier, experiences lower incidence and duration of disability, and gets significantly more unpaid care, both currently and, especially, projected into the future. The model also suffers from a policy bias—it is set up to consider only major federal programs, not the creation of varied incentives to encourage retired households to get private insurance and asset holdings to cover the long-term-care risk.

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A Critical Review of the Urban Institute Model of Financing Long-Term Services and Supports

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Introduction

For some time now, some analysts, advocates, and policymakers have recommended the creation of a new social insurance program to finance long-term services and supports (LTSS) for the working-age disabled population and, in particular, the elderly disabled population. This recommendation came close to fruition when the Community Living Assistance Services and Supports (CLASS) program was included in the Patient Protection and Affordable Care Act (ACA) and was used in the scoring to help fund that legislation over Congress's 10-year scoring window. CLASS would have been a national, voluntary insurance program sponsored and administered by the federal government. Under this program, most workers could have purchased insurance with no underwriting to cover a portion of their LTSS needs. Inherent flaws in the design and financing of CLASS were evident to some even before its passage, despite the surprisingly favorable score and evaluation that the Congressional Budget Office gave the proposed program (Warshawsky 2009). These flaws were further demonstrated through several congressional hearings after its passage. The Obama administration never implemented the CLASS program, and Congress repealed it.

As part of the political compromise that formed the budget and tax legislation passed at the end of 2012, which included the repeal of CLASS, Congress created the Commission on Long-Term Care. Established in June 2013, the commission was charged with creating a plan to address the nation's challenges with delivering and financing LTSS. The due date of the commission's report was September 30, 2013, and this date was met. The chair of the commission was Bruce Chernof, head of the SCAN Foundation, and the vice-chair was Mark Warshawsky, then with Towers Watson.

The commission coalesced around many recommendations to improve service delivery and the LTSS workforce and agreed on the need for a comprehensive financing solution emphasizing insurance, with public and private sources of funds as well as assistance to the poor. However, it was split on the extent of the role of the government. Some commission members wanted to create a full Medicare-like social insurance program for LTSS, with a small optional carve-out for private long-term-care insurance (LTCI). Others were in favor of a federal catastrophic insurance program to cover the back end of the LTSS risk. And still others wanted most elderly Americans to rely mainly on private resources and insurance, with Medicaid as a fallback for the poor. Although some members of the commission emphasized the lack of retirement savings among older Americans, others believed that private resources are available on a fairly widespread basis or could be forthcoming. The latter, the self-identified conservative group, wanted to further encourage private insurance solutions and private funding sources for LTSS, through incentives and penalties and through strict enforcement of Medicaid eligibility and repayment rules. They thought that the current Medicaid incentive to avoid the purchase of LTCI (Brown and Finkelstein 2008) could be cut back (1) by stricter enforcement of the current rules on eligibility and asset recovery from estates of deceased beneficiaries and (2) by making the rules stricter to increase the amount and types of assets (especially retirement accounts) as countable for eligibility purposes. The conservative group also thought that, despite somewhat poor current conditions, the market for LTCI and the nature of LTCI products could be improved greatly through more regulatory flexibility and product innovation.

The Urban Institute DYNASIM3 Model

Despite the split opinions of members of the commission (perhaps because of it), there continues to be a strong current of demand in certain political circles for the federal government to provide LTSS insurance directly, even on the basis of social insurance. Concern about cost has created a demand for models that can score proposals for insurance programs. Melissa M. Favreault, Howard Gleckman, and Richard W. Johnson, researchers at the Urban Institute, developed an elaborate dynamic microsimulation model, DYNASIM3.[1] The role of DYNASIM3 was to analyze policy proposals for financing LTSS, with an emphasis on new public programs.[2] The essence of the researchers' results has been published in an article in *Health Affairs* (Favreault, Gleckman, and Johnson 2015).

In particular, Favreault, Gleckman, and Johnson (2015) analyze three new insurance options: (1) a program with a front-end benefit that begins after a 90-day waiting period and covers a maximum of two years of need, (2) a catastrophic-only or back-end program that begins after a waiting period of two years but provides a lifetime benefit thereafter, and (3) a comprehensive program that begins after a 90-day waiting period and provides a lifetime benefit (see also Favreault and Johnson 2015). Each option is modeled both as voluntary insurance and as a universal mandatory program for workers. For the voluntary programs, the researchers included subsidized and unsubsidized versions. The Bipartisan Policy Center (2016) in its project on long-term-care financing uses the DYNASIM3 model, in particular, to score the cost to the federal government of a catastrophic insurance program.

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[1] DYNASIM3 was funded by the US Department of Health and Human Services, particularly the Assistant Secretary for Planning and Evaluation; the SCAN Foundation; AARP Inc.; and LeadingAge (an organization of nonprofit long-term-care providers).

[2] Several of the papers cited here, including all those supported by the SCAN Foundation, may be found at http://www.thescanfoundation.org/ltc-financing-initiative.

Actually, Sometimes, Two Models

The model is quite complex; it is based on multiple sources of data and contains hundreds of assumptions. Although the supporting written material is voluminous, that material is incomplete and sometimes even opaque in key areas and assumptions. It would be impossible for others to replicate the results found.

According to an appendix to the *Health Affairs* article (Favreault, Gleckman, and Johnson 2015), to evaluate the voluntary front- and back-end programs, for starting values the researchers use premium prices based on an actuarial model developed by the consulting firm, Milliman (Giese and Schmitz 2015). The researchers say that these premium estimates were made on the basis of output from the DYNASIM3 model and the Milliman model; they do not specify how the models are combined. The researchers then “modestly adjust” these premium estimates “to increase consistency” with the DYNASIM3 projections; they do not explain the details of this adjustment or the justification for it (Favreault, Gleckman, and Johnson 2015, appendix, 12). The researchers say that there are “necessarily” different assumptions between the two models about the distribution of risk of needing LTSS, about transactions costs, and so on. Again, the researchers do not give the details of the different assumptions or the justification for them. For developing all other premiums, in particular for the mandatory and comprehensive programs, the researchers use DYNASIM3 alone.

The choice to use the Milliman hybrid model in some areas and DYNASIM3 alone in others is perplexing because it is not clear why some financing programs should be assessed using one model alone and others using a hybrid model. An alternative, and more conventional, modeling choice would have been to rely on one model consistently across policy experiments. If, for example, DYNASIM3 had been used to model the voluntary purchase of insurance, then the researchers could have focused on the population who they thought (or could demonstrate) would buy their insurance product on a voluntary basis. Using the currently insured population, even adjusted, would be difficult because it is a population subject to marketing, underwriting, particular product designs, and so on, and will not necessarily correspond with the population that will buy the researchers' particular proposed insurance product. It is even possible that the results in the research paper that generally favor mandatory and comprehensive programs over voluntary and partial programs derive entirely from the use of the DYNASIM3 model, as opposed to the Milliman hybrid model. As I will show, the DYNASIM3 model contains many unreasonable assumptions, most of which seem to underestimate the proportion of the older population that is disabled, the incidence of significant disability, and the duration of disability and paid care. Hence, the DYNASIM3 model undervalues the estimated costs of the evaluated programs that finance LTSS.

Surprisingly Low Projection of Future Paid Care for LTSS

Another supporting document (Favreault and Dey 2015), this one available on the US Department of Health and Human Services website, gives some of the basic assumptions and results of the DYNASIM3 model about the risk of needing care and about associated costs now and in the future. The Urban Institute's researchers say that the model can predict what percentage of older individuals will develop a disability, have LTSS needs, and use paid LTSS; how much they will use, and for how long; how much care costs; and how LTSS care is currently financed. The document gives both averages and distributions. The focus is on disabilities that meet the criteria set in the Health Insurance Portability and Accountability Act (HIPAA). For instance, one criterion is the need for assistance with at least two activities of daily living, or ADLs (e.g., toileting, bathing, and eating), where the need is expected to last at least 90 days. Another criterion is the need for substantial supervision to manage health and safety threats to an individual with severe cognitive impairment. In other words, the level of need, most of it presumably serviced through paid care, is quite high in HIPAA-eligible conditions because the extent of disability is quite substantial, continual, and ongoing. The Urban Institute researchers say that the data underlying the DYNASIM3 model in the areas of health, disability, LTSS use, and LTCI coverage come from the Health and Retirement Study (HRS 2012).

Favreault and Dey (2015) present projections of the number of persons age 65 and older, including the number meeting HIPAA disability criteria, from 2015 to 2065. They say that the number of individuals with HIPAA-level disabilities will increase from "6.3 million to almost 15.7 million" (Favreault and Dey 2015, 3). Yet figure 1 of the study shows that the proportion of the population age 65 and older that has HIPAA-level disabilities hardly changes. It increases from 6.3 million of about 48 million in 2015 (13.1 percent) to 15.7 million of about 98 million in 2065 (16.0 percent)—a relatively small increase.[3] The small increase is surprising because of the universally accepted projection that the elderly population will age considerably over this long horizon, given declining mortality rates and the movement of the large baby boom generation into retirement. Presumably the aging elderly population would become proportionately more and more subject to disability. (The probability of being disabled in a year, whatever the definition of disability, increases significantly with age.)

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[3] In the version of figure 1 on the US Department of Health and Human Services website as of February 20, 2016, when I first examined the model-supporting document, the total elderly population indicated was 39 million in 2015 and 92 million in 2065—clear errors. In a subsequent conversation between Mark Warshawsky and Melissa Favreault, Favreault acknowledged the error in the figure and said it would be corrected, but she denied that the error had been perpetuated to the model itself. It is surprising that this error was not caught by others, especially the peer reviewers of the *Health Affairs* article (Favreault, Gleckman, and Johnson 2015).

According to the 2016 Social Security Trustees' report (Board of Trustees 2016), in total, 6.2 million people were age 85 and older in 2015, comprising 12.9 percent of the population age 65 and older, and in 2065, 19.0 million people will be age 85 and older, accounting for 19.7 percent of the 65-plus population. The significant aging of the elderly population over this long horizon would seem to indicate that the slow and small increase in the projected proportion of people with HIPAA disabilities in the elderly population, as produced by the DYNASIM3 model, is an underestimate. The researchers state their assumption that projected disability rates by age will fall over time as mortality rates decline (no specific rate of decline is given). Although some decline in disability rates seems reasonable given health improvements among the elderly, the researchers' calculations are surprisingly low, given that these disability rates must be multiplied by the rapidly increasing number of very aged people. Moreover, assuming rapidly declining rates of disability over time is not conservative, as would be appropriate for a model used to determine the cost of public policy proposals; it would be very good to see the sensitivity of results to this key assumption. In particular, the Urban Institute's researchers should also report results on the basis of assuming no morbidity improvement.

But this may not be the most significant questionable assumption in the DYNASIM3 model. The researchers claim, with no indication of source or empirical basis, that there is a large gap between the need for LTSS and the use of paid LTSS. Favreault and Dey (2015) state the following in the HHS supporting document:

> Table 1 displays expected LTSS needs from age 65 to death. It presents life expectancy and then the mean and distribution of the duration of disability for those turning 65 in 2015–2019. The typical person who is alive at age 65 can expected [*sic*] to live another 20.9 years. Fifty-two percent can anticipate having at least some needs for LTSS; 19 percent are expected to have needs that last less than a year, and about 14 percent are expected to have needs that extend beyond five years. . . .

> The figures for average LTSS needs mask substantial variation by subpopulation. The average duration of disability is much higher for women than for men—about 2.5 years for all women as compared to 1.5 year for all men. . . .
>
> Table 2 examines use of paid LTSS provided for a disability from age 65 onward measured in days. Of the average two years that an older adult will have a disability, they will receive paid care for about one year, and informal caregivers only, such as family and friends, will make up the difference. . . .
>
> While on average, individuals will need one year of paid LTSS, 48 percent of individuals will not use paid, formal LTSS at all. . . . Among those who need paid LTSS services, about half will need less than a year, and a little more than 10 percent will need five years or more.

The researchers are assuming, or perhaps estimating, that fully one-half of LTSS care at the severe HIPAA level of disability is covered through informal sources. The researchers need to support and fully document such an important and nonintuitive assertion. Such a strong assumption is inconsistent with results in the published literature.

Although the researchers indicate that there would be an increase in use (that is, more spending on new services—presumably mostly replacing uncompensated caregivers) when new financing programs are introduced, this increase, even for the mandatory comprehensive program, is indicated to be only about one-third of all program spending. That amount is considerably less than one-half of needed care that they claim is not now covered by formal paid care. It does not seem credible to assume that, once covered by insurance, anyone in a comprehensive program would not simply demand and get what is available under the rules of the program, given the significant need. Even for incomplete “pool of money” private insurance with a somewhat restrictive service reimbursement structure, Milliman assumes that up to 90 percent of benefits are used. For a comprehensive public cash-benefit social insurance program applied across the entire population (not a welfare program subject to some stigma, applying just to the poor population), it is much more reasonable to assume that close to 100 percent of benefits will be used. Indeed, this is particularly true now that assisted-living facilities, which are often preferred over nursing homes, are becoming more prevalent.

Going even further, given that the benefits from these proposed social insurance programs are cash and may be used for many different purposes, and given that the programs will be administered by the government either directly or indirectly through regulations, there will be strong political pressure to interpret loosely the HIPAA eligibility triggers, so that costs will likely be higher than 100 percent of "scheduled" benefits. Spillman, Murtaugh, and Warshawsky (2001) show that "ADL creep," or the tendency to "up-code" conditions to qualify for insurance payment, significantly increases costs. Brown and Warshawsky (2013) similarly show that using the vague term "having difficulty" rather than "requires assistance" significantly increases incidence and duration.

Key Model Assumptions: Inconsistent with Those in the Professional Literature

The current life expectancy at age 65, according to DYNASIM, is higher than that stated in the Social Security Trustees' report (Board of Trustees 2016). DYNASIM's life-expectancy figures are 19.6 more years for men and 22.2 more years for women who are age 65 in 2015; the trustees' figures, on a cohort basis, are 19.1 more years for men and 21.5 more years for women who are age 65 in 2015. So it seems that the DYNASIM3 model assumes healthier, longer-lived individuals than those in the current population.

The Urban Institute researchers' estimates of the incidence and duration of LTSS needs are on the low side compared to other results in the literature for similar measures of lifetime disability—that is, HIPAA criteria to be eligible for benefits. Using data from the National Long-Term Care Survey, Stallard (2011) finds that the average disability duration is 2.24

years—1.50 years for men and 2.83 years for women. Stallard also finds that, on average, 1.53 years were spent in paid nursing homes and home health care—0.89 years for men and 2.04 years for women. This latter result indicates that about two-thirds of HIPAA-level disability is paid care, even without considering assisted living, which seems to be a facially more reasonable finding than the Urban Institute authors' assumption that only one-half of care for significant disability is paid.[4]

In an earlier microsimulation model, based on different data sources, Kemper, Komisar, and Alecxih (2005–2006) also find incidence and duration of disability to be significantly higher than the Urban Institute model found, although their definition of disability is broader than that of HIPAA. In particular, Kemper, Komisar, and Alecxih report that 69 percent of the population turning age 65 in 2005 will need LTSS (79 percent of women and 58 percent of men) for, on average, 3 years (women for 3.7 years and men for 2.2 years). About 20 percent of this population will need care for more than 5 years. If a definition of disability more restrictive than the HIPAA definition is used instead, Kemper, Komisar, and Alecxih find that 61 percent of this population will need LTSS at some time in their lives, for an average of 2.2 years. Presumably, using the HIPAA definition would produce results somewhere between those two figures, but significantly larger in any case than the assumptions used in the DYNASIM3 model. For paid care, Kemper, Komisar, and Alecxih report an average duration of 1.6 years under their somewhat looser definition of disability.

According to Murtaugh and Spillman (2012), using data from the 1993 National Mortality Followback Survey, there are 1.7 expected years of HIPAA-level disability and 1.3

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[4] The Urban Institute researchers characterize the Stallard (2011) article as based on data from "a few decades ago." This assessment is exaggerated and misleading; the data underlying Stallard's work are from 1984 to 1994, just a few years before the date of much of the data underlying DYNASIM.

years in paid home healthcare and nursing home care for people age 65 and older. Again, these results, taken together, indicate that the DYNASIM3 model is using prevalence and duration statistics for disability and paid care that are significantly lower and shorter, respectively, than those statistics found in the mainstream of the professional literature.[5]

Using data from the 1986 National Mortality Followback Survey, Murtaugh, Spillman, and Warshawsky (2001) find that the disabled percentage of the population age 65 and older is 68.5 percent, and the expected duration of disability, conditional on being disabled, is 2.2 years—1.6 years for men and 2.6 years for women. So the incidence of disability is higher than stated by the Urban Institute researchers. Using data from the Health and Retirement Study (HRS), Brown and Warshawsky (2013) find a slightly lower disability incidence (42 percent for men and 55 percent for women) than the Urban Institute researchers, but Brown and Warshawsky's statistics are for a somewhat healthier population, those who would not immediately be rejected by underwriting for purchase of an LTCI policy. The average conditional disability duration found by Brown and Warshawsky, however, is similar to that of Murtaugh, Spillman, and Warshawsky (2001)—1.5 years for men and 2.6 years for women. Brown and Warshawsky use these statistics—with no reduction for unpaid care—to price various insurance products. Using the Brown and Warshawsky model, based on the HRS data for the whole population (men and women combined, including those already disabled), they find (unpublished) that the rate of severe disability incidence is 49.6 percent and that the simple population average duration is 1.5 years.[6] It should be noted, though, that these durations should

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[5] Sometimes the Urban Institute researchers will justify their assumptions, where the empirical work is ambiguous, by referring to the apparent concurrence among members of a technical advisory panel. This process is not well documented. Moreover, most of the members of this panel are not independent; they work either for the Urban Institute directly or for the funders of the project directly, or they are supported by the funders for other projects.

[6] My thanks to Jason Brown, an economist at the Treasury Department, for doing these calculations.

be increased by 0.2 or 0.3 years because the lengths reported do not include the 90- or 120-day initial benefit waiting period, whereas in the Urban Institute figures, durations apparently are computed at the start of disability.

The Urban Institute researchers report that the current sources of payment for LTSS as found in DYNASIM3 are quite different than those found in current aggregate statistics reported by the Commission on Long-Term Care (2013) and by the Congressional Budget Office (CBO) (2013). In 2011, according to the CBO, paid LTSS comprised $68 billion by Medicare, $60 billion by Medicaid, $39 billion out of pocket, $12 billion by private insurance, and $12 billion by other sources (such as private charitable organizations or the federal government through the Veterans Health Administration). CBO also reports that, according to their tabulations of the HRS, about 13 percent of the population age 65 and older has LTCI. Warshawsky and Zohrabyan (2016) find that 15 percent of retired households with heads ages 62–74 in 2012 had LTCI, but the Urban Institute researchers say that in their baseline, only 8.6 percent of the population is covered by LTCI. For spending, the Urban Institute researchers report that according to DYNASIM3, 44.8 percent of LTSS expenditures is from public sources (9.9 percent Medicare, 34.3 percent Medicaid, and 0.6 percent other) and 55.0 percent is from private sources (52.3 percent out of pocket and 2.7 percent private insurance). Even after accounting for some conceptual controversy about the exact role of Medicare in paying for LTSS, the proportion covered by out-of-pocket sources is significantly lower for the CBO than for the Urban Institute's estimate. The Urban Institute researchers need to explain completely this large difference because the CBO figures are not model estimates but rather actual spending as reported in the national health accounts.[7] These CBO data call into question the reported findings of the Urban Institute researchers on the effect of the various new programs on Medicaid spending.

Policy Analysis Bias

Finally, there seems to be a policy analysis bias inherent in the Urban Institute DYNASIM3 model. New social insurance schemes are extensively investigated, but recommendations to improve incentives for private insurance and limit Medicaid insurance are not. Although it is hard to tell with certainty, it does not seem that the DYNASIM3 model would be capable of any investigations of the recommendations of the aforementioned conservative group of the Commission on Long-Term Care.

These social insurance proposals for LTSS are a partial replacement for Medicaid but extend all the way up the income and wealth distribution, and they substitute paid care for unpaid care (as discussed above, the significance and extent of this substitution is unclear). LaPlante et al. (2004) show little unmet need for LTSS care, so these proposals mainly serve to redistribute resources, although there may be some increase in overall LTSS spending because of induced demand and perhaps increased prices. The redistribution is from the federal government to state governments (as the social insurance program partially replaces Medicaid),

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[7] An explanation given by the researchers for their high out-of-pocket share of LTSS spending is that they include the housing component of residential care (e.g., assisted-living facilities) in their estimates. Most researchers exclude this component because these facilities have been high end and discretionary for the well-to-do, although some newer facilities are more modest and more affordable for the middle-class elderly population. Even so, it is unclear how much HIPAA-level care is provided in these facilities, which are not really equipped to do, or licensed for, nursing or continual custodial care. Moreover, room and board in assisted living facilities is apparently not tax deductible and therefore, to be consistent with federal tax policy, should not be included in these calculations. More fundamentally, this inclusion is an illogical slippery slope. Why not also include cable, phone, and entertainment expenses for residential care (these are essential services, too, like room and board), and why not also include Social Security and government pensions as sources of payments?

from the higher-income group (who are paying the majority of the new taxes) to the upper-middle-income group (who get most of the new insurance benefits; the poor and lower-middle-income groups are covered by Medicaid also and otherwise), from young workers to old, and to the adult children providing unpaid care and to newly created LTSS workers. The main benefit seems to be for the adult children legatees of the upper-middle-income elderly individuals; these elderly individuals would otherwise use their assets or buy private insurance to pay for their LTSS care.

Creating new redistributive social insurance programs in this area is not a sensible or urgent policy, especially considering problems in the current structure and administration of Medicaid and its growing fiscal burden on states and the federal government. Moreover, these social insurance proposals suffer from many of the same problems that CLASS did: government administration of disability adjudication (a difficult and inefficient process, ripe for abuse, as evident from the Social Security disability insurance program), unclear coordination with Medicaid and private insurance (because the benefits of the social insurance program are incomplete), and the impossibility of the federal government to fund in advance the accruing benefits under this program, thereby causing considerable budget mischief.

Conclusions

The unfortunate experience with CLASS could have been prevented by a more reasonable score of the proposed program by the CBO, like the one produced by the actuary of the Centers for Medicaid and Medicare Services at the time. Scoring based on widely accepted, transparent, robust, and conservative results and assumptions is needed in the LTSS area, given the political demand for government action either to expand or to restrict programs. Unfortunately, despite the efforts of the Urban Institute, its model, as presently constituted, cannot serve this purpose.

References

Bipartisan Policy Center. 2016. *Initial Recommendations to Improve the Financing of Long-Term Care.* Washington, DC.

Board of Trustees of the Federal Old-Age and Survivors Insurance and Federal Disability Insurance Trust Funds. 2016. *Annual Report.* https://www.ssa.gov/OACT/TR/2016/tr2016.pdf.

Brown, Jason, and Mark Warshawsky. 2013. "The Life Care Annuity: A New Empirical Examination of an Insurance Innovation That Addresses Problems in the Markets for Life Annuities and Long-Term Care Insurance." *Journal of Risk and Insurance* 80 (3): 677–703.

Brown, Jeffrey R., and Amy Finkelstein. 2008. "The Interaction of Public and Private Insurance: Medicaid and the Long-Term Care Insurance Market." *American Economic Review* 98 (3): 1083–102.

Commission on Long-Term Care. 2013. *Report to the Congress.* Washington, DC: Government Printing Office.

Congressional Budget Office (CBO). 2013. *Rising Demand for Long-Term Services and Supports for Elderly People.* Washington, DC.

Favreault, Melissa M., and Judith Dey. 2015. *Long-Term Services and Supports for Older Americans: Risks and Financing*. Research brief, US Department of Health and Human Services, Assistant Secretary for Planning and Evaluation, Washington, DC. https://aspe.hhs.gov/basic-report/long-term-services-and-supports-older-americans-risks-and-financing-research-brief.

Favreault, Melissa M., and Richard W. Johnson. 2015. *Microsimulation Analysis of Financing Options for Long-Term Services and Supports*. Research report, Urban Institute, Washington, DC.

Favreault, Melissa M., Howard Gleckman, and Richard W. Johnson. 2015. "Financing Long-Term Services and Supports: Options Reflect Trade-Offs for Older Americans and Federal Spending." *Health Affairs* 34 (12): 2181–91. Appendix available at http://content.healthaffairs.org/content/early/2015/11/13/hlthaff.2015.1226/suppl/DC1.

Giese, Christopher J., and Allen J. Schmitz. 2015. *Premium Estimates for Policy Options to Finance Long-Term Services and Supports*. Milliman client report Brookfield, WI.

HRS (Health and Retirement Study). 2012. Public use dataset. Produced and distributed by the University of Michigan with funding from the National Institute on Aging (grant number NIA U01AG009740), Ann Arbor, MI.

Kemper, Peter, Harriet L. Komisar, and Lisa Alecxih. 2005–2006. “Long-Term Care over an Uncertain Future: What Can Current Retirees Expect?” *Inquiry* 42 (4): 335–50.

LaPlante, M., H. Kaye, T. Kang, and C. Harrington. 2004. “Unmet Need for Personal Assistance Services: Estimating the Shortfall in Hours of Help and Adverse Consequences.” *Journals of Gerontology* 59 (2): S98–S108.

Murtaugh, Christopher M., and Brenda C. Spillman. 2012. “Lifetime Risk of Chronic Disease, Disability and Long-Term Care.” Presentation for the 12th Annual Intercompany Long Term Care Insurance Conference, Las Vegas, NV.

Murtaugh, Christopher M., Brenda C. Spillman, and Mark J. Warshawsky. 2001. “In Sickness and in Health: An Annuity Approach to Financing Long-Term Care and Retirement Income.” *Journal of Risk and Insurance* 68 (2): 225–54.

Stallard, Eric. 2011. “Estimates of the Incidence, Prevalence, Duration, Intensity, and Cost of Chronic Disability among the U.S. Elderly.” *North American Actuarial Journal* 15 (1): 32–58.

Warshawsky, Mark J. 2009. “Will the ‘CLASS’ Program Succeed? Is It Sustainable?” *Willis Towers Watson Insider*, December.

Warshawsky, Mark J. and Tatevik Zohrabyan. 2016. “Retire on the House: The Use of Reverse Mortgages to Enhance Retirement Security.” Working paper, MIT Golub Center on Finance and Policy, Cambridge, MA, July 26.