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RESEARCH INSTITUTE FOR HOUSING AMERICA **SPECIAL REPORT**

Who Will Buy the Baby Boomers' Homes When They Leave Them?

Population Aging, Mortality, and the Future Housing Market

Gary V. Engelhardt
Syracuse University

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Special Report Prepared for
Mortgage Bankers Association

MORTGAGE BANKERS ASSOCIATION

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About the Author

Gary V. Engelhardt is Professor of Economics in the Maxwell School of Citizenship and Public Affairs at Syracuse University, and Faculty Associate in the Syracuse University Aging Studies Institute. He holds a B.A. in economics from Carleton College and a Ph.D. in economics from the Massachusetts Institute of Technology.

Dr. Engelhardt's specialties are in the economics of aging, household saving, pensions, Social Security, taxation, and housing markets. His current research focuses on three areas: the impact of the COVID-19 pandemic on housing markets; the impact of population aging on housing markets; and the evaluation of field experiments in household saving and financial behavior. He is an editor of the *Journal of Pension Economics and Finance*, and teaches graduate and undergraduate courses in public economics, applied econometrics, and program evaluation.

His work and commentary have been featured nationally, including in *The Wall Street Journal, Forbes, New York Times, Washington Post, Chicago Tribune, Los Angeles Times, USA Today, Yahoo News, Fox News, CNBC, MSNBC, C-SPAN*, National Public Radio's *Morning Edition*, and American Public Media's *Marketplace*.

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Executive Summary

America is growing older, driven by the Baby Boomers. Prior to the COVID-19 pandemic, Boomer homeowners numbered 32 million and represented almost 41% of all homeowners in 2019. The aging and eventual death of such a large population group may have an important impact on the future housing market, because listings by older homeowners are an important source of supply of existing homes for sale.

Indeed, some estimates suggest that one-quarter of current owner-occupied homes will come on the market by 2040, as older Americans transition out of owner-occupied housing and eventually die. The possibility that this floods the market and substantially depresses house price growth and new construction — a phenomenon termed the "Silver Tsunami" — has generated considerable interest in the mortgage and housing industries, as well as the popular press.

This report takes a deep dive into a vast array of data on housing, aging, and mortality to examine the extent to which this demographic shift may affect the demand and supply of homes for sale by "older Americans," defined throughout as individuals and households with heads who are 50 and older. This includes data over the last twenty years from the decennial censuses, American Community Survey (ACS), Health and Retirement Study (HRS), American Housing Survey (AHS), and the universe of deaths from the Center for Disease Control's *Vital Statistics* program, as well as projections of future population growth and mortality from the Social Security Administration (SSA) Office of the Chief Actuary.

There are a number of principal findings:

- In 2019, there were 2.6 million deaths of persons aged 50 and older. One million of these were renters. Of the 1.6 million decedents who lived in owner-occupied housing, a half million were the first-to-die spouse in a couple and transferred ownership to the surviving spouse. The remaining 1.1 million died as homeowners and bequeathed their homes. Therefore, the supply of homes for sale from the mortality of older Americans was 1.1 million units in 2019.

- The pre-pandemic total annual supply of homes for sale from older homeowners was 4.4 million units. This included units for sale from death and later life housing tenure transitions. This represented a substantial portion of annual existing homes for sale.

- The pre-pandemic total annual demand for homes for sale from older homeowners was 4.2 million units. About 20% of this demand comes as rental housing of what were formerly owner-occupied units.

- Based purely on changing demographics, over the next decade there is projected to be a modest amount of excess supply of homes for sale as older homeowners age and die — around a quarter million units annually.
- Beyond 2032, demographic change is more favorable to demand. This occurs because of compositional changes of the population toward the Millennials and general population growth, as well as the conversion of previously owner-occupied units to rental housing. This conversion will be an important margin on which the future housing market will adjust.
- Overall, housing supply and demand shifts from changing demographics are slow moving and highly predictable, which suggests that there will not be measurable effects on house price growth from population aging and mortality.
- Over the next decade, the excess supply of homes from demographic change will constitute a non-trivial share of current new housing starts and completions, which suggests that most of the adjustment to aging and mortality will be through a reduction in the growth of new housing and some softness in the rental market.

Introduction

America is growing older, driven by the Baby Boomers. Prior to the COVID-19 pandemic, Boomer homeowners numbered 32 million and represented almost 41% of all homeowners. The aging and eventual death of such a large population group may have an important impact on the future housing market, because listings by older homeowners are an important source of supply of existing homes for sale.

Indeed, some estimates suggest that one-quarter of current owner-occupied homes will come on the market by 2040, as older Americans transition out of owner-occupied housing and eventually die. The possibility that this floods the market and substantially depresses house price growth and new construction — a phenomenon termed the "Silver Tsunami" by Romem (2019) in an article for Zillow — has generated considerable interest in the mortgage and housing industries, as well as the popular press.

This report takes a deep dive into a vast array of data on housing, aging, and mortality to examine the extent to which this demographic shift may affect the demand and supply of homes for sale by "older Americans," defined throughout as individuals and households with heads who are 50 and older. This includes data over the last twenty years from the decennial censuses, American Community Survey (ACS), Health and Retirement Study (HRS), American Housing Survey (AHS), and the universe of deaths from the Center for Disease Control's *Vital Statistics* program, as well as projections of future population growth and mortality from the Social Security Administration (SSA) Office of the Chief Actuary.

There are a number of principal findings. In 2019, there were 2.6 million deaths of persons aged 50 and older. One million of these were renters. Of the 1.6 million decedents who lived in owner-occupied housing, a half million were the first-to-die spouse in a couple and transferred ownership to the surviving spouse. The remaining 1.1 million died as homeowners and bequeathed their homes. Therefore, the supply of homes for sale from the mortality of older Americans was 1.1 million units in 2019.

The pre-pandemic total annual supply of homes for sale from older homeowners was 4.4 million units. This included units for sale from death and later life housing tenure transitions. This represented a substantial portion of annual existing homes for sale. In contrast, the pre-pandemic annual demand for homes for sale from older homeowners was 4.2 million units. About 20% of this demand comes as rental housing of what were formerly owner-occupied units.

Therefore, based purely on changing demographics, over the next decade there is projected to be a modest amount of excess supply of homes for sale as older homeowners age and die — around a quarter million units annually. Beyond 2032, demographic change is more favorable to demand. This occurs because of compositional changes of the population toward the Millennials and general population growth, as well as the conversion of previously owner-occupied units to rental housing. This conversion will be an important margin on which the future housing market will adjust.

Overall, housing supply and demand shifts from changing demographics are slow moving and highly predictable, which suggests that there will not be measurable effects on house price growth from population aging and mortality. Over the next decade, the excess supply of homes from demographic change will constitute a non-trivial share of current new housing starts and completions, which suggests that most of the adjustment to aging and mortality will be through a reduction in the growth of new housing and some softness in the rental market.

The report is organized as follows. Section 1 provides background on demographic change and homeownership. Section 2 uses *Vital Statistics* data to describe trends in population mortality. Then the analysis pivots to the HRS and uses data from its exit interviews in Section 3 to calculate the volume of homes supplied to the market from the death of older homeowners. Data from the HRS and SSA are used in Section 4 to forecast the supply of homes to the market up through 2060 from population aging and mortality. Section 5 presents estimates of the demand by households of all ages for homes for sale by older homeowners, based on data from the AHS. These demand patterns and SSA data are then used to project future demand. The report concludes with the calculation of excess supply, discussion of housing-market implications, caveats, and directions for further study.

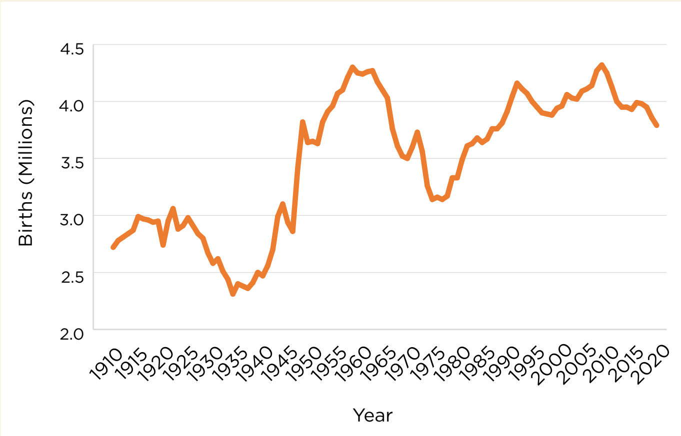
1. Background on Demographic Change and Homeownership

There has been considerable interest in the mortgage and housing industries, as well as the popular press, in the challenges of population aging for the housing market. Prior to the COVID-19 pandemic, this included, among others, concerns about retirement income security and affordability, the market for financial products like reverse mortgages (Mayer and Moulton, 2020), home safety and accessibility (Engelhardt, Eriksen, and Greenhalgh-Stanley, 2015), and aging in place and community.

While COVID has brought short-run market considerations into focus, the population will continue to age, no matter the trajectory of the pandemic. Consequently, the analysis in this report is necessarily long-run in nature. In addition, due to the unique mortality experience in the COVID-19 pandemic in 2020–21, throughout much of the analysis, historic data will be presented up through 2019, the last calendar year prior to the pandemic.

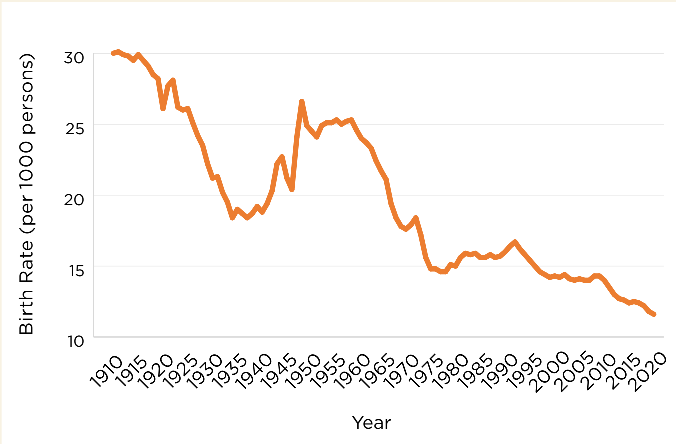
To set the stage, Figure 1A shows the aggregate annual number of births in millions for 1909–2020. These data come from the *Vital Statistics* program, administered by the National Center for Health Statistics of the U.S. Center for Disease Control (CDC). They trace out the historic evolution of fertility that encompasses the Baby Boom. In the analysis, sometimes the focus will be on the aggregate number of births and deaths as a measured of the absolute

Figure 1A. **Aggregate Annual Number of Births, 1909–2020**



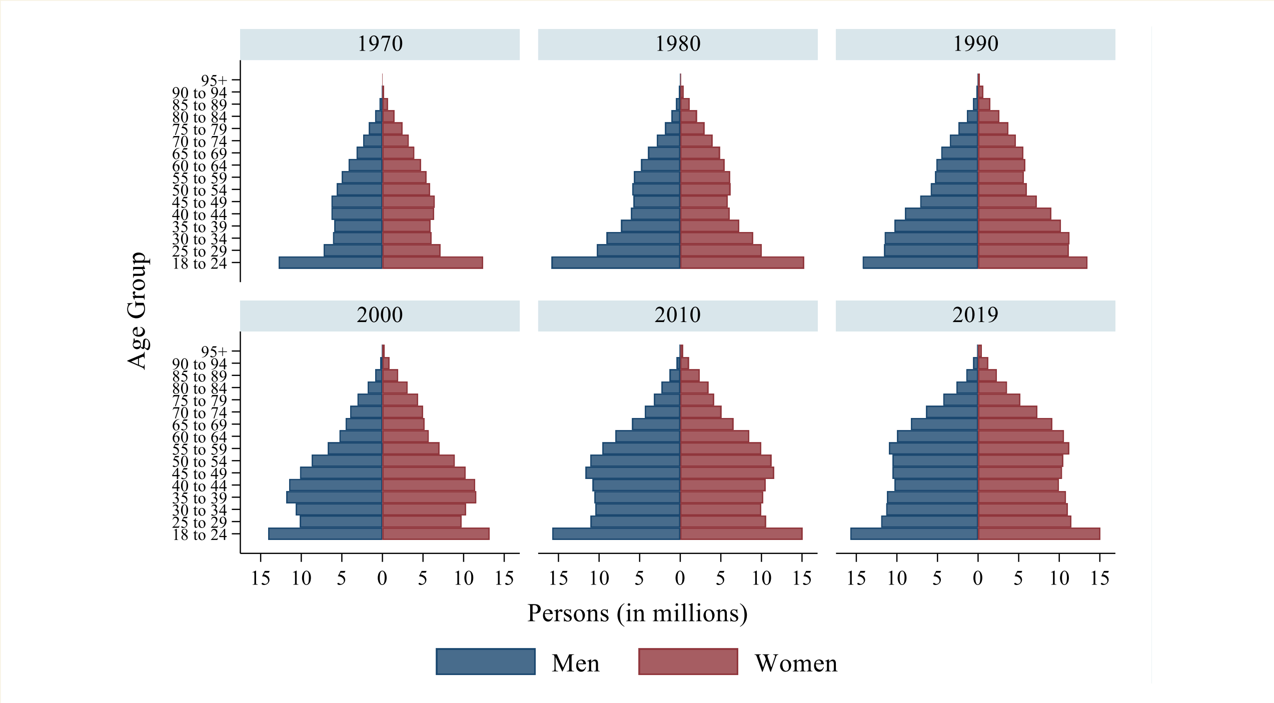
Source: *Vital Statistics*

Figure 1B. **Aggregate Annual Birth Rate, 1909–2020**



Source: *Vital Statistics*

Figure 2. **U.S. Population by Age Group, Sex and Year**



Source: Decennial Census for 1970–2010; American Community Survey for 2019

size of the population (and later in the analysis, housing) flows, and other times scaled by population as birth and death rates, respectively.

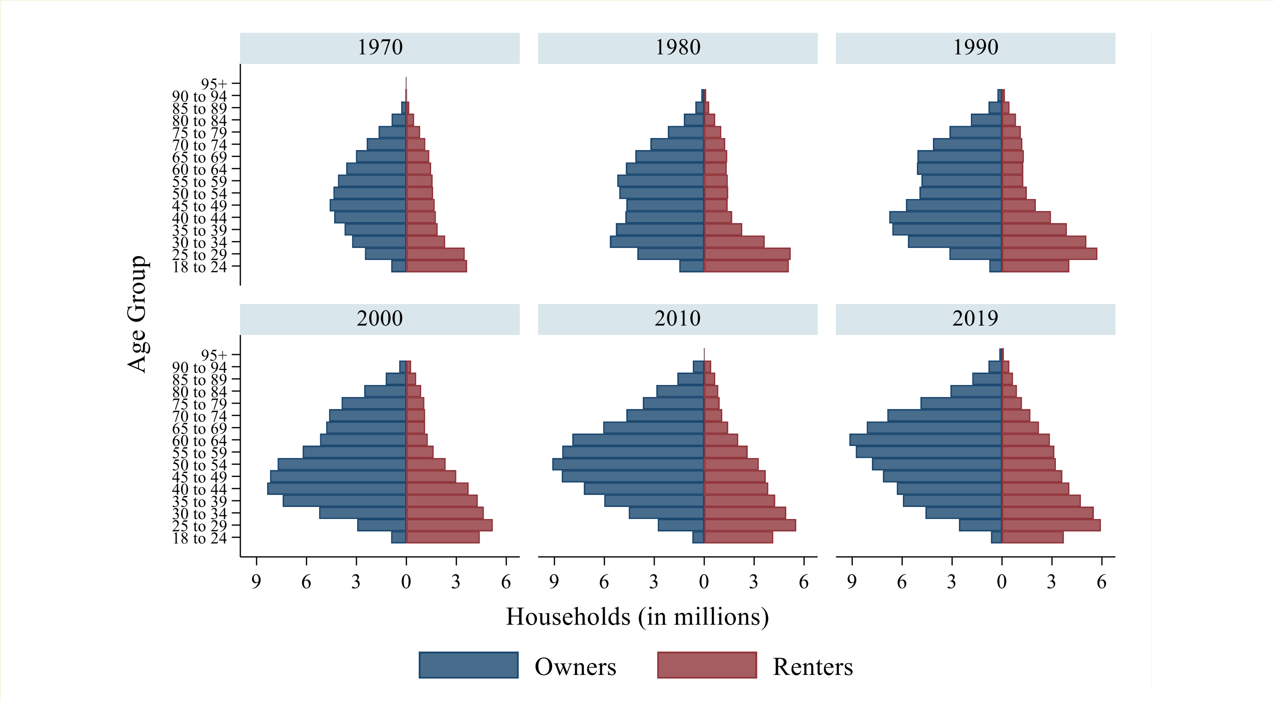
From the early 1900s until the late 1930s, the aggregate number of births fell. In 1940, annual births were just over 2.5 million. By the last year of the war in 1945, there were 3.7 million births. Demographers have adopted 1946 to signify the commencement of the Baby Boom. Children born then (roughly speaking) would have been conceived in the second through fourth quarters of 1945, or the first quarter of 1946. Starting then, births rose dramatically to an annual average of around 4.3 million in the 1950s. Births fell in the early 1960s, with 1964 conventionally defined as the last year of the boom.

There are two notable spikes in the figure. The first occurred in 1943, associated with an increase of 115,000 births (relative to 1942). These reflected conceptions in 1942, the time of large deployments of servicemen in World War II. The second occurred in 1947 and reflected war's end and the return of troops from overseas. Births were 950,000 higher (relative to 1945). Figure 1B shows the time-series of the *birthrate*, the number of births per 1,000 persons in the population. These spikes are even more pronounced.

Figure 2 illustrates the procession of the Baby Boom through the population age distribution. It shows population pyramids that are 10 years apart from 1970 through 2019. The data for 1970, 1980, 1990, 2000, and 2010 are from the decennial census; the data for 2019 come from the ACS. The vertical axis in each panel measures the age group, in intervals that are 5 years of age wide. The horizontal axis measures the number of individuals in millions in that group, with blue bars for men (read leftward from 0), and red for women (read rightward from 0). The leading edge of the Baby Boom appeared as 18-to-24 year olds in 1970. By 1990, the Boomers were 44 and under and occupied the prime first-time home-buying years. They pushed through the population age distribution from 2000 to the present. Currently, they are age 58 to 76 — older workers or comparatively young retirees.

The Baby Bust is apparent as well. Also known as Generation X, demographers have identified these as individuals born 1965–1980. From Figure 1B, the birth rate in this window was dramatically lower than in the Baby Boom, as well as the period prior to World War II. The smaller size of Generation X is reflected in the inversion of the population pyramid starting in 2000. This was attenuated with the emergence of the Millennials, the children of the Boomers, and eventually reversed in 2010 and 2019, when the Millennials appeared as young adults.

Figure 3. Housing Tenure by Age Group and Year



Source: Decennial Census for 1970–2010; American Community Survey for 2019

As is well known, the Baby Boom, by its sheer size, has had a profound impact on the housing market at every stage of the life-course. Figure 3 pivots from individuals to households. It shows the impact of the Baby Boom on homeownership via a parallel set of pyramids for housing tenure status. The vertical axis in each panel measures the age group, in intervals that are 5 years of age wide. Age refers to the age of the household head. The horizontal axis measures the number of households (in millions) in that housing tenure group, with blue bars for homeowners (read leftward from 0), and red for renters (read rightward from 0).[1] The data for 1970, 1980, 1990, 2000, and 2010 come from the decennial census; the data for 2019 are from the ACS. The leading edge of the Baby Boom appeared as 18-to-24 year olds in 1970. From 1980–2000, the movement of the Boomers into the ranks of homeowners was very clear, in both sheer numbers and as a percentage of all homeowners. They pushed through the housing tenure age distribution from 2000 to the present. They are now 58–76 years old and are homeowners (or renters) toward the end of their careers, or comparatively young retirees having made (or making) housing decisions associated with retirement and labor force departures.

In contrast to population in Figure 2, there has been no noticeable ripple yet in homeownership in Figure 3 from the Millennials, a phenomenon well documented in industry and the media. These cohorts have been associated with substantial growth in the number of renter households in the housing market over time.

1. Households who do not own and do not pay cash rent are considered renters in this calculation.

2. Background on Population Mortality

The Baby Boomers eventually will die. Their housing will become available for others or other uses. To better understand how mortality affects the supply of houses for sale, this section begins by documenting the number, demographic composition, and cause and place of death for Americans 50 and older, who died in 2019, the last year before the pandemic. The data are from the universe of deaths from *Vital Statistics*.[2]

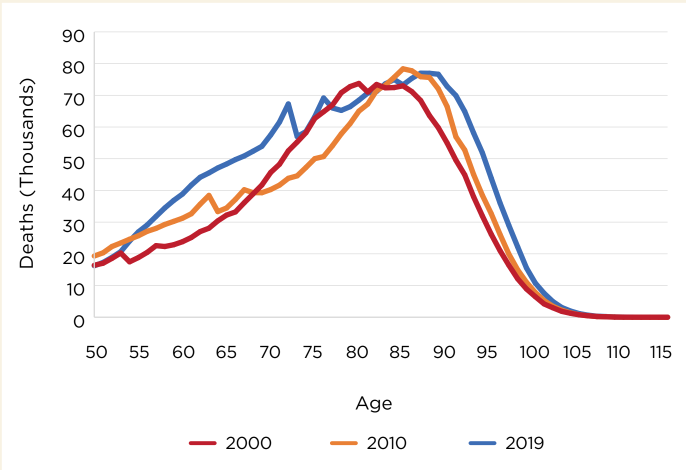
Figure 4 shows the age profile of mortality for selected years. The vertical axis measures the number of deaths (in thousands); the horizontal axis measures age at death by single year of age. The blue line shows the profile for 2019. It rises rapidly. The largest number of decedents were those who died in their late 80s. For example, almost 77,000 persons aged 88 died in 2019. After the late 80s, the number of deaths falls rapidly as the population size of the oldest old declines dramatically.

There are two notable spikes in the profile. The first is associated with individuals who died in 2019 at age 76, and, therefore, were born in 1943. Recall from Figures 1A and 1B, this was a year of unusually high births, which, of course, has lead to a higher count of deaths in future years, in this case, 2019.[3] Similarly, the second spike is associated with individuals who died in 2019 at age 72, and, therefore, were born in 1947, when births were unusually high.

The orange and red lines show the profile for 2010 and 2000, respectively. The combination of increased life expectancy and the Baby Boom is apparent. The right-hand portion of the profile has shifted rightward as individuals are living longer and dying at older ages in greater numbers. At the same time, the left-hand portion of the profile has shifted up, as Baby Boomers have aged, increased the 50 and older population, and have begun to pass away. Layered on top of these demographic trends have been other changes in mortality, such as the rise of deaths of despair among middle-aged and older individuals (Case and Deaton, 2020).

These *Vital Statistics* data are drawn from information on the U.S. Standard Certificate of Death. The certificate was last revised in 2003, and before that in 1989. It contains extensive information on the demographics of the decedent, location of residence, location of death, cause and place of

Figure 4. Total Deaths by Age for Persons 50 and Older for Selected Years

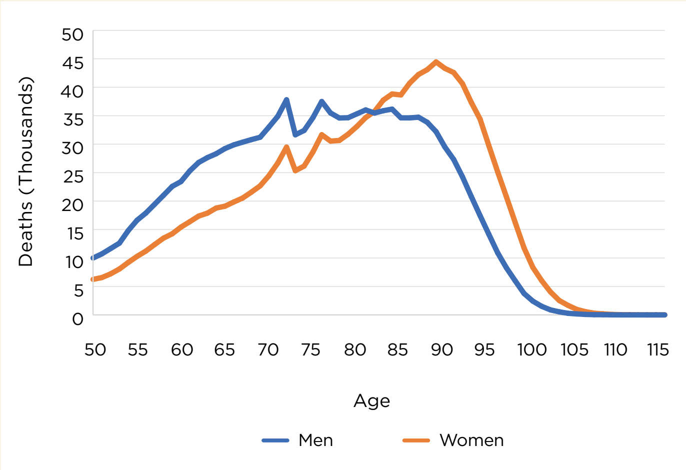


Source: *Vital Statistics*

2. Age 50 is where mortality risk starts to rise notably. For example, in 2019, 9.35% of the total of 2,861,523 deaths in the United States occurred among individuals who were under 50, and 1.55% of deaths were neo-natal. Therefore only 7.8% of U.S. deaths that year were under age 50 non-neonatal.

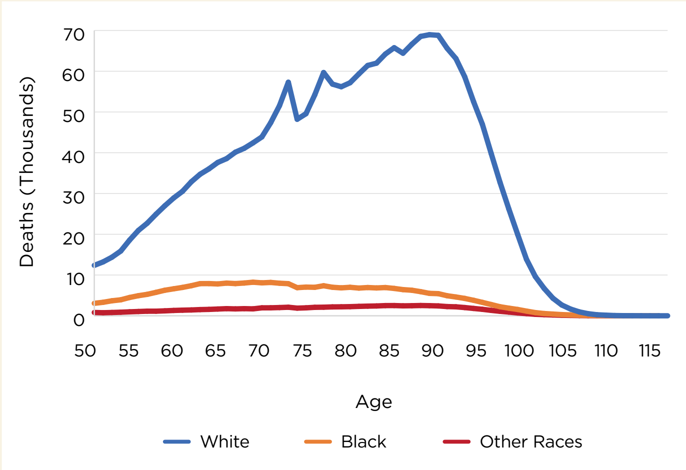
3. Although not shown, the spikes in the number of deaths in 2019 associated with birth years 1943 and 1947 appear in the age profile for other years as well, e.g., in years 2000–2019, and so are a constant feature across calendar years.

Figure 5. **Age Profile of Deaths by Sex for Persons 50 and Older in 2019**



Source: *Vital Statistics*

Figure 6. **Age Profile of Deaths by Race for Persons 50 and Older in 2019**



Source: *Vital Statistics*

death. A subset of this information has been assembled by the CDC into a series of public-use microdata files on mortality for the universe of all deaths. The files contain basic demographic, cause, and place of death information, but omit detailed location data and other potentially sensitive information from the certificates for confidentiality reasons.[4]

The next set of figures examine the cross-sectional demographic composition of decedents using the 2019 public-use microdata. Figure 5 breaks out the age profile of deaths by sex. The sex data are complete, meaning there is no missing information on sex on the certificates. The blue line shows the number of deaths at each age for men; the orange line shows the same for women. In general, men die earlier than women. Most of the decedents among the oldest old were women. Figure 6 shows the age profile of deaths in 2019 by race. Most decedents were white.

In contrast to sex and race, data on ethnicity, marital status, and education are not complete on the death certificates and may include missing values in the public-use files. Therefore, missing values for these categories were imputed as follows. Hispanic ethnicity, which had the smallest share of missings, was imputed first, based on the estimates of a logit model of ethnicity — the dependent variable was an indicator, 1 if Hispanic, 0 otherwise (so non-Hispanic as the base category) — as a function of the following covariates, all of which were not missing on the death certificate: age, sex, race, place of death, and cause of death. There are seven categories of place of death reported on the death certificate: hospital-inpatient, hospital-outpatient, hospital-dead on arrival, at home, in hospice, in a nursing home or long-term care facility, and all other places. The death certificate has detailed categories for cause of death, but were aggregated for the purposes of imputation into six categories: respiratory disease, cancer, diabetes, cardiovascular disease, diseases of the digestive tract, and a catch-all category of "all other" diseases. The model was estimated on the subset of death certificate data with complete information on ethnicity. Then the parameter estimates were used to probabilistically impute ethnicity for the subset of deaths with missing values for ethnicity.[5]

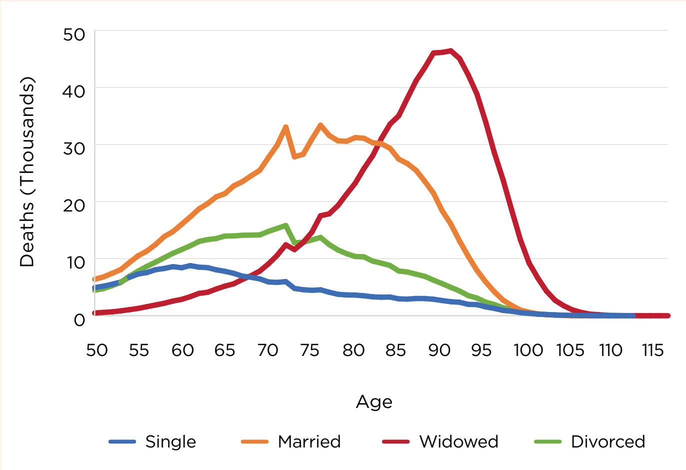
A similar procedure was used for missing values for marital status, which had the next smallest share of missings. Specifically, marital status was imputed based on the estimates of a multinomial logit model of marital status (0 if single, 1 if married, 2 if widowed, 3 if divorced; with single as the base category) as a function of the following covariates: age, sex, race, place of death, cause of death, and ethnicity. The model was estimated on the subset of deaths with complete information on marital status, and then the parameter estimates were used to probabilistically impute marital status for the subset of deaths with missing values for marital status.[6]

4. In principle, those more detailed data can be accessed via a restricted-access data authorization, but, in practice, that avenue was not pursued for this report.

5. Deaths for which ethnicity was not missing kept the reported ethnicity.

6. Marital status was imputed sequentially after ethnicity was imputed, so that there were complete data for ethnicity when imputing marital status.

Figure 7. **Age Profile of Deaths by Marital Status for Persons 50 and Older in 2019**



Source: *Vital Statistics*

Finally, this procedure was duplicated for education, which had the third largest share of missings. Specifically, education was imputed based on the estimates of a multinomial logit model of educational attainment group (0 if less than high school, 1 if high school, 2 if some college, 3 if a 4-year college degree, and 4 if more than college; with high school dropouts as the base category) as a function of age, sex, race, place of death, cause of death, ethnicity, and marital status. The model was estimated on the subset of deaths with complete information on education, and then educational attainment was imputed for the subset of deaths with missing values for education.[7]

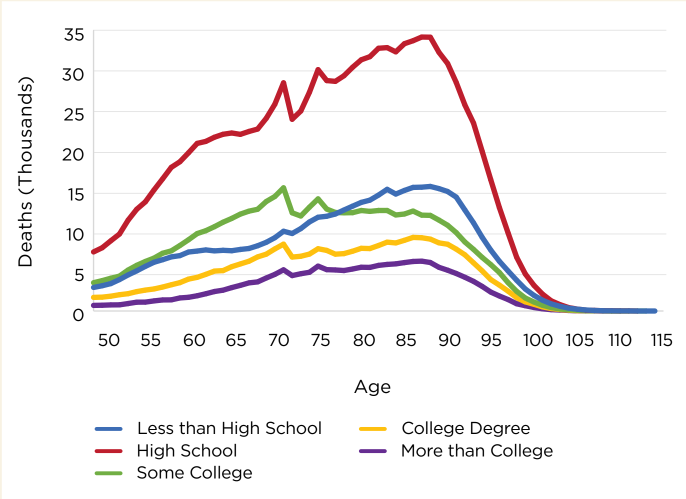
Figure 7 shows the age profile of mortality by marital status. Most decedents in 2019 at advanced ages were widowed and, therefore, the last to die of married couples. Younger decedents were more likely to be unmarried or the first to die in couples. Figure 8 shows the profile by education. It follows the same basic shape for those with less than high school, high school, college and above; the largest number of decedents were those with a high school degree. Those with some college, but no 4-year degree, were the exception; they died at somewhat younger ages.

How and where individuals died have important implications for how long older homeowners stay in their homes (Engelhardt and Eriksen, 2022). Some individuals died unexpectedly, for example by a stroke or heart attack. Homeowners who die in this manner will (definitionally speaking) die owning their homes. Other individuals died less unexpectedly, for example by cancer or degenerative diseases. Those with end-stage cancer may choose to die at home or stay in their homes as long as possible until moving to a hospice facility; those with degenerative diseases, such as Alzheimer's and other dementias, may transition out of their homes into assisted living, memory care, and nursing homes. In both cases, the decision to hold and own housing at death is closer to a conventional economic choice (by the person and/or extended family) than for those who succumb by sudden death. Therefore, both the cause and place of death, which are recorded on the death certificate, can provide clues as to how population mortality affects housing markets.

With this in mind, Figures 9 and 10 illustrate the age profile by cause and place of death. In Figure 9, the categories are defined as follows:

- **Respiratory** includes influenza, pneumonia, and chronic respiratory diseases.
- **Cancer** includes all malignant neoplasms, as well as leukemia.
- **Cardiovascular** includes sudden causes, such as acute heart attacks (myocardial infarction) and strokes, chronic conditions, such as congestive heart failure, and circulatory conditions.

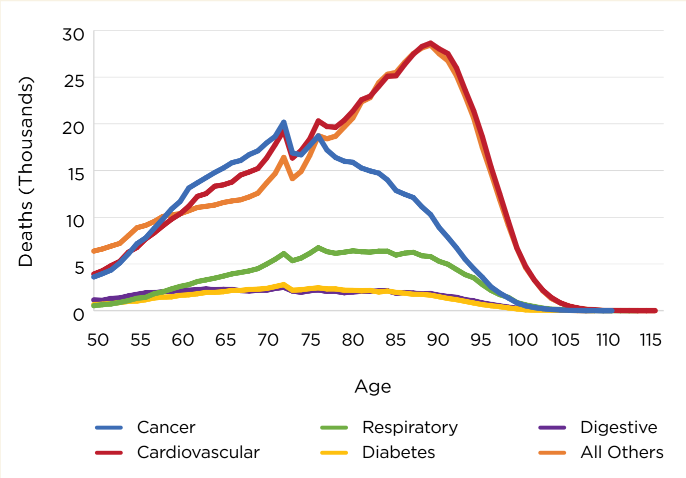
Figure 8. **Age Profile of Deaths by Education for Persons 50 and Older in 2019**



Source: *Vital Statistics*

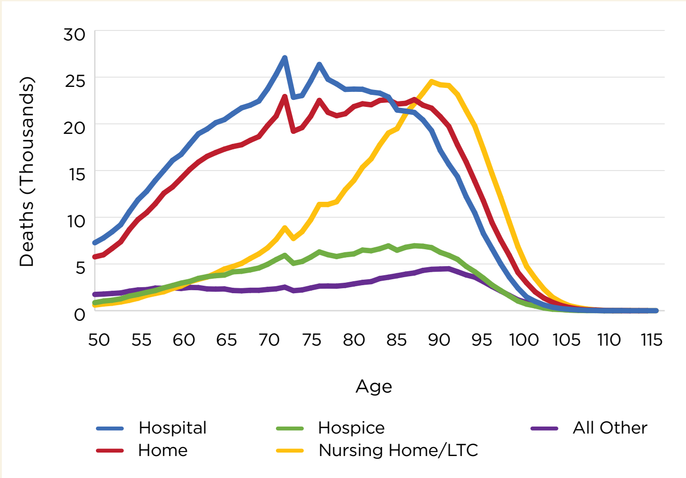
7. Education was imputed sequentially after ethnicity and marital status, respectively, were imputed, so that there were complete data for ethnicity and marital status when imputing education.

Figure 9. **Age Profile of Deaths by Cause of Death for Persons 50 and Older in 2019**



Source: *Vital Statistics*

Figure 10. **Age Profile of Deaths by Place of Death for Persons 50 and Older in 2019**



Source: *Vital Statistics*

- **Digestive** includes diseases of the digestive system, including the stomach, liver, gallbladder, kidney, and bladder.
- **Diabetes** includes endocrine, metabolic, and nutritional conditions.
- **All Other** a catch-all that includes accidental deaths, suicide, homicide, HIV, as well as deaths associated with dementia and Alzheimer's disease.

In 2019, cancer, cardiovascular disease, and all other were the leading causes of deaths. Within these groups, cancer deaths were more prevalent among younger decedents, whereas cardiovascular deaths were more prevalent among older decedents. Deaths associated with dementia and Alzheimer's disease were more prevalent among older decedents.[8]

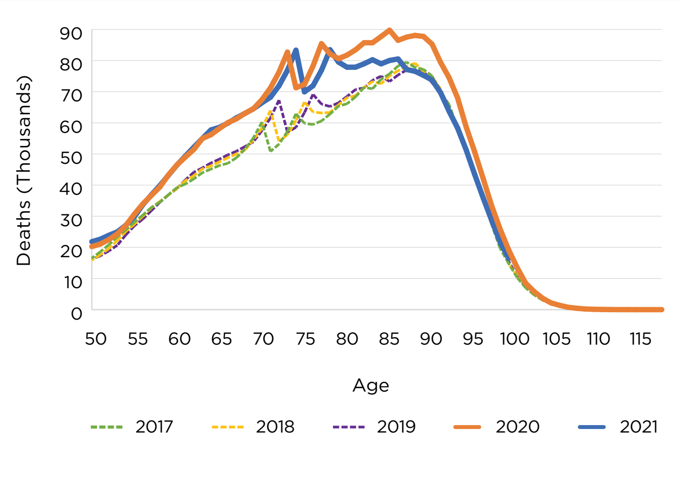
The term "place of death" on the certificate refers to the place where death was pronounced, and, in practice, refers to the type of facility in which the person died. It does not refer to a specific address or latitude/longitude per se.[9] The death certificate allows for seven categories. The first three are for deaths in hospitals, either as an inpatient, an outpatient, or on arrival. The remaining four are for non-hospital deaths: hospice facility, nursing home or long-term care facility, the decedent's home, or a catch-all grouping referred to as "all other." Figure 10 shows the age profile of the place of death for 2019. It is strongly correlated with cause of death. Deaths in a hospital setting and at home were more prevalent among younger decedents. Deaths in hospice and in a nursing home or long-term care facility were more prevalent among older decedents.

Since 2019, the pandemic has had a profound effect on U.S. mortality. By official count, as of December 31, 2021, there have been 976,422 deaths directly from COVID. This is an underestimate of the impact on population mortality, because many individuals have died indirectly from COVID (for example, if never diagnosed) and may have been assigned other causes of death on the death certificate, even if COVID was an important contributing factor. To capture this broader impact, the CDC has calculated a measure of

8. Technically speaking, the coding of deaths from Alzheimer's and other dementias on death certificates is complicated, because the disease itself does not result in death necessarily. For example, the leading cause of death for those with Alzheimer's is aspiration pneumonia, in which food or liquid enter the windpipe instead of the esophagus and result in infection in the lungs. Alzheimer's causes loss of functionality in the throat, but the cause of death would be pneumonia. In the death certificate data, this might appear as a "Respiratory" death as labelled in the text above. Alternatively, the cause might appear as Alzheimer's, which is not medically correct. Landes, Stevens, and Turk (2019) have provided a thorough discussion of this difficulty in the related domain of deaths of individuals with intellectual disabilities.

9. The certificate does ask for the address of the facility or home listed as the place of death. However, for example, for someone who is pronounced dead on arrival at a hospital, there is no way of knowing in all circumstances where the precipitating event occurred.

Figure 11. Total Deaths by Age for Persons 50 and Older Before and During the Pandemic



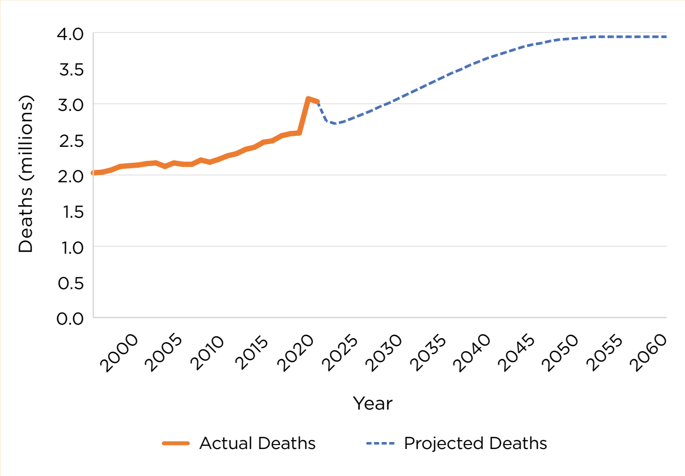
Source: *Vital Statistics*

"excess" deaths, defined as the difference between actual and expected deaths per interval of time.[10] Since population mortality typically evolves slowly, the aggregate number of deaths is very predictable. As of December 31, 2021, the CDC estimates 1,062,420 excess deaths from COVID.

Figure 11 plots the age profile of deaths for all individuals 50 and older before and during the pandemic. The dashed lines in the figure show the profiles in 2017, 2018, and 2019, respectively, based on the universe of deaths in these years from *Vital Statistics*. As can be seen readily, the profiles moved very slowly and are largely laid on top of each other. The first solid line in the figure shows the profile in 2020, based on the universe of deaths from *Vital Statistics*. For 2020, there was an upward shift in the number of deaths at all ages. The second solid line show the profile for 2021 based on provisional mortality data from CDC's WONDER database, which has a query-based tool that calculates aggregated mortality statistics from the universe of deaths in 2021 as reported up through January 2, 2022.[11] There was a similar upward shift up deaths at younger ages in 2021, but it attenuates around age 80. Mortality for those 80 and older in 2021 looks similar to that pre-pandemic, and possibly reflects the high rate of COVID vaccination among the oldest old that occurred in 2021.

Finally, Figure 12 illustrates the annual aggregate time series of deaths for older Americans. The solid orange line shows actual deaths from 1996 through 2021. The impact of the pandemic is obvious: deaths for those 50 and older have been about 500,000 higher during the pandemic than in 2019. The dashed line shows projected aggregate deaths through 2060 from the Social Security Administration's Office of the Chief Actuary. These are used in SSA's 75-year-ahead forecasts of the Social Security Trust Fund status that appeared in the SSA Trustees' Report released in May, 2021. As of that time, SSA was projecting that mortality would revert to pre-pandemic levels.[12] In the figure, this creates a notch in the time-series for 2020–21. Projected deaths rise steadily as the Baby Boomers age and eventually die, then plateau around 2045. By 2060, the tail end of the Baby Boom will be 95 or older.

Figure 12. Actual and Projected Aggregate Annual Total Deaths for Persons 50 and Older in 1996–2060



Source: Author's calculations; deaths after 2021 are based on SSA population and mortality projections

10. Excess deaths reflect the net impact of the pandemic from all sources, including not just the novel coronavirus, but also impacts on the health care system from staffing shortages, changes to the scheduling of surgeries and other procedures, and other health care capacity constraints in treating patients, especially during the worst episodes of the pandemic.

11. The final death data and microdata files usually become available in July of the following year, so July, 2022, for deaths in 2021. Therefore, no microdata for 2021 are used in this analysis.

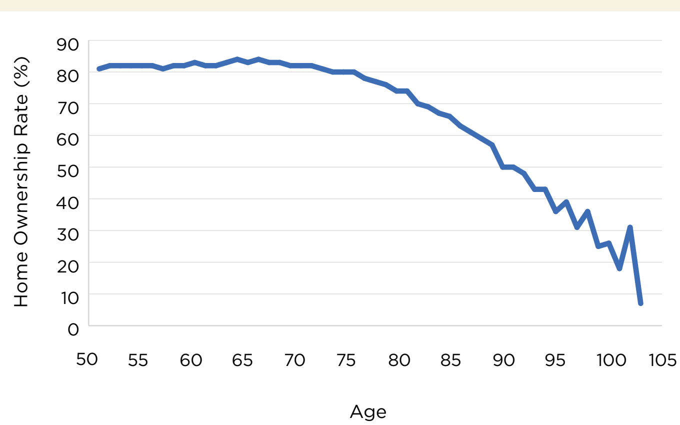
12. The next Trustees' Report is due in May, 2022. It is unknown the extent to which SSA will update its mortality projections to reflect the ongoing pandemic and/or the impact of long-haul COVID.

3. Death and the Disposition of Housing Assets

The extent to which mortality generates homes for sale depends on a series of factors. The most important is the marital status of the decedent. The passing of the first-to-die in a homeowning couple generates a house for sale only if the surviving spouse decides to sell upon widowhood. If the widow(er) remains in the house, there is no net increase in homes on the market. For unmarried homeowners, death results in the transfer of ownership to heirs, who can sell the house or occupy it themselves. In the latter case, whether the death generates on a net increase in homes for sale depends, in turn, on whether the heir sold a different home in order to occupy the inherited home. If so, there is no net increase.[13]

To model homes for sale from mortality requires data on the disposition of homes for owners who die. This is not gathered on death certificates. Instead, the analysis uses novel data from the Health and Retirement Study (HRS). The HRS is a large, nationally representative sample of the American population aged 50 and older. Funded by the National Institute on Aging and the Social Security Administration, the HRS is, in many ways, a truly remarkable data gathering effort. It is a stratified random sample of over 25,000 individuals 50 and older, and their spouses (regardless of age), that began in 1992. Individuals are interviewed every two years until they die. Every six years (e.g., 1998, 2004, 2010, 2016, etc.), a new birth cohort of individuals in their mid-50s enters the study, refreshing the panel to ensure it remains representative of older Americans.

Figure 13. Age Profile of Homeownership in the HRS



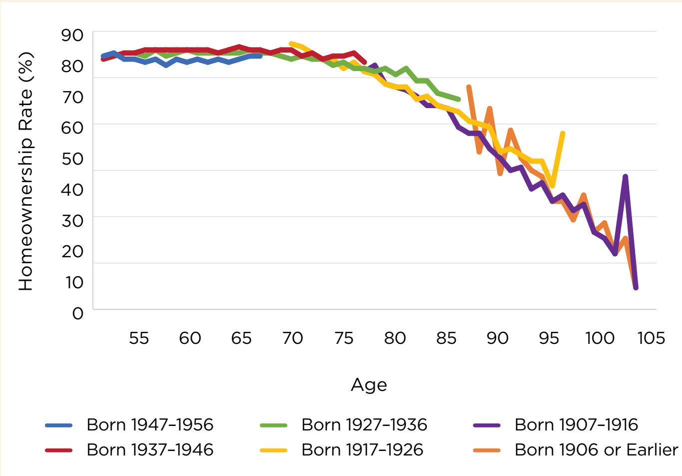
Source: Health and Retirement Study

Figure 13 shows the age profile of homeownership in the HRS using individuals drawn from all available waves. The homeownership rate is very high for those in their 50s, over 80 percent. The rate rises slightly with age and peaks at age 65 at 83.7 percent. It declines slowly until the late 70s, and then more rapidly thereafter.[14] It declines to 7 percent for persons 103 or older, the last age shown. Figure 14 repeats this calculation, but for 10-year birth cohorts. Interestingly, the age profile of homeownership has been very stable across cohorts, an empirical relationship that will be used in the projections of supply and demand below.

13. If the heir was a renter, there would be an increase in the owner-occupied market. However, the number of available units in the overall housing market might not increase, depending on how the former rental unit is used, or whether the renter formed a new household when occupying the inherited home.

14. The homeownership rate shown includes data on ownership at death from the exit interviews and used the HRS household sampling weights, as described in Engelhardt and Eriksen (2022).

Figure 14. **Age Profile of Homeownership by 10-Year Birth Cohorts in the HRS**



Source: Health and Retirement Study

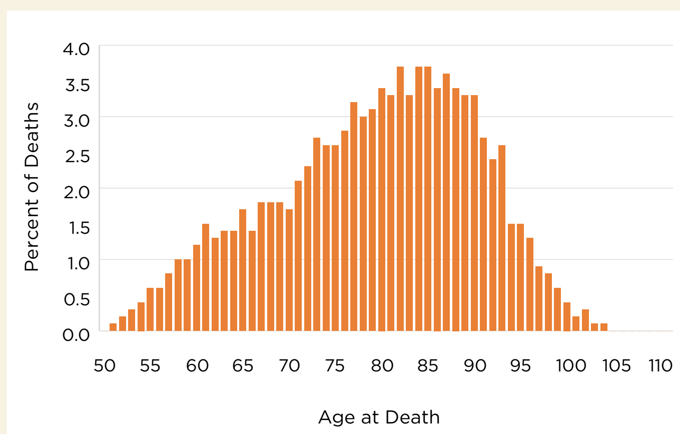
If an individual in the HRS dies between waves, an "exit" interview is given to the next of kin in the next wave of the survey. Since waves are two years apart, this interview could be soon or as much as two years after the person's death, depending on when the death occurred in the interval between waves. The interview itself consists of a large array of questions about the disposition of assets, including housing, as well as the circumstances surrounding the person's passing. These are critical for understanding the ultimate disposition of owner-occupied housing. In some cases, the decedent's estate is in probate when the exit interview is conducted. For these, a "post-exit" interview is conducted at the time of the next HRS wave, which could be as much as four years after the death of the participant. The post-exit interviews are brief follow-ups that aim to pin down the final disposition of assets after probate. Therefore, the advantage of the HRS is that it records housing tenure transitions later in life, through death, and the ultimate disposition of housing assets. Figure 15 shows the distribution of age at death from the exit interviews for all deaths pooled across all waves. It shares the same basic shape as the profiles in Figure 4.

The exit interviews provide a crosswalk between housing, bequests, and the mortality microdata used in Section 2 above. The interviews gather all of the basic demographic, cause, and place of death information that appears in the mortality data: age, sex, race, ethnicity, education, cause, place, and year of death. In addition, they track the ownership and disposition of homes at death: whether a home was owned at death, and if so, was the home transferred to a surviving spouse, sold in an arms-length market transaction (and the sale price), or bequeathed. This allows for the prediction of housing disposition for deaths observed in the mortality microdata.

This was done as follows. First, a multinomial logit model of ownership and disposition at the time of death was specified where the dependent variable outcomes were 0 if a renter at death, 1 if the home was owned at death and transferred to a surviving spouse, 2 if the home was owned at death and sold in an arms-length transaction after death, and 3 if the home was owned at death and bequeathed to someone (other than the surviving spouse, if married at the time of death). These outcomes were modeled as a function of the same covariates in the mortality microdata: age at death, sex, race, education, ethnicity, marital status, cause, place, and year of death, respectively, where age entered flexibly as a quartic function.

Second, the parameters of the logit model were estimated on the sample of all persons who died and had completed exit interviews in 1996–2019. Column 1 of Appendix Table 1 shows descriptive statistics for this sample, which is comprised of 12,941 individuals. The parameter estimates are shown in Columns 2–4 of the table, where the explanatory variables are comprised of the full set of measures in the mortality microdata: age at death (entered as a quartic), sex, race, education group, marital status, and ethnicity, as well as cause, place, and year of death. The estimates for ownership were combined with the information on age at death, sex, race, education group, marital status, and ethnicity, cause, place, and year of death in the mortality microdata in each year from 1996–2019 to predict the probability of ownership and disposition status for each individual in those

Figure 15. **Distribution of Age at Death for All Decedents in the HRS**



Source: Health and Retirement Study

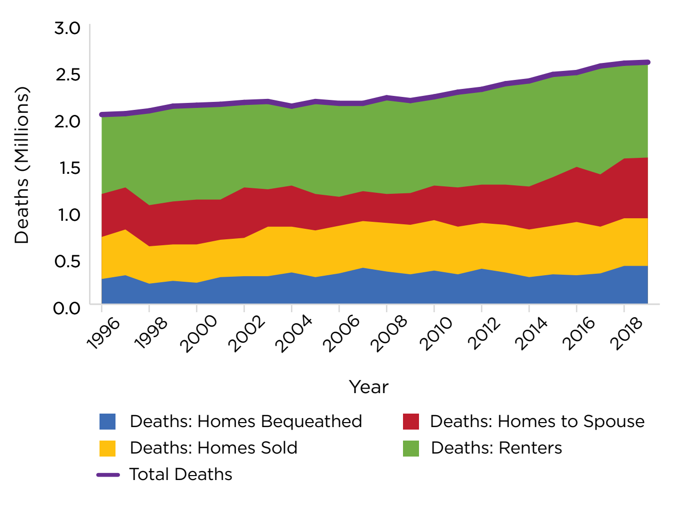
data. Those predicted probabilities were then aggregated up to make a share of aggregate deaths by ownership and disposition status.

The results are shown in Figure 16. The top contour is the aggregate number of deaths of persons 50 and older in each calendar year, from 1996–2019 taken from the mortality data. For each year, that aggregate was decomposed into four groups based on the multinomial logit parameter estimates applied to the mortality data:

- Decedents predicted to have been renters at the time of death, based on their age, sex, race, education, ethnicity, cause, place, and year of death (shaded in green);
- Decedents predicted to have owned a home and married at death, for which the home was transferred to the surviving spouse (red). These deaths did not generate new owner-occupied units to the market, assuming that the surviving spouse remains in the home;
- Decedents predicted to have owned a home and not married at death, for which the home was sold (yellow); and,
- Decedents predicted to have owned a home and not married at death, who immediately bequeathed the home (blue).

The boundary between the last two groups is somewhat opaque. A home that is immediately "bequeathed" may eventually come up for sale. Similarly, a home may be transferred to heirs and immediately sold, appearing as an arms-length transaction in the exit interview.

Figure 16. Actual Aggregate Total Deaths and Deaths by Home Disposition for Persons 50 and Older in 1996–2019



Source: Author's calculations from HRS exit interviews and *Vital Statistics*

Three facts emerge from the figure. First, from 1996–2019, the share of decedents across the four categories has remained relatively constant. Second, in 2019, about 1 million deaths resulted in owner-occupied homes changing ownership. About 60% of those transfers resulted in arms-length sales (at the time of the exit interview); the remaining 40% as bequests. Third, the aggregate number of homes available to the market — the sum of arms-length sales and bequeathed homes (yellow plus blue) — changes over time very slowly and predictably.

4. Projecting the Supply of Homes for Sale from Population Mortality

A key objective of this analysis is to project the impact of population mortality on the supply of homes for sale. In general, projection of the effect of demographic change on the housing market has a long, and not particularly successful, tradition in economics. Mankiw and Weil (1989) famously examined the impact of the Baby Boom as it entered prime first-time homebuying ages on real house prices.

Based on a strong time-series relationship between population age structure and house prices over the 1947–85 period, they concluded that real house prices would be predicted to fall 47% over the two decades of the 1990s and 2000s. Of course, that did not transpire. From the mid-1980s to the mid-2000s, real house prices rose about 50%. There were a number of objections to the Mankiw-Weil analysis at the time (Mankiw and Weil, 1991) and shortly thereafter, including poor in-sample fit (Hendershott, 1991), concerns about the construction and interpretation of the focal age-based measure of housing demand (Hamilton, 1991; Swan, 1995), the sensitivity of the projections to the price elasticity of supply of housing (Woodward, 1991), econometric concerns (Holland, 1991), and the replicability of the results in other countries with similar demographics, but a different time-series of real house prices, such as Canada (Engelhardt and Poterba, 1991). Further analysis of the impact of age on the demand for housing suggested a rather flat age profile of demand, once other factors correlated with age, such as marital status, education, and income, were accounted for (Green and Hendershott, 1996; Green and Lee, 2016). This suggested that the eventual movement of the Baby Boom through the population would have small effects on real house prices, even without large supply elasticities. Attempts to gauge the impact of changes in population age structure on asset prices more generally have shown similarly indiscernible or ambiguous effects (Poterba, 2001).

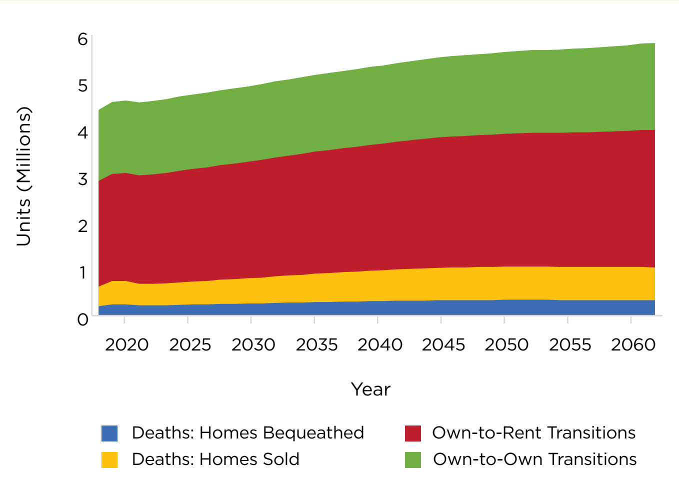
Recently, Myers and Simmons (2018) have returned to this topic and analyzed the impact of the aging of the Baby Boomers on housing markets, in general, and the transition out of homeownership, in particular. They use data from the 2013 and 2016 ACS to track changes in the age profile of homeownership by birth cohort. They used the change in the age profile of homeownership from pre-Baby Boom cohorts applied to the Baby Boom to estimate the impact of the aging of Baby Boomers on homeownership assuming Boomers behave like pre-Boomers as they age. They concluded that the aging and death of the Boomers would have large impacts on the future owner-occupied housing market.

Romem (2019) analyzed the impact of the death of the Baby Boomers on housing markets. He used data from the 2007 and 2017 ACS and life tables for 2016 from the Social Security Administration to project the number of homes to come available from the death of the Baby Boomers. He, too, found that the passing of the Boomers would generate a large supply of homes for sale, especially in areas with large shares of retirees.

A different tack is taken here. First, both the supply of homes for sale by older Americans and the demand for those homes are projected. Second, rather than use fixed population characteristics and mortality probabilities, the projections below use projected population characteristics and mortality probabilities. Third, three sources of homes for sale are projected.

The first source are homes that become available because of the death of the owner. These were shown by the sum of the blue and yellow series in Figure 16 for 1996–2019. The

Figure 17. Projected Supply of Homes to the Market by Source for Homeowners with Head Aged 50 and Older for 2019–2060



Source: Author's calculations based on HRS pre-pandemic tenure by age, sex, marital status; future demographics and mortality

methodology used there is expanded here to forecast the 2020–2060 period. Specifically, the basis for the projections is SSA's Office of the Chief Actuary forecast of U.S. population growth and mortality by age, sex, and marital status for each of the next 75 years.[15] The SSA forecasts apply to a smaller set of demographics than used to construct Figure 16. Consequently, the multinomial logit model of home disposition of decedents was re-estimated using just the SSA demographic measures as covariates: age at death, sex, marital status, and year of death, with age entered as a quartic function.[16]

These estimates appear in Columns 2–4 of Appendix Table 2. They were combined with the information on age at death, sex, and marital status, for each year in the 2019–2060 period to predict the probability of ownership and disposition status for each combination of age, sex, and marital status. Those predicted probabilities were applied to SSA's forecast of the number of deaths for each combination of age, sex, and marital status in each future year, and then aggregated up to calculate the number of homes supplied to the market by disposition status, just as in Figure 16. Therefore, the housing supply projections assume that the demographic determinants of home ownership and disposition at death remain in the long run the same as that in the 1996–2019 period, but allow for future year-to-year fluctuations in mortality risk and demographic composition as forecast by SSA.

The results are depicted by the yellow- and blue-shaded series in Figure 17. The vertical axis in the figure measures the number of housing units owned by a household with a head 50 or older that are put up for sale in that calendar year. Therefore, in 2019, there were just over six hundred thousand homes up for sale due to the death of the owner, including homes bequeathed.[17] There is a step up in the series due to the excess mortality in the pandemic, and then a step back down in 2022. After that, the series rises smoothly as the population ages and levels off at about one million units for sale because of mortality.

The second source are homes sold in an own-to-own tenure transition. These could reflect moves by older homeowners to better climates, extended family proximity, or to retirement communities that have better access to social life and medical services appropriate to normal aging. The third source are homes sold in an own-to-rent transition, often triggered by an adverse health event or widowhood. Homes for sale from these two sources are jointly projected as follows. First, a multinomial logit model of tenure transition was estimated using households from all waves of the HRS since 2000, with the following covariates: sex,

15. These are the same data used to project aggregate annual deaths in Figure 12.

16. A potential limitation of the SSA mortality probabilities is that they are defined only for a limited set of demographic categories (age, sex, marital status, and calendar year). Variation in age, sex, marital status, and year explain almost as much of the variation in home ownership and disposition outcomes in the multinomial logit model in Appendix Table 2 as in the richer specification in Appendix Table 1.

17. The projections depicted in Figure 17 must be anchored to match population housing unit, household, and individual totals by tenure status in some base year (as shown in Figure 16) to satisfy adding-up conditions to aggregate numbers. 2016 was chosen as that base year for a few reasons: First, the AHS data are the 2015, 2017, and 2019 waves. The AHS transitions used for the projections were for the 2015–2017 waves (the 2017–2019 transitions were used to pin down structural vacancies). Second, the HRS exit data are every two years up through 2018 (the 2020 exits will not be available until Fall 2022). The 2016 exit data were used to anchor the dispositions for the projections (with the 2018 used to pin down what eventually happened to properties in probate in 2016). The population and mortality projections from SSA start in 2019, but there are not the right AHS and HRS data to anchor the projections in 2019. Given these reasons, to get the aggregates to match up, data were anchored to 2016.

As such, if one extended back Figure 17 to 2016, it would match Figure 16 in 2016. However, since Figure 16 displays actual data for 2017–2019, there will be a wedge between the actuals in Figure 16 and the projected in Figure 17. What accounts for the (sizable) wedge? First, there were more deaths in 2019 than would have been predicted based on the 2016 mortality projections, and hence more dispositions in aggregate. Second, there were more dispositions of homes sold and bequeathed in 2018, versus the earlier exit years (i.e., the year effect for 2018 is positive in the logit regressions). Third, a broader range of explanatory variables in the logits are used to make the actual dispositions in Figure 16, than for the projections in Figure 17. This is because SSA projections future population and mortality only on the set of demographics that matter to it for its policy purposes.

Finally, it should be noted, given these issues, that one cannot simply re-scale the projections in Figure 17 to match the 2019 values in Figure 16, because this causes other aggregates to not match or generates intermediate values that cannot (yet) be verified in the underlying source data (e.g., AHS, no 2021 data; HRS, no 2020 weights and no 2020 exit data; ACS, 2020 data do not have final weights, etc.).

marital status, calendar year, and age (entered as a quartic function). The dependent variable measured the following tenure transitions: rent-to-rent; rent-to-own; own-to-own without a sale (i.e., no move); own-to-own with a sale (i.e., with a move); and own-to-rent.[18]

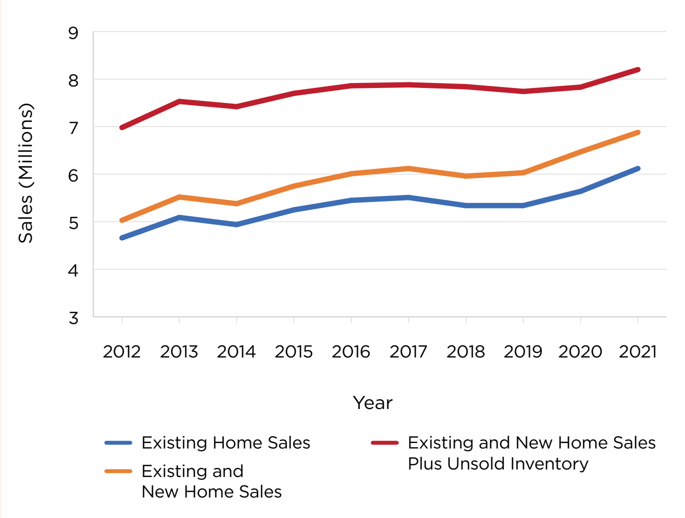
The parameter estimates from the model were used to make predicted probabilities for each of the transitions. Those probabilities were adjusted for household size, applied to SSA's forecast of the number of living persons for each combination of age, sex, and marital status in each future year, and then aggregated up to calculate the number of homes supplied to the market via own-to-own transitions involving a sale and own-to-rent transitions. Technically, the projections also were anchored to match the actual number of individuals 50 and older and households headed by someone 50 and older, respectively, in 2016 and 2019. For 2019, the last year of the pre-pandemic period and the last year of deaths in the HRS exit data used to project homes for sale from mortality, there were an estimated 116,815,000 individuals and 71,007,680 households with heads aged 50 and older. For 2016, the last year for which the HRS is fully representative of the 50 and older population, there were an estimated 108,455,240 individuals and 65,926,100 households with heads aged 50 and older.

The results are depicted by the red- and green-shaded series in Figure 17. In 2019, there were just over 1.5 million homes up for sale by older homeowners making an own-to-own housing transition. An additional 2.26 million homes were up for sale from older homeowners transitioning to rental housing. When combined with homes for sale from deaths, there were a total of 4.41 million homes supplied by older homeowners in 2019. As the population ages and Baby Boomers die, this is projected to grow to 5.83 million units by 2060.

18. For brevity, these estimates are not shown but are available from the author upon request.

As a point of comparison, Figure 18 presents the recent time series of national home sales from the National Association of Realtors® (NAR). In 2019, there were 5.34 million existing home sales. Combined with new home sales and unsold existing and new inventory, there were a total of 7.74 million units in 2019. This suggests that homes up for sale by older homeowners constitute a significant share of the annual supply of homes.[19]

Figure 18. Existing Home Sales and Unsold Inventory, 2012–2021



Source: National Association of Realtors®

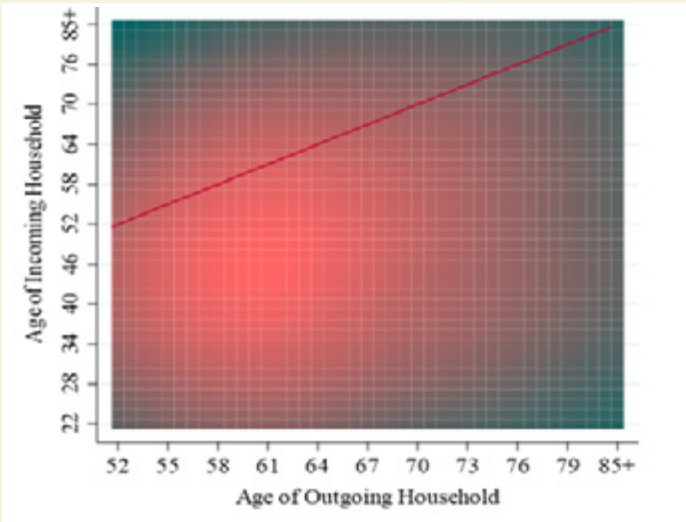
19. When comparing Figures 17 and 18 for calendar years 2020 and 2021, note that Figure 17 presents projections for those years based on pre-pandemic patterns of tenure transitions for older households plus mortality projections. In contrast, Figure 18 presents actual home sale data for those years.

5. Projecting the Demand for Homes for Sale from Population Mortality

To the extent the aging and eventual death of the Baby Boomers lead to increases in homes for sale, to whom would they be expected to sell? Although it is difficult to predict future patterns of demand, one place to look is at current patterns of demand and assume they continue to hold. To do so, data from the American Housing Survey (AHS) are used.[20] The AHS was commenced in 1984 and is conducted biannually by the U.S. Census Bureau. It is a large panel survey of residential units. Every two years, Census interviewers return to the unit and interview the occupants, regardless of their time in residence. When the occupants change, the AHS interviews the new occupants; the old occupants are not followed to their new residence(s). Therefore, in the case of an owner-occupied unit, the AHS can be used to analyze how household characteristics change when the occupancy of the home changes.

There are a couple of limitations of the AHS data. First, the survey was re-designed between the 2013 and 2015 waves, and a new sample of housing units was drawn in 2015. The previous panel, which began in 1984, therefore, ended with the 2013 wave. This means that housing unit transitions between 2013 and 2015 cannot be tracked. Consequently, only data from the 2015, 2017, and 2019 waves are used below. Second, there is no information about whether the previous occupant died or simply moved to a new residence. So, changes in occupancy of homes owned by the elderly in the AHS cannot be ascribed solely to mortality.

Figure 19. Joint Distribution of Occupants' Ages for Households Moving Out of Owner-Occupied Units



Source: American Housing Survey

20. The HRS cannot be used here. After the completion of the exit (and, if necessary, post-exit) interview, the person departs the HRS, and any housing owned at death is no longer tracked. In particular, there is no information on who purchases the house sold by an HRS respondent.

Figure 19 depicts the joint distribution of the age of the previous and new occupants, respectively, for homeowning households aged 50 and older who moved out of their housing units across waves in the AHS in the 2015–2019 period. The horizontal axis measures the age of the outgoing household head; the vertical axis measures the age of the incoming household head. The distribution, which is three-dimensional, is illustrated in the two-dimensional figure in the form of a heat map. Brighter shades of red indicate greater mass (or height) in the joint distribution. Although each tick mark on both axes measures increments of three years of age, the axes have different ranges: the horizontal axis runs from age 52 through 85 and older (the AHS truncates the age distribution at 85 to preserve confidentiality); the vertical axis runs from 22 through 85 and older. Therefore, housing-unit transitions that lie along the 22.5 degree line, shown as the solid crimson line, represent out-going and in-coming household heads of the same age. Points above that line indicate that the unit transitioned to an older head; points below the line indicate the unit transitioned to a younger head. In general, for movers-out, the bulk of the distribution lies below the line, indicating that on average housing owned and occupied by older occupants transitions to younger occupants, and, in particular, those in the 35–50 year old range.

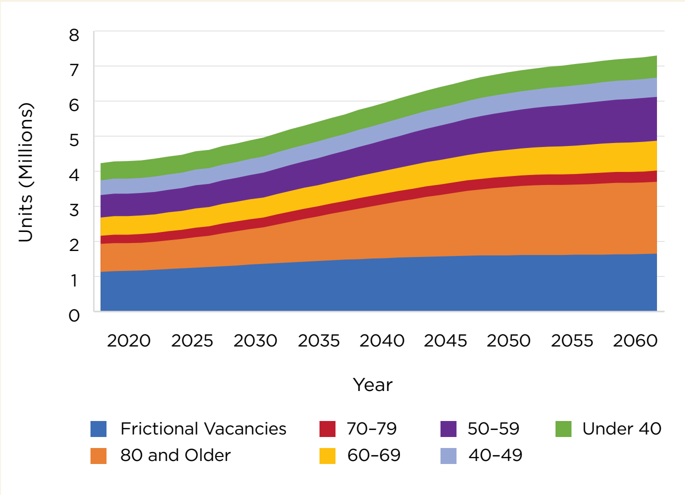
To project future total demand for homes for sale from older homeowners, a process similar to that for forecasting supply was used. Here, total demand is the sum of demand for units by new occupants who own the unit and new occupants who rent the unit. So, these projections do not delineate between buyers based on housing tenure, just purely on age, sex, marital status, and future year. Specifically, the basis for the projections is, again, SSA's Office of the Chief Actuary forecast of U.S. population by age, sex, and marital status for each of the next 75 years.[21] A multinomial logit model of the age of the next occupant was specified, the dependent variable for which allowed for the following categories for the current and new occupants:

- Currently owner-occupied, no sale, and no new occupant at next interview (2 years later);
- Currently owner-occupied, sale, and new occupant at next interview of age A, A=22 or under, 23,…,79, 80–84, and 85 or older;[22]
- Currently owner-occupied, sale, unit is vacant or usual residence elsewhere at next interview;
- Currently renter-occupied and no new occupant at next interview;
- Currently renter-occupied and new occupant at next interview of age A, A=22 or under, 23,…,79, 80–84, and 85 or older;
- Currently renter-occupied, unit is vacant or usual residence elsewhere at next interview

These outcomes were modeled as a function of the SSA demographic measures: age, sex, marital status, and year of death, with age entered as a quartic function.

The estimates were combined with the information on age, sex, and marital status, for each year in the 2020–2060 period to predict the probability of a purchaser of age A for each combination of older homeowner (i.e., seller) age, sex, and marital status.[23] Those predicted probabilities were applied to SSA's forecast of population for each combination of age, sex, and marital status in each future year, and then aggregated up to calculate the number of homes demanded by age of the purchaser. As with supply, the demand projections were anchored to match the actual number of individuals 50 and older and households

Figure 20. Projected Total Demand by Age for Homes Supplied to the Market by Homeowners Aged 50 and Older, for 2019–2060



Source: Author's calculations based on HRS pre-pandemic tenure by age, sex, marital status; future demographics and mortality

21. These are the same data used to project aggregate annual deaths in Figure 12.

22. For reasons of confidentiality, the AHS pools occupants aged 80–84 together in the public-use data, as well as occupants 85 and older. Occupants under age 22 are separately identified by single year of age, but were pooled for the purposes of estimation, because there were comparatively few owner occupants in this age range.

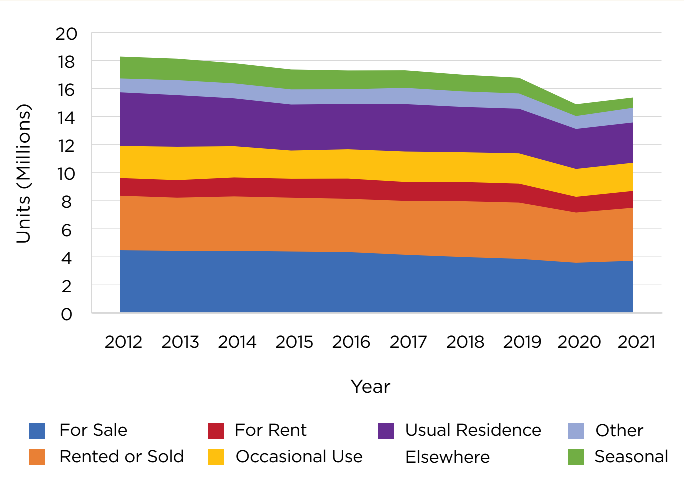
23. Given the number of potential outcomes, the parameter estimates are not given here, but are available from the author upon request.

headed by someone 50 and older, respectively, in 2016, the mid-way point between the 2015 and 2017 waves of the AHS.[24] Therefore, the housing demand projections assume that the demographic determinants of purchases of homes formerly owned and occupied by older households remain in the long run the same as that in the 2015–2019 period, but allow for future year-to-year fluctuations in population and demographic composition as forecast by SSA.

The results are depicted in Figure 20. Each band reflects purchasers of a given age range for homes supplied as older homeowners age and die. In 2019, just under 800,000 homes sold by older homeowners were predicted to have been next occupied by households with heads 80 or older (shown in orange). The age range with the largest demand are 50–59 year olds; the smallest demand, 70–79 year olds. As the population ages and Baby Boomers die, growth in demand is greatest among those 50–59 and 80 and older.

Since the AHS has no information about whether the previous occupant died or simply moved to a new residence, it is unclear whether vacancies in the survey represent frictional (e.g., homes in probate, under renovation, etc.) or structural vacancies (e.g., lack of demand, habitability, etc.). To address this, homes owned and occupied by an older household that were registered in the next wave as vacant were followed for an additional wave (i.e., four years hence). If still vacant, it was deemed a structural vacancy.

Figure 21. Annual Housing Vacancies by Type, 2012–2021



Source: U.S. Census Bureau, Housing Vacancy Survey and American Housing Survey

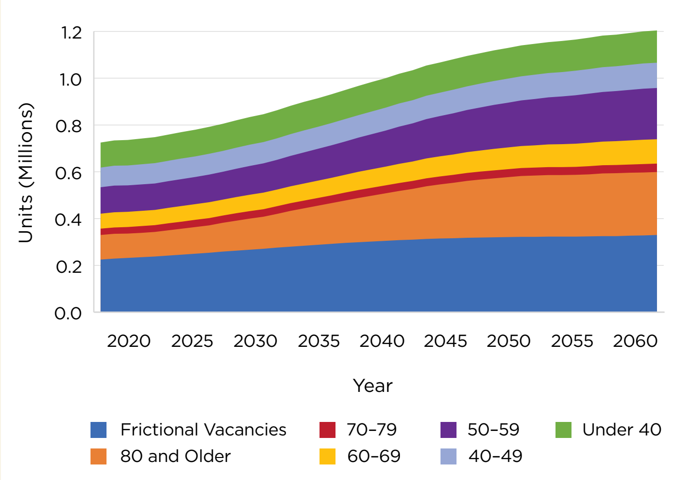
24. Since the logit model examines changes in occupancy, the three waves of the AHS (2015, 2017, 2019) generate two waves of occupancy change, 2015 to 2017 and 2017 to 2019. The choice of the anchoring year is mid-way between the first year of these two change periods and matches the anchoring year for the supply projections.

Based on this categorization, approximately 70 percent of newly vacant homes are frictional vacancies, with the exact percentage varying by the age of the owner. The bottom band in Figure 20 represents the forecast of these frictional vacancies. These vacancies are substantial: in 2019, there were 1.12 million such vacancies, more than a quarter of the ”total demand” for homes for sale by older owners.

For additional comparison, Figure 21 presents the recent time series of national vacancies from the Census Bureau. There were 1.12 million vacant units for sale, 1.1 million rented or sold, and another 3.2 million for rent, totaling 5.4 million in those categories. This suggests that homes supplied to the market by older homeowners account for a non-trivial share of national vacancies. Furthermore, these vacancies are not originating solely from homes bequeathed, as that supply was predicted to around 400,000 in 2019 from Figure 17.

Figure 22 repeats the projections in Figure 20, but for rental demand. Roughly speaking about 20 percent of homes supplied by older homeowners will be subsequently occupied as rental units, with the exact percentage varying by the age of the owner. Each band in the figure reflects age-based rental demand for units from older homeowners, with the bottom band measuring frictional vacancies. An important message here is that the supply of homes from older homeowners as they age and die need not (and will not) flood the market for owner-occupied housing, because a share of them will be converted to rental units, the age-pattern of demand for which is shown in the figure.

Figure 22. Projected Rental Demand by Age for Homes Supplied to the Market by Homeowners Aged 50 and Older, for 2019–2060



Source: U.S. Census Bureau, Housing Vacancy Survey and American Housing Survey

6. Implications and Caveats

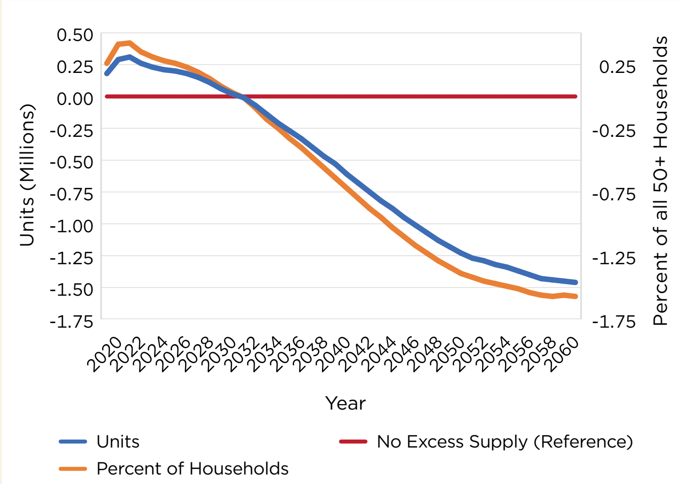
Romem (2019) used the phrase the “Silver Tsunami” to describe the impact of the aging and death of the Baby Boomers on the national housing market. Although it is a powerful metaphor, a tsunami is a sudden and unexpected event. In contrast, population aging and mortality, as the analysis has shown, is slow moving and largely predictable. A more accurate metaphor for the aging of the Baby Boom might be a glacier — massive and slow-moving. Which begs the final question, what will happen to the market for the homes currently owned by older Americans when the Boomers age and die out?

The blue line in Figure 23 plots the projected excess supply of housing from the aging and death of older homeowners, defined as the difference between the projected supply from Figure 17 and demand from Figure 20. This represents the misalignment of supply and demand due purely to demographic change based on the pre-pandemic patterns of supply (from the HRS) and demand (from the AHS) measured above. Over the next decade, demographic shifts will result in excess supply of about a quarter million units, an effect that decays with time. By the early 2030s, there is projected excess demand that increases each year through 2060.

Although it might seem counterintuitive that the demographic pressure from population aging abates in a decade, the key drivers are the population growth of younger households, like the Millennials shown in Figure 2, and the conversion of owner-occupied to rental units, as depicted in Figure 22. Even if the Millennials do not form nuclear households and become homeowners in the same proportion as their parents, they still demand housing, which may, in this case, be rental housing. This is illustrated in Figure 24, which repeats the calculation of excess supply, but under the assumption that the owner and rental markets are segmented such that owner-occupied units sell and remain owner-occupied, which is essentially the assumption made in Myers and Simmons (2018). In this case, the demographic shifts result in substantial excess supply of close to a million units over the next decade. The total impact fades by 2047.

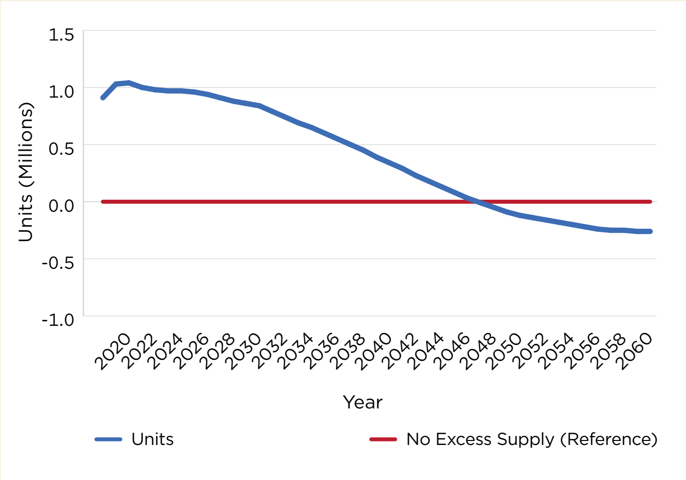
Since population aging and mortality is slow-moving and predictable, it is unlikely that the housing market will respond with measurable reductions in prices. The orange line in Figure 23 measures the excess supply as a share of the total number of households with heads 50 and older. Over the next decade, this excess supply will be a very small share, less than one-half of a percent. However, it represents a non-trivial share of new housing construction. In particular,

Figure 23. Projected Excess Supply of Housing from the Aging and Death of Owner-Occupiers Who Are 50 and Older



Source: Author's calculation based on the projections in Figures 17 and 20

Figure 24. Projected Excess Supply of Housing from the Aging and Death of Owner-Occupiers Who Are 50 and Older, Under the Assumption of Segmented Owner and Rental Markets



Source: Author's calculation based on the projections in Figures 17, 20 and 22

Figure 25 plots the national aggregate time series of housing permits, starts, and completions. In 2021, there were about 1.25 million completed units. Demographic-induced excess supply of a quarter million units is 20 percent of new construction. This suggests that the housing market's response to population aging and mortality may come in a reduction in new construction over the decade with some softness in the rental market, consistent with the conclusion of Romem (2019).

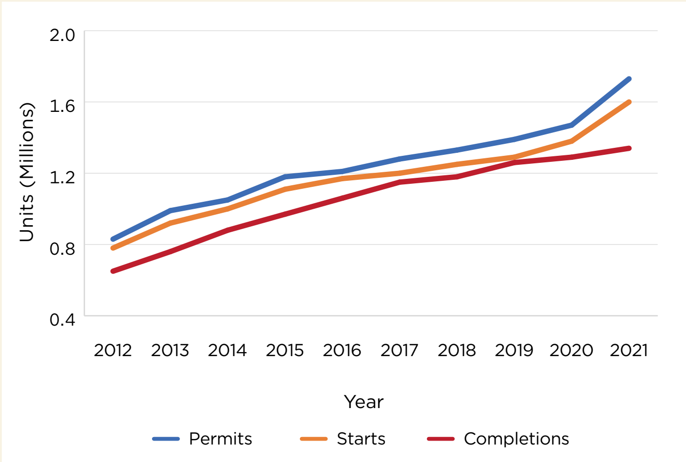
These conclusions are tempered by the following caveats. First, forecasting is complicated and inherently uncertain, especially looking, as the analysis did, to 2060, forty years into the future. Events in the housing market in the last year alone have been stunning.

Second, the projections of supply and demand assumed that the pre-pandemic patterns will continue to hold. Although the fact that the birth-cohort age profiles of homeownership in Figure 14 have been stable over time is reassuring, there are no guarantees going forward. Not only are there more Baby Boomers than other birth cohorts, but the Boomers themselves may have different tastes and resources for housing as they age relative to previous cohorts. Unfortunately, there are not data on Baby Boomers' expected future demand for housing. So, with the existing data available, studying the past and assuming those patterns hold in the future is an obvious and perhaps the only practical forecasting strategy. However, one thing we know is that the Boomers have often broken the mold — in virtually every aspect of the economy and culture they have touched — so it is reasonable to expect they might behave differently.

Third, the projections assumed the pre- and post-pandemic housing markets are similar. Over the last two decades, there have been notable changes in place of death. Specifically, there has been a large increase over time in dying at home. What has driven this is unknown but may possibly be related to changes in Medicare and Medicaid hospice reimbursement policy, in particular home hospice. Although it is uncertain this trend will continue, the high infection and death rate in elder care facilities during the pandemic may increase the demand to age in place. The pandemic also has changed the residential preferences of all Americans and fueled the recent rise in house prices.

Finally, this analysis was national in scope, with no spatial focus. Older Americans geographically are not spread evenly. Romem (2019) argued that cities and states in the South and West with large retiree populations would be disproportionately hit by the Silver Tsunami. This is undoubtedly true and important, but beyond the scope of analysis due to data limitations.[25] Incorporating geographic variation into projections of future housing demand and supply from population aging is an important avenue for future research.

Figure 25. Aggregate Housing Permits, Starts, and Completions, 2012–2021



Source: U.S. Census Bureau

25. This would require geo-coded mortality data, as well as geo-coded versions of the HRS and AHS. These datasets are, in principle, available through restricted-access confidential data agreements, but, in practice, were not available at the time of writing.

Appendix

Table 1. Multinomial Logit Parameter Estimates for Home Ownership and Disposition at Death
Using the HRS Exit Interview Data and the Demographic Characteristics in the Vital Statistics Mortality Microdata, Standard Errors in Parentheses

Explanatory Variables	(1) Means	(2) Given to Spouse	(3) Sold After Death	(4) Bequeathed
Age	80.1	-0.205 (0.039)	0.065 (0.032)	0.049 (0.034)
Age-Squared		-0.308 (0.041)	-0.305 (0.029)	-0.278 (0.030)
Age-Cubed		0.114 (0.041)	-0.027 (0.029)	-0.053 (0.031)
Age-to-the-Fourth		0.062 (0.036)	0.011 (0.029)	0.009 (0.031)
Female	0.535	-0.416 (0.061)	-0.163 (0.056)	0.098 (0.063)
Married	0.452	4.339 (0.386)	0.307 (0.137)	-0.091 (0.154)
Widowed	0.413	-1.103 (0.455)	0.363 (0.136)	0.655 (0.147)
Divorced	0.098	-0.420 (0.469)	-0.115 (0.151)	0.237 (0.160)
Black	0.164	-0.370 (0.085)	-0.713 (0.083)	-0.077 (0.075)
Other Race	0.035	-0.365 (0.158)	-0.474 (0.169)	-0.530 (0.183)
Hispanic	0.072	-0.415 (0.117)	-0.455 (0.120)	-0.073 (0.115)
High School Degree	0.317	0.226 (0.072)	0.390 (0.067)	0.178 (0.068)
Some College	0.165	0.366 (0.086)	0.452 (0.079)	0.119 (0.086)
College Degree	0.068	0.444 (0.117)	0.758 (0.106)	0.255 (0.124)
More than College	0.063	0.588 (0.120)	0.853 (0.112)	0.504 (0.160)
Died in Nursing Home	0.222	-0.515 (0.087)	-0.562 (0.073)	-0.666 (0.081)
Died at Home	0.297	0.226 (0.069)	0.189 (0.067)	0.374 (0.069)
Died in Hospice	0.082	0.022 (0.112)	-0.133 (0.103)	-0.095 (0.110)
Died in Assisted Living	0.011	-1.682 (0.439)	-0.558 (0.222)	-0.822 (0.272)
Died in Other Place	0.032	0.005 (0.168)	0.277 (0.143)	0.213 (0.162)
Died of Cardiovascular Disease	0.323	-0.322 (0.078)	-0.330 (0.076)	-0.145 (0.081)
Died of Respiratory Disease	0.106	-0.221 (0.106)	-0.406 (0.109)	-0.125 (0.107)
Died of Diabetes	0.031	-0.173 (0.175)	-0.326 (0.166)	-0.295 (0.174)

Continued next page

Table 1 (continued)

Explanatory Variables	(1) Means	(2) Given to Spouse	(3) Sold After Death	(4) Bequeathed
Died of Digestive Disease	0.066	-0.439 (0.130)	-0.488 (0.120)	-0.323 (0.125)
Died of Other Causes	0.262	-0.409 (0.093)	-0.411 (0.085)	-0.419 (0.093)
Constant		-3.375 (0.425)	-0.665 (0.211)	-1.334 (0.231)
Year Effects Included?		Yes	Yes	Yes

Note: Each column shows parameter estimates for a different outcome from a single multinomial logit estimation. Sample size was 12,941 observations drawn from the HRS exit interviews. The omitted category for the dependent variable was being a renter at death. A full set of year effects for 1997–2018 were included; the constant represents 2016. Omitted groups were men, whites, non-Hispanics, hospital deaths, cancer deaths, never married and high school dropouts.

Table 2. Multinomial Logit Parameter Estimates for Home Ownership and Disposition at Death
Using the HRS Exit Interview Data and the Demographic Characteristics in the SSA 75-Year Ahead Projections, Standard Errors in Parentheses

Explanatory Variables	(1) Means	(2) Given to Spouse	(3) Sold After Death	(4) Bequeathed
Age	80.1	-3.007 (2.372)	-0.978 (2.145)	-1.395 (2.296)
Age-Squared		0.072 (0.048)	0.023 (0.042)	0.029 (0.045)
Age-Cubed		-0.0007 (0.0004)	-0.0002 (0.0003)	-0.0002 (0.0003)
Age-to-the-Fourth		0.000003 (0.000001)	0.0000006 (0.000001)	0.0000008 (0.000001)
Female	0.535	-0.434 (0.059)	-0.192 (0.055)	0.062 (0.061)
Married	0.452	4.447 (0.385)	0.466 (0.133)	0.003 (0.061)
Widowed	0.413	-1.071 (0.455)	0.413 (0.131)	0.698 (0.145)
Divorced	0.098	-0.391 (0.469)	-0.076 (0.147)	0.264 (0.158)
Constant		38.947 (43.536)	11.164 (40.679)	20.412 (43.561)
Year Effects Included?		Yes	Yes	Yes

Note: Each column shows parameter estimates for a different outcome from a single multinomial logit estimation. Sample size was 12,941 observations drawn from the HRS exit interviews. The omitted category for the dependent variable was being a renter at death. A full set of year effects for 1997–2018 were included; the constant represents 2016. Omitted groups were men and never married.

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