



Chapter 3

Population, Aging, and the Economy

Death rates in the United States have declined over the past century, leading Americans to live longer, healthier lives, on average, than ever before. Birthrates have declined, as well, though less steadily and with a short-lived increase in the mid-20th century.

Declining birthrates and death rates arose in the context of expansions in educational and labor market opportunities, progress toward gender equity, and technological advancements in medicine and public health. Today, they imply a slowing of U.S. population growth that is unprecedented in the country's history.

The impact of this and the other demographic trends that are the subject of this chapter will have important effects on our Nation and our economy. They form the backdrop for how the subjects of other chapters in this *Report*—such as the labor market, artificial intelligence, climate, and housing—will play out. How these changes affect Americans will depend on the Nation's institutions and policy environment. Some demographic trends call for immediate responses. Increases in drug overdose deaths and worsening maternal mortality are urgent issues that demand decisive action. Other demographic patterns—like the decline in U.S. fertility to historically low levels and the growth of seniors' share of the population—are important to understand to help the Nation anticipate, plan for, and manage the changes.

An aging population implies fiscal challenges for social safety net programs—like Medicare, Medicaid, and Social Security—as the working share of the population declines. Low fertility also implies that immigration policy will play an increasingly important role in shaping the growth and

composition of the U.S. population and labor force. Without positive net migration, the U.S. population is projected to begin shrinking by about 2040 (U.N. DESA 2022a; CBO 2024).

This chapter begins by describing fertility and mortality trends and their causes. Some trends, like the acute spike in deaths during the COVID-19 pandemic, are short-lived. Others, like the trend toward smaller families and childlessness in American households, are likely to persist due to diffuse and slow-moving social, political, and economic changes. The persistent trends imply that the U.S. population will continue to age, and the chapter discusses what the aging U.S. population will mean for the U.S. labor force, consumer demand patterns, productivity, saving and borrowing, the care economy, and the fiscal future.

Declining Fertility in the 21st Century

The United States has experienced a sharp decline in birthrates since 2009. This decline mirrors trends among other advanced economies in recent decades. A trend toward smaller families has been widespread among Americans, with U.S. women from varied backgrounds and demographic groups choosing to have fewer children and waiting until later in life to have them than at any other time in the country’s history (Aragão et al. 2023; Smock and Schwartz 2020). This section describes these trends and their economic causes in order to better anticipate whether these patterns are temporary or likely to persist over the coming decades. A key theme of this section is that the widespread, long-run declines in U.S. birthrates—and birthrates worldwide—are rooted in improvements in living standards, wages, and opportunities.

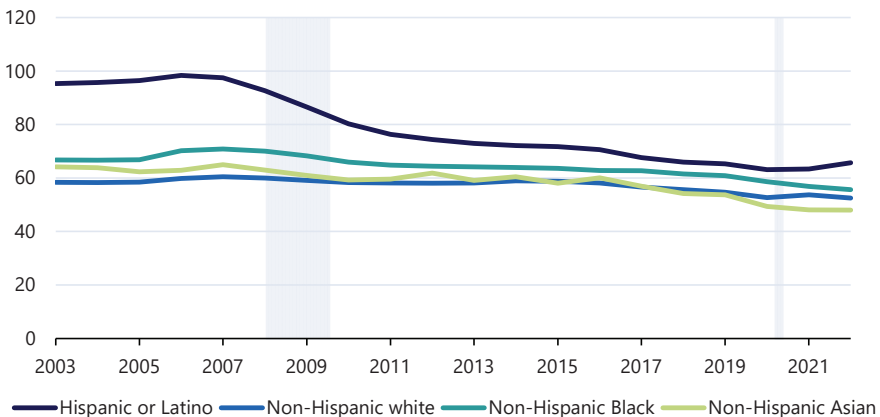
U.S. Fertility Since the Global Financial Crisis

Declining U.S. fertility is not new, but rather the continuation of a long-run trend that accelerated after the global financial crisis (Bailey and Hershbein 2018).¹ An intuitive summary measure of fertility is the total fertility rate (TFR), which describes the number of children a woman would have if she followed the age-specific childbearing patterns in her country at a given point in time. For example, a TFR of 2.0 would indicate that over a lifetime,

¹ “Fertility” in this chapter refers to measured birthrates. It is separate from the medical concept of “infertility.”

Figure 3-1. Fertility Rates by Race and Hispanic Origin, 2003–22

Annual births per 1,000 women



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Source: Centers for Disease Control and Prevention WONDER.

Note: Annual births per 1,000 women age 15–44 years in the given year. Race and Hispanic origin refer to the mother. Gray bars indicate recessions.

2024 Economic Report of the President

a woman following the typical patterns of birth in her place and time would have two children. Any TFR below 2.0 is known as “subreplacement,” meaning that the population would eventually shrink in the absence of migration.²

The U.S. TFR fell from 2.12 in 2007 to 1.67 in 2022 (Hamilton, Martin, and Ventura 2009; Hamilton, Martin, and Osterman 2022). The decrease after the global financial crisis was driven more by a decline in the number of families with any children than by shrinking family sizes among those with some children (Kearney, Levine, and Pardue 2022). The pattern coincides with broad societal changes in marriage and childbearing norms (Parker and Minkin 2023).

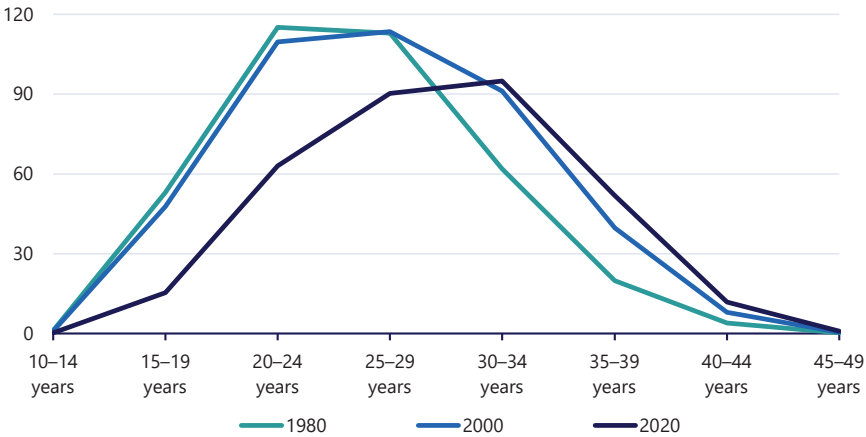
The decline in fertility has been across all groups defined by race, ethnicity, and nativity. However, before the global financial crisis, some demographic groups differed significantly in fertility rates. In 2007, fertility rates among Hispanic women were about 40 percent higher than those of Black, non-Hispanic women and about 60 percent higher than those of white, non-Hispanic women. By 2019, the rates had largely converged (see figure 3-1).

Figure 3-2 shows that women today are more likely to delay childbearing than their predecessors. The figure plots age-specific fertility rates (i.e.,

² “Replacement-level fertility” is slightly above 2.0 and varies across time and place. It accounts for naturally occurring sex ratio imbalances at birth and the fact that not all people will survive through their childbearing years. In all places and times, fertility below 2.0 is subreplacement.

Figure 3-2. Age-Specific Fertility Rates Over Time

Annual births per 1,000 women



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Source: National Center for Health Statistics.

Note: National births per 1,000 women for each age group. In the periods plotted, all States are represented.

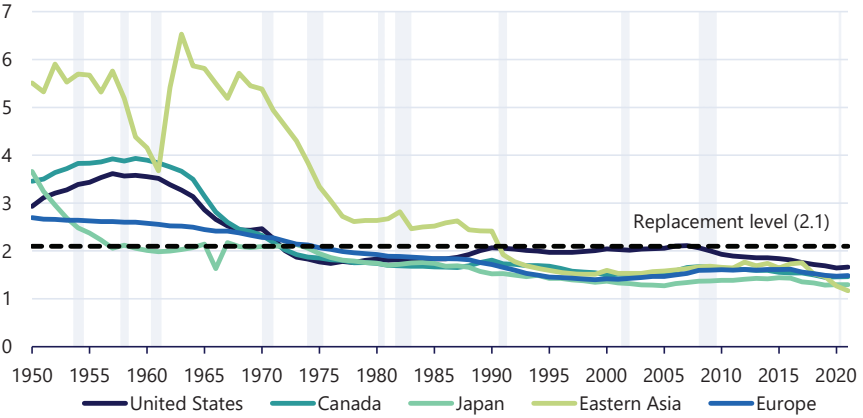
2024 Economic Report of the President

annual births per thousand women observed in each age group), indicating how the childbearing age profile has shifted rightward over the past several decades. As recently as 2006–11, age-specific fertility was highest in the 25–29 age group (Erbabian, Osorio, and Paulson 2022). As of the latest data from 2022, the rates are highest among women age 30–34. Overall, figure 3-2 implies both fewer births and an older average maternal age when giving birth in 2020, relative to past decades.

Figure 3-2 shows that fertility among women in their late 30s and 40s has been climbing for the past four decades. With improved access to contraception and the growth of assisted reproductive technology (ART)—a blanket term referring to medical procedures designed to help achieve a pregnancy (CDC 2019a)—more women are having children at later ages. The growth of and access to ART help women and families achieve their desired number of children, including later in life. In 2020, more than 74,000 (2 percent) of the roughly 3.6 million infants born in the United States were conceived with ART (CDC 2022). The number of healthy women who froze their eggs, an approach to delaying childbearing, rose from roughly 7,000 in 2016 to about 12,000 in 2020, a more than 70 percent increase (Kolata 2022). Based on growing ART use in other advanced economies (Chambers et al. 2021; Lazzari, Gray, and Chambers 2021), this technology is likely to play an increasingly important role in the United States, enabling some women to achieve their desired families at older ages and helping some

Figure 3-3. Total Fertility Rate in the United States and Other High-Income Countries and Regions, 1950–2021

Annual live births per woman



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Source: United Nations, *World Population Prospects 2022*.

Note: Gray bars indicate recessions.

2024 *Economic Report of the President*

young women delay childbearing with greater assurance of eventual successful pregnancies.

Low Fertility: A Global Trend

Though the recent downturn in birthrates since the global financial crisis has attracted significant attention, U.S. fertility has declined over a much longer span. Figure 3-3 plots TFR for the United States, Canada, Japan, Eastern Asia, and Europe. The figure shows that the rate has decreased in the United States, from roughly 3.6 in 1960, near the peak of the U.S. baby boom, to about 1.7 in 2021 (U.N. DESA 2022a).

The U.S. trend is in line with global fertility rate declines. In the mid-20th century, global TFR was 4.9. The global average has decreased to 2.3 children per woman in 2021 (U.N. DESA 2022a). Two-thirds of the global population is estimated to now live in a country with below-replacement fertility (Spears 2023), and the world population is projected to begin shrinking this century (Spears et al. 2023; U.N. DESA 2022a). The overall global fertility rate masks large variations across countries in both their current levels and transition paths, with the advanced European and East Asian economies displaying lower fertility than average.³

³ The social, political, and economic implications of China’s low fertility have garnered significant attention, particularly in 2023, when its total population was surpassed by India’s (U.N. DESA 2023). But low fertility is a global phenomenon, and today even India’s fertility is below replacement level (Spears 2023).

The experiences of other advanced economies offer clues to the United States' potential demographic future. In Europe, TFR declined from 2.7 in 1950 to 1.5 in 2021 (U.N. DESA 2022a). Since late in the 20th century, some of the world's lowest fertility rates have been found in major Asian economies. China, South Korea, and Japan—countries with diverse economic, policy, and social environments—are all characterized by low fertility rates today. Japan, with a TFR of 1.3, has been below replacement level for decades, along with Brazil, Canada, Chile, Germany, Thailand, and others.

Other countries' historical experiences are evidence that low fertility rates do not automatically rebound. The average fertility rate in Europe slowly declined in the second half of the 20th century. More recent trends suggest that the United States is also converging toward the general pattern of subreplacement fertility typical in high-income countries. Although 2021 U.S. fertility rates remained above those of European and East Asian countries, the global demographic trend suggests that U.S. rates may continue to decline in coming decades (PWI 2023).

Opportunity Cost

Decisions over whether and when to be a parent and what type of family to build are deeply personal and complex. Among adults without children who reported that they probably will not ever have children, survey evidence from Pew reveals diverse, multilayered explanations for not wanting children, some based on difficulties or constraints. Respondents listed financial reasons, medical reasons, concerns over the state of the world, and concerns over climate change (Brown 2021). (See box 3-1 for a discussion of how slowing U.S. population growth relates to current climate challenges.) Respondents who were already parents offered similar reasons, along with age, for not wanting more children. Yet the most common answer given in both groups was that these adults simply did not *want* to have children (or to have more children).

Economic analysis, even if it cannot capture the full texture of these decisions, can be helpful in understanding some of the underlying forces driving fertility trends. Decisions about having children are, after all, in part economic. Research suggests that birthrates are mostly pro-cyclical, rising in economic expansions and declining during downturns. But temporary economic conditions like recessions primarily affect *when* women have children, rather than how many they have over their lifetime or *if* they have them at all (Sobotka, Skirbekk, and Philipov 2011). Similarly, although media and popular sources suggest that children's direct costs explain falling birthrates (e.g., Picchi 2022; Hill 2021), researchers have found that rising costs for housing and childcare, while certainly having an impact on

Box 3-1. Climate and Population Growth

The past century has been a period of rapid growth in productivity, living standards, and population size in the United States and globally. It has also been a period of unprecedented increases in greenhouse gas (GHG) emissions from fossil fuel combustion, agriculture, and land use changes. The economics of reducing greenhouse gas emissions are more fully discussed in chapter 6 of this *Report*. This box focuses narrowly on how policy can decouple population size from environmental harm and explains why slowing population growth is no reason to relent on policy efforts aimed at reducing GHG emissions and climate harms.

The elasticity of emissions with respect to population size (i.e., how much emissions increase for each additional person) has never been constant, in part because it interacts critically with environmental policies, which are continuously changing the relationship between population size, prosperity, and environmental harm. For example, the Montreal Protocol, which was joined by the United States and 45 other countries in 1987, has dramatically reduced U.S. chlorofluorocarbon emissions that had been depleting the protective stratospheric ozone layer (EPA 2007). Similarly, the U.S. Acid Rain Program—a part of the 1990 amendments to the Clean Air Act—reduced U.S. sulfur dioxide emissions by 94 percent from 1990 to 2021. As of 2022, the emissions, which had contributed to air pollution and acid rain, were at their lowest point ever (EPA 2022). These successes demonstrate that when the United States and other governments choose to confront environmental challenges, a choice the Biden-Harris Administration has explicitly made, policy can significantly reduce linkages between population and environmental degradation.

The slowing and eventual reversal of global population growth that analysts forecast (Spears 2023) does not relieve the United States of the urgent need for environmental policy actions. While slowing population growth implies decreased emissions relative to a higher-fertility counterfactual, the demographic change is not large enough in magnitude to substitute for decisive policy action on GHGs (Kuruc et al. 2023).

Because of policy action today, led by the Biden-Harris Administration, the emissions elasticity with respect to population will continue to shrink in coming decades. The Inflation Reduction Act, which was signed into law by President Biden in 2022, is the most ambitious investment in combating the climate crisis to date. Together with the Bipartisan Infrastructure Law of 2021 and other enacted policies, it will help to lower U.S. GHG emissions to an estimated 40 percent below their 2005 level by 2030 (DOE 2022). These and other climate-focused Administration initiatives will fundamentally alter how Americans and U.S. economic activity affect the environment. A child born today is expected to live through 2100. The carbon footprint of that lifetime will be influenced by energy, transportation, agriculture, and land-use policy choices made now.

families, cannot account for the decline in fertility rates in the United States (Kearney, Levine, and Pardue 2022).

Researchers have long sought to understand the economic determinants of fertility. Canonical work by Gary Becker (1960) understood individuals' or families' demand for children as weighing the personal satisfaction that children bring parents against the time and monetary opportunity costs of parenting. Becker's insights remain relevant today, although the conceptual framework of opportunity costs is not sufficiently precise to make quantitative predictions about how particular changes in educational opportunities or wage rates will affect a country's TFR. Nonetheless, this understanding is consistent with birthrates falling over time in places where real income has risen relatively quickly (PWI 2023). Rising real income makes the cost of inputs like food and shelter more affordable in dollar terms (i.e., an income effect), while making parenting overall less affordable in terms of the opportunity cost of raising children (i.e., a substitution effect). The two effects push fertility decisions in opposite directions. Desired and realized family sizes declining over the last half century suggests that the substitution effect has dominated.

In the United States, young women's labor market expectations have been transformed dramatically over the last 50 years as part of a revolution in college and professional degree attainment, labor force participation, and the rising age of first marriage (Goldin 2004). In concert with these significant social and economic improvements, desires and decisions on childbearing have evolved. Women in their 20s and mid-30s are frequently in crucial career development periods, which drives up fertility's opportunity cost (Goldin and Mitchell 2017). Box 3-2 discusses the relationship between reproductive autonomy and female labor force participation, and box 3-3 discusses abortion access.

The expansion of opportunities over the past 50 years, including opportunities to combine and balance career and family, is a significant social and economic achievement. The Biden-Harris Administration is committed to improving options for working parents. The Administration has repeatedly called on Congress to create and fund a national comprehensive paid family and medical leave program, which would support parents' bonding with a new child by easing the financial pressure to immediately return to work after a birth or adoption.

Enhancing access to high-quality, affordable childcare is another channel through which policymakers can support working parents and caregivers, particularly women (Herbst 2022; Morrissey 2017). The Biden-Harris Administration's efforts and investments in supporting childcare have been comprehensive. During the COVID-19 pandemic, the Administration allocated a historic \$24 billion to the childcare industry through the American Rescue Plan. A previous analysis by the CEA documented that these

Box 3-2. Reproductive Autonomy and Labor Market Participation

In 1968, only about 30 percent of women age 20 to 21 years said they expected to be working by age 35. By 1975, this share approximately doubled, to about 65 percent (Goldin 2004). The ability to choose whether and when to have a child is essential for women’s ability to fully participate in the market economy. It is thus no coincidence that the period of rapidly increasing female labor force participation a half century ago corresponds to a period of rapidly improving reproductive health care options, especially hormonal birth control and the constitutional right to choose under *Roe v. Wade*.

A large body of research finds access to reproductive health care has benefits reaching into the labor market and beyond. These include reduced teenage pregnancies, delayed marriage, and improved educational attainment (Goldin and Katz 2002; Bailey 2006; Guldi 2008; Hock 2007; Bailey, Hershbein, and Miller 2012; Boonstra 2014; Myers 2017).

The Biden-Harris Administration believes reproductive rights are critical to maintaining the social, political, and economic progress of the past decades. The Affordable Care Act (ACA), by requiring most plans to cover contraception with no patient cost sharing, significantly advanced access to contraception (HHS 2022). The Administration has built on the ACA’s foundation, including by introducing enhanced subsidies for purchasing marketplace coverage in the Inflation Reduction Act and strengthening the contraception coverage provisions of the ACA (White House 2023f).

Box 3-3. Abortion Access and Fertility After *Dobbs v. Jackson Women’s Health Organization*

Access to reproductive health care is critical for women’s health and has the potential to affect demographic change. In its 2022 decision in *Dobbs v. Jackson Women’s Health Organization*, the U.S. Supreme Court overturned the precedent of *Roe v. Wade*, which in 1973 had recognized a constitutional right to choose. The *Dobbs* decision enabled States to enact new restrictions on abortion and newly enforce existing restrictions, including outright bans (Nash and Guarnieri 2022). Other States passed legislation to protect and advance access to reproductive health care, and voters in several States have voted in defense of reproductive rights through ballot initiatives.

More than one in three women of reproductive age (15–44) live in a State with an abortion ban (Shepard, Roubein, and Kitchener

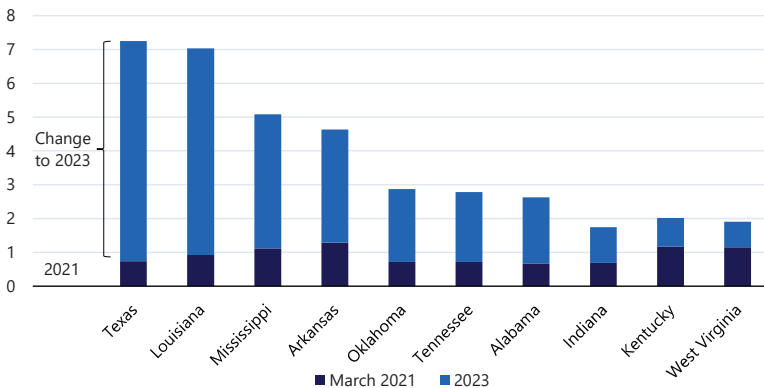
2022; Myers et al. 2023). Although these laws vary by State, millions of women currently live in a State with a total ban; other States may allow access to abortion in very limited circumstances, such as when a woman’s health is at risk or when the pregnancy is a result of rape or incest. In these and other States with abortion restrictions, health clinics that provide contraception and other essential health services have shuttered, eliminating critical points of care, including for other forms of reproductive health care (McCann and Walker 2023; Nash and Guarnieri 2022). State bans are also influencing medical professionals’ geographic decisions over residency and practice plans (Edwards 2023; Woodcock et al. 2023), adding to the potential for shortages in the obstetrics and gynecology workforce in these States.

Because State abortion bans have eliminated or severely restricted access to abortion in many States, many women have been forced to travel across State lines to get the care they need. Figure 3-i shows the average travel time faced by women seeking abortion care from certain restrictive States, based on data from Myers and others (2023). The figure compares access from March 2022, which was before the *Dobbs* decision was issued, to September 2023. Because a large contiguous block of southern States has abortion bans in effect, travel times to the nearest provider have more than tripled in several southern States (this figure does not account for any potential international travel).

Appreciating the historic linkage between access to reproductive health care and economic opportunities, family formation, and fertility patterns since the 1970s (Myers 2017; Goldin and Katz 2002), it is

Figure 3-i. Changes in Travel Time to Nearest Provider, 2021–23

Average travel time in driving hours



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Sources: Abortion Access Dashboard; CEA calculations.

Note: Driving times have been weighted by the reproductive-age female population. This figure does not account for potential international travel.

2024 Economic Report of the President

important to understand what effects the *Dobbs* decision could have on these outcomes. Research has shown that when women are denied an abortion, that denial has serious consequences for their well-being and results in adverse financial circumstances and family outcomes (Foster et al. 2018; Foster 2021; Miller, Wherry, and Foster 2023). For women who have been able to access abortion care since *Dobbs*, there may have been added economic, social, and personal costs due to longer travel, stress, delay, expense, and time away from work (Lindo and Pineda-Torres 2020). Finally, abortion restrictions also pose significant risks for maternal health, including the health of women who experience miscarriages, ectopic pregnancies, or other pregnancy complications and may be denied or receive delayed care—ultimately threatening their health and lives (Howard and Sneed 2023; Sellers and Nirappil 2022).

To address the devastating consequences that the *Dobbs* decision has had on women across the country, the President has called on Congress to pass a Federal law restoring the protections of *Roe v. Wade* (White House 2022c). In the meantime, the Biden-Harris Administration has taken executive action to protect access to the full spectrum of reproductive health care. In the wake of *Dobbs*, the President issued two Executive Orders and a Presidential Memorandum directing a comprehensive slate of actions to protect access to reproductive health care services, including access to emergency medical care and medication abortion. In June 2023, the President issued a third Executive Order to strengthen access to high-quality, affordable contraception, a critical aspect of reproductive health care (White House 2023g). The Administration remains fully committed to implementing these directives and defending reproductive rights.

While the effects of the *Dobbs* decision on the health and well-being of women are clear, the loss of abortion access resulting from the decision may ultimately have only a small effect on birthrates. The Congressional Budget Office estimates a roughly 1 percent increase in birthrates annually as a result of the new legal landscape (CBO 2023a). The relatively small impact on aggregate birthrates is in part due to anticipated changes in patterns of sexual behavior, contraception use, and how people access abortion care. Early research analyzing the effects of the *Dobbs* decision suggests that roughly three-fourths to four-fifths of people seeking abortions in the first half of 2023 were able to obtain them, despite bans (Dench, Pineda-Torres, and Myers 2023). In the aggregate, early data suggest that U.S. abortions were above pre-*Dobbs* levels one year after the decision (WeCount 2023), despite the added hardships and barriers to care erected in States where abortions are banned.

funds stabilized employment for childcare workers, reduced out-of-pocket expenses for families paying for care, and helped hundreds of thousands of mothers enter the workforce or return to work (CEA 2023a). In the President’s Fiscal Year 2024 Budget, he called for \$400 billion over 10 years to dramatically expand access to childcare for families with young children, while increasing childcare workers’ pay. Under the President’s plan, most families would pay no more than \$10 per day for childcare. In April 2023, the President also signed a historic Executive Order directing his Administration to expand access to affordable, high-quality care and provide increased support for care workers and family caregivers through existing Federal programs (White House 2023a).

Mortality: Uneven Progress in the 21st Century

Mortality rates are critical determinants of the population’s age structure, and thus have an impact on aggregate economic outcomes. But more importantly, longevity is intrinsically valuable. To quote Cutler, Deaton, and Lleras-Muney (2006, 97): “The pleasures of life are worth nothing if one is not alive to experience them.”

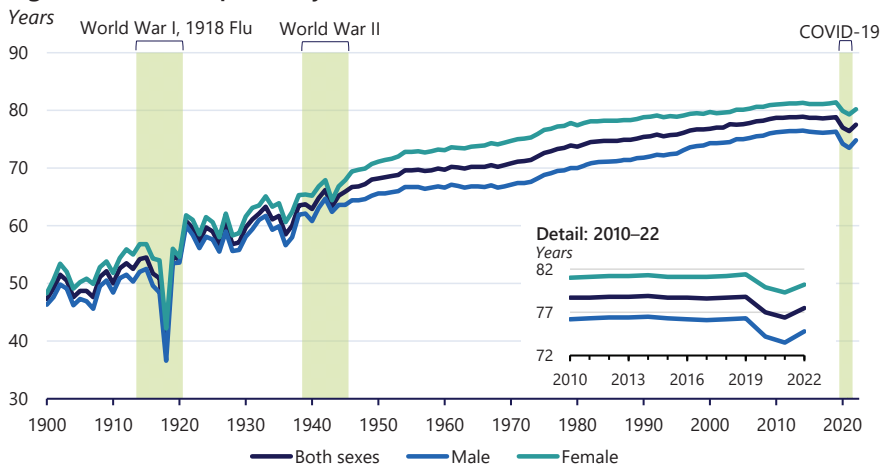
U.S. life expectancy has increased by nearly 30 years since the turn of the 20th century.⁴ The escape from premature death to longer, healthier lives is an accomplishment built on improvements in knowledge, nutrition, sanitation, and public health infrastructure (e.g., childhood vaccinations), as well as advances in medical science targeting chronic disease (Deaton 2014). Senior Americans are living longer than in past decades, and infant or childhood death, which was commonplace in the United States a century ago, is now a rare tragedy. Figure 3-4 charts this progress.⁵

Although the long arc of progress is clear, longevity improvements have stalled in recent years. Over the decade before the COVID-19 pandemic, life expectancy was essentially flat, as shown in the figure 3-4 detail. The stall does not reflect an upper biological limit on longevity. Life expectancies in other advanced economies have continued to increase above the U.S. level (Schwandt et al. 2021; Heuveline 2023). The patterns of U.S. mortality over the past decade are nuanced. Young and middle-age U.S. adults have experienced mortality setbacks due to increases in deaths from external causes, including guns, vehicle accidents, and drug overdoses. Gun deaths among children have risen and are now the leading cause of death among children

⁴ For a given population, life expectancy captures how long members of a hypothetical cohort would live on average if its members were exposed to the population’s mortality risks over their lifetimes.

⁵ Figure 3-4 shows that the annual variability in life expectancy declined after the 1940s. Reductions in parasitic and infectious diseases, the introduction of commercially available penicillin, and the distribution of the first civilian flu vaccines in the United States were all likely contributors. But a change in how life expectancy data were calculated beginning in 1948 is responsible for some of the declining variance and renders pre and post comparisons difficult (Smith and Bradshaw 2006).

Figure 3-4. Life Expectancy at Birth, 1900–2022



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Source: National Center for Health Statistics.

Note: The data for 2022 are provisional.

2024 Economic Report of the President

and teenagers 1 to 19 years of age (CDC 2023a). Meanwhile, seniors and infants have experienced continuing, gradual mortality improvements. The net effect of these forces, among others, was essentially unchanged male and female life expectancy for several years before the onset of the COVID-19 pandemic.

U.S. mortality trends are driven by three broad cause-of-death categories: infectious disease, external causes, and chronic illness.⁶ All three categories are amenable to public interventions that can help improve longevity, though each requires different policy responses.

Infectious Disease: The Importance of Vaccinations

For much of the past century, deaths from infectious disease have declined. Influenza and pneumonia deaths per capita have decreased nearly 80 percent since 1950. Infant and child mortality rates from infectious disease have been especially responsive to public policy, driven down by childhood vaccinations and other public health infrastructure improvements, including in sanitation, water filtration and chlorination, and public education on infant care and hygiene (Cutler and Miller 2005; Cutler, Deaton, and Lleras-Muney 2006; Bhatia, Krieger, and Subramanian 2019). (See box 3-4.)

COVID-19 caused a major setback in infectious disease mortality. Total U.S. deaths increased by 19 percent from 2019 to 2020 when the

⁶ External causes of death, per the definition from the Centers for Disease Control and Prevention (CDC), include unintentional injury, poisoning (including overdose), and complications of medical or surgical care (CDC 2019b).

pandemic began, causing life expectancy to fall abruptly ([Sabo and Johnson 2022](#)). Life expectancy fell for a second year, from 77.0 in 2020 to 76.4 in 2021, before rebounding to 77.5 in 2022 ([Xu et al. 2022](#); [Arias et al. 2023](#)).

The United States' experience in responding to COVID-19 illustrates the role policy and public health authorities play in controlling infectious disease. Upon taking office, the Biden-Harris Administration immediately accelerated and improved vaccine distribution planning, resulting in the largest adult vaccination program in U.S. history and leading to 270 million individuals receiving a COVID-19 vaccine by May 2023. Federal efforts also helped distribute 750 million free COVID-19 tests by shipping them directly to 80 million households ([HHS 2023a](#)).

After the Biden-Harris Administration's successful vaccine and booster rollout, COVID-19 deaths slowed dramatically. Today, the public health emergency seems to be exiting its acute phase. COVID-19 hospitalizations were down 91 percent from January 2021 to May 2023, and deaths were down 95 percent over the same period ([HHS 2023a](#)). At the pandemic's peak, weekly COVID-19-related deaths reached almost 26,000. As of September 2023, this number was about 1,400 ([CDC 2023b](#)).

Progress has also continued against other sources of infectious disease mortality. Respiratory syncytial virus (RSV) is a highly contagious virus that causes illness and up to 10,000 deaths annually in the United States, primarily among infants and seniors ([CDC 2023c](#)). In May 2023, the Food and Drug Administration approved the world's first RSV vaccine. It approved a second vaccine later the same month. These advances promise continued mortality reductions for infants and senior citizens, including by protecting infants with vaccines administered to mothers during the in-utero period ([Fleming-Dutra et al. 2023](#)).

Unfortunately, vaccination, one of the most potent tools available to combat infectious disease, has become politically polarized and surrounded by misinformation. Vaccine skepticism is also a headwind to continued improvement in infant and child well-being. Although 88 percent of Americans maintain confidence in the net benefits of child vaccinations for measles, mumps, and rubella ([Funk et al. 2023](#)), there are worrying signs. In a poll assessing support for mandatory measles, mumps, and rubella vaccinations among schoolchildren, the trend was essentially flat at high levels in recent years for Democratic and Democratic-leaning respondents but down from 79 to 57 percent between October 2019 and March 2023 for Republican and Republican-leaning respondents ([Funk et al. 2023](#)).

Continuing long-run improvements in the health of American families will require maintaining public health priorities like the Biden-Harris Administration's emphasis on childhood and senior vaccinations. Today, the Administration continues ongoing, cross-agency efforts to combat misinformation, offering vaccine education and outreach efforts in rural

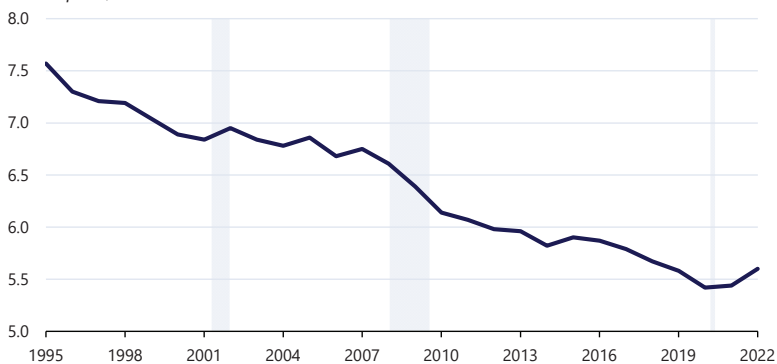
Box 3-4. Infant and Maternal Mortality

The story of early life mortality in the United States is one of continual, if uneven, progress. Infant mortality—the number of deaths in the first 12 months of life occurring for every 1,000 live births—has declined since the late 19th century (Lee 2007). In the early 1900s, the infant mortality rate was 100 (CDC 1999), meaning that 1 out of 10 children died in their first year of life. By 2021, the most recent year for which complete data are available, the rate had declined nearly 95 percent, to 5.4 (Ely and Driscoll 2023). Broadening the scope to early child mortality beyond infancy reveals a similar pattern: At the turn of the 20th century, more than 20 percent of U.S. children did not live to age 5, while today the share is less than 1 percent (Gapminder 2022). Figure 3-ii charts infant mortality since the mid-1990s, showing that the 2022 rate was 19 percent lower than it was two decades earlier (Ely and Driscoll 2023).

U.S. infant mortality has demonstrated a steady decline over the past decades and, despite a rise from 5.44 to 5.60 between 2021 and 2022, remains near its historic low. It is still unclear what role the COVID-19 public health emergency has played in the recent uptick. Yet the United States lags behind other advanced economies on this metric (Bronstein, Wingate, and Brisendine 2018). The United States has the sixth-highest infant mortality rate among countries that belong to the Organization for Economic Cooperation and Development (OECD 2021). In 1999, before the COVID-19 pandemic’s health care disruptions and social upheavals, the U.S. infant mortality rate was 5.58 (Ely and Driscoll 2023). Other advanced economies had infant mortality rates

Figure 3-ii. U.S. Infant Mortality Rate, 1995–2022

Deaths per 1,000 births



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Source: Centers for Disease Control and Prevention.

Note: The death rate is deaths per 1,000 live births. Gray bars indicate recessions.

2024 Economic Report of the President

that were substantially lower; for example, 1.9 in Japan and 3.7 in the United Kingdom (OECD 2021).

The United States performs similarly poorly in international comparisons of maternal mortality (i.e., deaths of pregnant and postpartum women for every 100,000 births). Maternal mortality accounted for about 1,200 U.S. deaths in 2021, compared with about 100,000 overdoses and 700,000 heart disease deaths during the same year. The rate nearly doubled from 2018 to 2021, going from roughly 17 to 33 deaths per 100,000 live births, though the contribution of COVID-19 to this trend is yet unclear (Hoyert and Miniño 2023). (Maternal mortality statistics from earlier years are not directly comparable due to a data coding change; see NVSR 2020. Previously reported increases in maternal mortality over the period 2002–18 were an artifact of new coding practices that were slowly diffusing across States, rather than reflective of an actual worsening of mortality in consistently applied calculations; see Joseph et al. 2021.)

What explains the relatively poor outcomes for babies and mothers in the United States? Researchers have noted that cross-country differences in birthweight and gestational age account for a significant share of the infant mortality gap (Chen, Oster, and Williams 2016). Because infant health indicators like birthweight are often indicative of mothers' well-being during gestation, the results point to the importance of maternal health.

Black women have alarmingly high rates of maternal mortality, two to three times the rate of white women, and have experienced the largest increase in the rate in the past several years (Hoyert and Miniño 2023). Poverty contributes to both infant and maternal mortality (Turner, Danesh, and Moran 2020; Kennedy-Moulton et al. 2023), but, critically, differences in infant and maternal health across racial and ethnic groups cannot be explained simply by differential poverty incidence. Elevated mortality among U.S. Black women and their infants is greater than can be accounted for by income (Kennedy-Moulton et al. 2023). Research suggests that a combination of higher likelihood of preexisting conditions, higher likelihood of adverse pregnancy outcomes, and racial bias/discrimination all contribute to higher Black maternal mortality (Lister et al. 2019).

Recognizing the importance of maternal health, and the gaps in our understanding of women's health more broadly, the Biden-Harris Administration released a blueprint for addressing maternal mortality and reducing these disparities in 2022 (White House 2022d).

Progress on maternal health and closing racial mortality gaps is possible. Black Americans experienced significant mortality improvements across age, sex, and cause-of-death categories during the two decades beginning in 1990, especially in low-income areas (Schwandt

et al. 2021). This progress shrank the Black/white mortality gap even as white mortality also improved. Improved access to health care is critical, and the Biden-Harris Administration is committed to improving maternal health and expanding insurance coverage. The American Rescue Plan, which was signed into law by President Biden, established a new State option to extend Medicaid coverage for low-income postpartum women from 60 days after childbirth to one year (White House 2021). As of December 2023, 41 States and D.C. have implemented the one-year postpartum coverage extension, and extensions are pending in several other States (KFF 2024).

communities (HHS 2021; White House 2022a). The Administration has also worked to reduce financial barriers to vaccines, including via the Inflation Reduction Act's provision to remove cost sharing among Medicare Part D and Medicaid beneficiaries for all adult vaccines recommended by the Centers for Disease Control and Prevention (CDC).

External Causes: Setbacks in Midlife Mortality

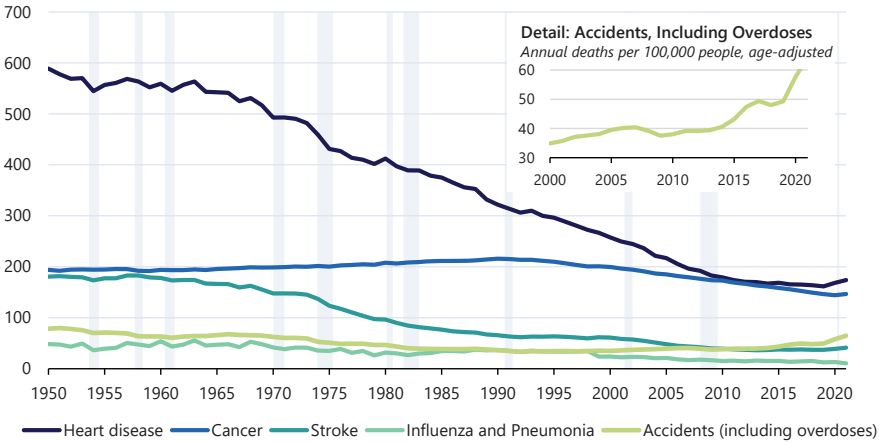
Whereas infectious disease disproportionately affects the very young and old, deaths from external causes disproportionately affect older children and middle-aged adults. This contrast highlights the difficulty in telling a simple, singular story of mortality trends in America. Today, rates of death from external causes—which include motor vehicle accidents, homicides, suicides, and drug overdoses—are rising for young and middle-aged people in the United States. Drug overdose deaths have risen in recent years to become the largest category within the external cause group (Lawrence et al. 2023; CDC WONDER n.d.). In 2021, drug overdoses were the leading cause of death for Americans between age 25 and 44 and the fourth leading cause for those between 45 and 64, after cancer, heart disease, and COVID-19 (CDC WONDER n.d.).

Figure 3-5 charts changes in mortality across all age groups due to accidents and overdoses, along with other leading causes of death. External causes, which have received significant attention due in part to pioneering work by Case and Deaton (2015), are the largest category of deaths among individuals between age 1 and 44. The rising trend in overdoses and accidental deaths apparent in figure 3-5 is a matter for serious public concern.

Research has found that the history of widespread legal opioid prescription is driving the present U.S. overdose epidemic (Cutler and Glaeser 2021). The increase in opioid deaths in the mid-1990s was linked to aggressive promotional targeting of OxyContin by pharmaceutical companies to

Figure 3-5. Selected Leading Causes of Death, 1950–2021

Annual deaths per 100,000 people, age-adjusted



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Sources: National Center for Health Statistics; Centers for Disease Control and Prevention WONDER.

Note: Accidents refer to all "unintentional injuries," which include accidental overdoses. Gray bars indicate recessions.

2024 Economic Report of the President

States with less prescription oversight and more prescribers than their peers (Alpert et al. 2022; Arteaga and Barone 2023). Researchers further found that competition for patients among health care professionals led to looser opioid prescriptions (Currie, Li, and Schnell 2023).⁷

Even as State and Federal policymakers began to recognize opioids' harm and address their overprescription and abuse, demand for opioids remained strong because of the group of people already suffering from addiction. The demand fueled an increased supply of prescription opioid substitutes—first heroine, and later fentanyl (Giltner et al. 2022; Alpert, Powell, and Pacula 2018). And the shift in supply to more dangerous illegal opioids accelerated fatal overdose rates (Lancet 2022).

The Biden-Harris Administration's National Drug Control Strategy makes saving lives the Administration's "North Star" (White House 2022b). Several medicines approved by the U.S. Food and Drug Administration are effective in treating opioid use disorder. Seeking and receiving treatment, including Medication Assisted Treatment, is associated with significantly improved outcomes (Mancher and Leshner 2019). Promoting widespread availability of treatment and helping individuals successfully navigate into treatment is a critical component of the Administration's strategy. Further, in March 2023, the Food and Drug Administration approved the first

⁷ One paper finds that physicians with stricter prescribing standards become more careful about prescribing opioids when diversion—the possibility of misuse either by a patient or a different unintended user—is a risk (Schnell 2022). These findings suggest an important role of physicians with more lax prescribing standards.

over-the-counter naloxone nasal spray, which has been shown to be a critical tool for preventing fatal opioid overdoses (HHS 2023b). In August 2023, the Biden-Harris Administration announced \$450 million in new funding to tackle opioid-related overdose deaths (White House 2023b); more than \$80 million will help rural communities respond to overdose risks (HHS 2023c).

Chronic Disease: Progress Through Innovation and Health Care Access

Chronic disease still claims the most American lives each year. While external causes of death matter most before age 45, most deaths occur after 45, when chronic disease dominates as the leading cause. Historically, progress against chronic disease has depended on advances in medical innovation and health insurance coverage that makes effective treatment accessible.

Heart disease deaths declined in the second half of the 20th century (see figure 3-5). Health behavior trends, particularly reductions in smoking, played an important role (Cutler, Glaeser, and Rosen 2009; CDC 2014; DeCicca and McLeod 2008; Evans, Farrelly, and Montgomery 1996). Innovation also led to new medicines to control hypertension and cholesterol and new treatments like stents and bypass surgeries. Longer lives from fewer heart disease deaths were initially accompanied by a slow rise in cancer deaths. Cancer death rates peaked in 1991, both as a consequence of smoking trends (ACS 2023) and because declines in heart disease allowed people to survive longer, exposing them to additional cancer risk (Honore and Lleras-Muney 2006). Since the 1990s, cancer deaths have declined. Still, the disease remains the second leading cause of death for people age 65 and above across all race and ethnicity groups and for both men and women.

Progress on chronic disease mortality has been positive, though slow and uneven, in the past decade. Overall mortality and life expectancy above age 65 improved from 2010 to 2019, before the COVID-19 public health emergency. Further progress is possible, and the Biden-Harris Administration has led several initiatives aimed at addressing chronic disease. President Biden's Cancer Moonshot initiative affirms the critical work of continuing progress against cancer, including expanding access to and technology for screenings, building on the successful human papillomavirus vaccine to prevent cancers before they start, and strategically allocating Federal funds. The Cancer Moonshot also expands the U.S. Patent and Trademark Office's program to expedite patents for cancer treatment innovations (White House 2023c).

In November 2023, President Biden established the first-ever White House Initiative on Women's Health Research (White House 2023d) to address the consequences of the historic underfunding of research on women's health, especially for communities that have been historically

excluded from research, including women of color and women with disabilities (White House 2023e). The initiative will address midlife health and chronic conditions connected to aging, among other areas. Decades of research based on men has led to significant research gaps in women's health compared with men's, masking differences that can be critical for women's health outcomes—for example, because women and men experience different heart attack symptoms, traditional diagnostic tools geared toward men can lead to misdiagnoses for women (Mehta et al. 2016).

Medical treatment can only benefit those who receive it, which highlights the importance of health insurance coverage for progress on morbidity and mortality. There is now a large body of research evidence that health insurance expansions in general—and the specific health insurance expansions created by the Affordable Care Act (ACA) and supported by the Biden-Harris Administration—have improved health and saved lives. Earlier Medicaid expansions were found to reduce infant and child mortality (Currie and Gruber 1996; Goodman-Bacon 2018), and researchers have shown that the ACA's expansions of Medicaid and Marketplace coverage have reduced adult mortality (Goldin, Lurie, and McCubbin 2021; Miller, Johnson, and Wherry 2019). Further, a wider body of work has documented improvements, resulting from the ACA, in health care access and utilization; self-reported physical and mental health; chronic disease; and maternal and neonatal health (Guth, Garfield, and Rudowitz 2020; Soni, Wherry, and Simon 2020).

The Biden-Harris Administration is committed to ensuring health care access through expanded insurance coverage. In early 2023, the share of individuals with no health insurance coverage fell to an all-time low of 7.7 percent (HHS 2023d). Today, Insurance Marketplace enrollment is at an all-time high, thanks in part to the Inflation Reduction Act's enhanced subsidies for purchasing coverage.

Aging and the Economy

Birth, death, and net migration patterns determine a population's age structure. Today, the U.S. population is aging; the age profile of the population is shifting toward relatively fewer younger people and more seniors than in past decades. Aging societies present challenges, including in terms of funding social insurance systems, meeting seniors' social and infrastructure needs, and adapting to a reduced labor force as a share of the overall population.

The United States is not alone in facing these challenges. Societies around the world are aging because of low fertility rates (World Economic Forum 2022). During the rapid population growth characterizing most of the 20th century, most advanced economies' population age distributions

were bottom heavy, featuring a large share of young people and tapering at increasingly old ages. The demographic transition to low fertility and mortality implies that the United States now faces an age distribution more heavily tilted toward older ages. The result is an age “pillar,” rather than the “pyramid” of the past. Figure 3-6 shows the near-term aging challenge the United States faces. Whereas the over-65 population was 12 percent of the total in 2000, it is expected to account for 21 percent in 2040.

Confronting Sustained Low Fertility

All forecasts contain uncertainty, which can compound for population projections extending several generations into the future.⁸ Yet, over time frames of 10 to 20 years, population projections can be made relatively precisely.⁹ Unforeseen social and economic changes may affect long-term desired family sizes and mortality rates, but the most likely near future for the United States is one of sustained low fertility and an aging population, similar to what is shown in figure 3-6.

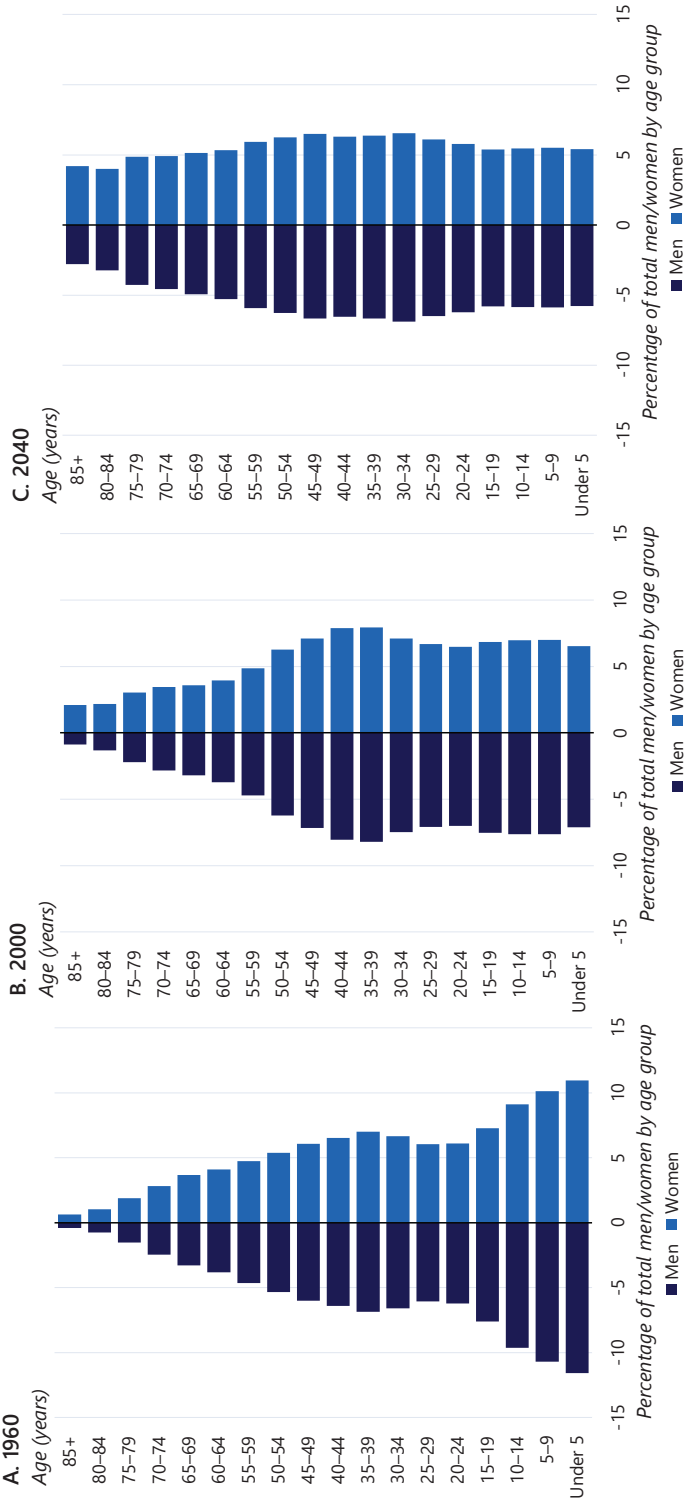
Population forecasters do not anticipate a significant rebound in fertility rates, with the U.N. World Population Prospects’ medium projection estimating U.S. TFR holding at 1.71 by the end of the century (U.N. DESA 2022b), about equal to the 2022 rate. Similarly, the Congressional Budget Office (CBO) projects no substantial rebound to above-replacement fertility. It projects that fertility rates through the middle of the century will level off at 1.7 (CBO 2024). The Census projects fertility to decline further, slowly converging to 1.52 over the next 100 years (Census 2023a). While the United Nations, CBO, and Census differ in the details of their assumptions and methodologies, they all imply a 2040 population pillar like the one shown in figure 3-6.

There are several convergent reasons to plan for the possibility of sustained low fertility embodied in these projections. First, the phenomenon of low fertility is partially rooted in social and economic progress, including improved educational and labor market opportunities. The direct costs and opportunity costs of childbearing and parenting are likely to persist. Second, the projections for the U.S. to remain below replacement are consistent with earlier fertility trends in Europe and East Asia. Finally, in recent years, U.S. fertility projections have tended to be revised downward, not upward, over

⁸ For example, technological breakthroughs in geriatric medicine could extend longevity beyond current projections and further invert the age pyramid.

⁹ Over time frames of 10 to 20 years, the already-existing population tends to determine population forecast outcomes in predictable ways. For example, there is little room for error in projecting the number of people 50 years of age a decade from now, based on the population of those 40 today, given the already-low mortality rates in the relevant age interval. The U.N. population projections used in this chapter have been shown to be relatively precise (Ritchie 2023) over these forecasting time frames.

Figure 3-6. U.S. Age Distributions for Men and Women



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Sources: Census Bureau; Congressional Budget Office; CEA calculations.
 Note: Data for 2040 are from long-term demographic projections.
 2024 Economic Report of the President

time. For example, in 2012 the United Nations projected that long-run U.S. TFR would converge to 2.0, but updated this to 1.7 in 2022 ([U.N. DESA 2012, 2022a](#)). The CBO's 2019 demographic outlook placed long-run TFR at 1.9 but updated this to 1.7 in its 2024 outlook ([CBO 2019, 2024](#)). The Census's 2017 projection included a national convergence to a TFR of 2.0, but updated this to 1.5 in 2023 ([Census 2018, 2023a](#)). For these reasons, below-replacement fertility in the United States may persist, as it has in most of the world's advanced economies. Policy deliberations and decisions should be made with these dynamics in mind.

A Role for Immigration in Filling Workforce Gaps

One immediate implication of the changing age distribution is a slowdown in U.S. labor force growth. The size of the labor force is consequential along a number of dimensions. Because labor force growth and productivity growth are components of the economy's capacity growth rate, a labor force that is growing more slowly implies slower overall growth.¹⁰ The labor force also constitutes a large part of the tax base supporting U.S. entitlement programs. Between 2023 and 2052, the population age 25 to 54 is projected to grow at an average annual rate of 0.2 percent, well below its 1 percent growth between 1980 and 2021. This rate is also below the senior population's projected 1.2 percent growth between 2023 and 2052 ([CBO 2022](#)).

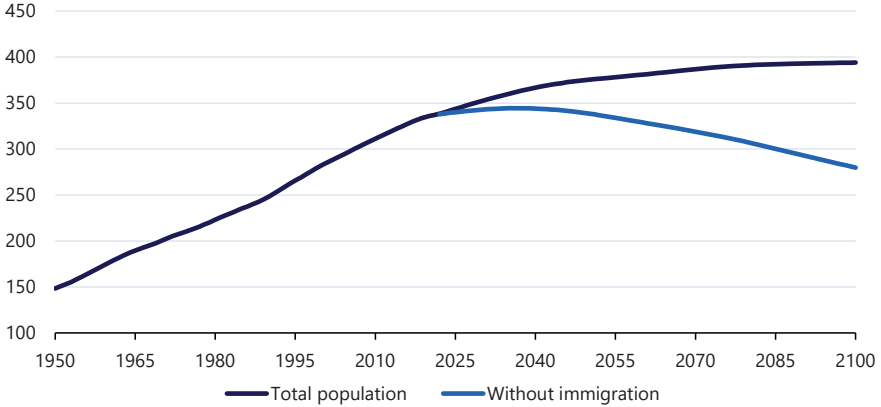
Historically, immigration has contributed to smaller occupational and geographic labor force gaps. The foreign-born population in the United States is responsive to local employment shocks and differential employment growth across labor markets ([Blau and Mackie 2017](#)), driven by immigrants' relatively high geographic mobility ([Basso and Peri 2020](#)). Since the COVID-19 pandemic, foreign-born workers have been critical across industries, particularly food services and agriculture ([CEA 2023b](#)). They also help fill essential positions that are often not filled by local workers due to skill mismatch, among other issues ([Hooper 2023](#)), and they facilitate labor market participation among high-skilled native U.S. women by starting new companies, creating new jobs, and lowering the price of market-provided household services ([Azoulay et al. 2022; Cortés 2023](#)).

Patterns of recent immigration and U.S. fertility have combined such that recent labor force growth has been—and anticipated future growth will be—substantially attributable to foreign-born workers. Between 2000 and 2017, 43 percent of U.S. labor force growth was attributable to immigrants ([Basso and Peri 2020](#)). Immigrants contribute to the U.S. labor force beyond the proportion of their total numbers because they are more likely to be of

¹⁰ For a fixed productivity growth path, a slower-growing labor force implies lower per capita GDP growth if the labor force declines as a fraction of the population. In other words, what matters for GDP per capita is the number of workers per capita, a metric that is declining in an aging population (see figure 3-8).

Figure 3-7. Total Population through 2100

U.S. population, millions



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Sources: United Nations World Population Projections (2022), medium variant.

Note: The medium variant estimation was used to compute immigration population projections.

2024 Economic Report of the President

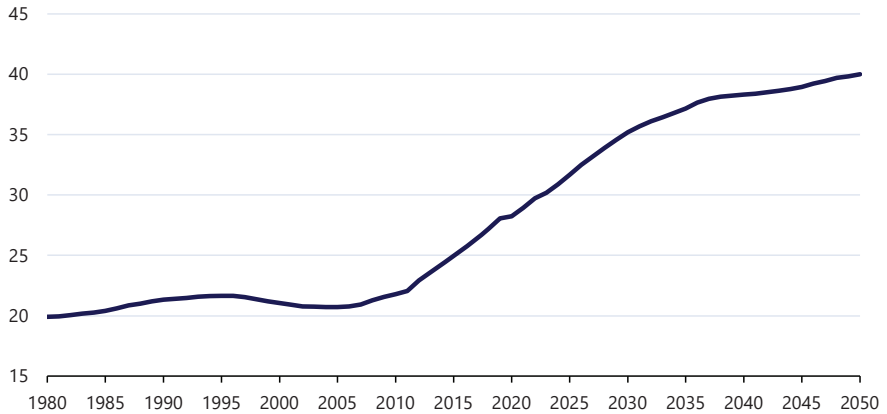
working age and have full-time jobs than their U.S.-born peers. In 2016, 78 percent of immigrants were between 18 and 64 years of age; meanwhile, 59 percent of individuals born in the United States were in that age group (Vespa, Medina, and Armstrong 2020).

Figure 3-7 shows the projected U.S. population with and without net migration through the end of the century. The population would begin shrinking within 14 to 16 years in the absence of immigration—in 2038, based on U.N. projections (pictured); and in 2040, per CBO projections (CBO 2024). If immigration follows the pattern of past decades, the U.S. population would reach nearly 400 million at the end of the century.

Overall, immigration generates important net benefits for the U.S. economy, including through positive effects on productivity, entrepreneurship, and scientific innovation (Hunt and Gauthier-Loiselle 2010; Peri 2012; Prato 2022; Azoulay et al. 2022). Nonetheless, immigration’s costs and benefits can be distributed unequally among stakeholders and regions (Hooper 2023). Although most studies have found that the wage effects of immigrants on natives are small and on either side of zero, immigration may place downward pressure on the wages of some low-paid workers (Butcher and Card 1991; Borjas 2003; Card 2009; Peri and Sparber 2009; Ottaviano and Peri 2012). While the country as a whole benefits from the economic activity and productivity boost immigration provides, local areas with recently arrived immigrants or immigrants with relatively lower educational attainment are likely to face immediate fiscal costs due to lower tax revenue generated per capita and additional draws on public services, especially

Figure 3-8. U.S. Old Age Dependency Ratio through 2050

Number of seniors age 65+ for every 100 people age 20–64



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Sources: Census Bureau; Congressional Budget Office; CEA calculations.

Note: The dependency ratio is calculated as the number of people age 65 years and over for every 100 people age 20–64. 2024 *Economic Report of the President*

K-12 education (Edelberg and Watson 2023; Blau and Mackie 2017). The Biden-Harris Administration recently took steps to extend the Temporary Protected Status of Venezuelan migrants and accelerate work authorization processing. This policy ensures that migrants can build sustainable lives and enter the formal work sector, where they can contribute to State and local income tax bases.

The Old Age Dependency Ratio: A Race Between Aging and Productivity Growth

An aging population increases pressure on Federal deficits and debts (Sheiner 2018). As people age and retire, they shift from contributing to government revenue via taxes paid on labor income to receiving Social Security and Medicare benefits. The lifecycle patterns and the country’s evolving age structure complicate issues of fair resource allocation across generations. At the birth-cohort level, Social Security retirement support pays out roughly the amount each generation contributes, though progressive redistribution occurs within generations (Steuerle, Carasso, and Cohen 2004; Steuerle and Smith 2023). Through Medicare, individuals receive significantly more on average over a lifetime than they pay in via taxes (Sabelhaus 2023; Steuerle and Smith 2023), largely because medical technologies and treatments improve rapidly over time, raising the standard of care and real spending.

Figure 3-8 depicts one of the central forces governing the relationship between the population’s age structure and benefit program financing. The old age dependency ratio, defined here as the number of individuals age

65 years and over for each 100 people age 20–64, has increased rapidly in recent years with the baby boom generation’s ongoing retirement.¹¹ Between 2024 and 2050, this ratio will increase by 30 percent. After that, it will likely continue to increase, though more slowly, nearly doubling between 2024 and the end of the century.

The extent of the fiscal challenge posed by the old age dependency ratio depends not only on the share of working age people in the labor force but also on workers’ productivity. Labor productivity is measured by the economic output generated for each hour worked. It grows over time with human capital improvements, labor-augmenting physical capital, and technological progress, making society wealthier per capita.

How will changes in the U.S. old age dependency ratio likely compare with changes in productivity growth? Many observers have noted a recent slowdown in productivity growth (e.g., [Syverson 2017](#); [Dieppe 2020](#)), and some evidence suggests that an aging population decreases the pace of productivity gains ([Maestas, Mullen, and Powell 2016](#)), including by reducing startup activity ([Karahan, Pugsley, and Şahin 2019](#)). Yet even modest productivity growth could outpace the dependency ratio’s growth. For example, labor productivity in the nonfarm business sector in 2023 was 1.5 times its value in 2000 ([BLS 2023a](#)), meaning that an hour of labor today produces 50 percent more output than an hour of labor in 2000. This implies an annualized 1.8 percent rate of real growth over this period. The Bureau of Labor Statistics projects that labor productivity growth will be slightly lower, at 1.7 percent, from 2020 to 2030 ([BLS 2021](#)). Either growth rate would dramatically outpace the 30 percent old age dependency ratio increase expected by 2050, an annualized change of 0.8 percent. Thus, even very modest labor productivity growth acts as an important countervailing force to concerns about dependency ratios.¹² Box 3-5 discusses the role of human capital investments in productivity growth.

Economic growth theory suggests that unprecedented U.S. and global population decline may also have important scale effects. The historical timing of global population growth (over humanity’s long history) corresponds closely with per capita productivity growth. Growth theorists consider the link important: “Virtually all theories of economic growth predict a positive

¹¹ This standard definition of the old age dependency ratio uses available binned age data. It is meant to proxy, rather than exactly describe, average working lifetimes. For example, it ignores that the normal retirement age for persons born in 1960 and later is 67 and that age 20 is an imprecise marker for when full-time labor force participation may begin.

¹² Nonetheless, a doubling of labor productivity would not imply that the tax revenue associated with a single worker could support twice as many seniors. That is in part because living standards and the costs of maintaining seniors also increase over time. For example, initial Social Security benefits are wage-indexed to reflect the general rise in the standard of living that occurred during an individual’s lifetime ([SSA 2023a](#)). Thus, real initial Social Security benefits increase over time as productivity rises.

relationship between population size and productivity” (Peters 2022, 1). Specialization, trade, and the nonrival nature of innovation and knowledge all imply channels running from larger populations to higher per capita living standards (Jones and Romer 2010). A key concept linking larger populations and rising per capita living standards is the production of nonrival goods (Romer 2018; Jones 2019), which are unique, in that one person’s use of them does not deplete the amount available to others. Such goods include knowledge, like germ theory and calculus, and practical inventions, such as water chlorination, internet communication protocols, and modified RNA vaccines (the first of which were approved and deployed in response to the COVID-19 pandemic). The total stock of knowledge and ideas therefore equals the per capita stock, and a world with a declining population may miss out on some critical innovations that make everyone better off (Jones 2022).

Declining population numbers also affect the intrafamily burden of care work. Aging populations need care, and the burden often falls on family members. Low fertility implies that a decreasing number of children and grandchildren can participate in the intergenerational compact of family care. For example, if the United States held at its present TFR of 1.66 indefinitely, then an average of 0.7 grandchildren would be born for every grandparent in the long run. This would be a different future of care than the past generations of Americans have experienced, on average. Technological advances, including artificial intelligence, may someday ease the strain, but the human burden of care remains an unsolved problem today (see box 3-6).

Aging and the Fiscal Outlook

Social Security and Medicare are the two main Federal assistance programs for seniors in the United States, though Medicaid plays an increasingly important role in long-term care as the payer for 6 in 10 nursing home residents (CBPP 2020). Entitlement programs are projected to be an important driver of long-term increases in fiscal outlays over the next three decades, accounting for more than 40 percent of noninterest spending in 2053, up from less than 30 percent in 2023 (CBO 2023b).

Today, Social Security provides income support to roughly one-fifth of the population, or 67 million beneficiaries. By 2050, about one-quarter of the population is expected to receive benefits, boosting Social Security spending to 6 percent of gross domestic product (GDP), up from 5.2 percent currently (SSA 2023b).

As a growing share of the population transitions from the labor force to retirement, total Medicare costs will also rise. Roughly one-third of the projected increase in health care program expenditures as a share of GDP through 2053 will be attributable to the population’s aging (CBO 2023b).

Box 3-5. Investing in Productivity through Human Capital

As the ratio of workers to the overall population declines due to age structure changes in the United States, the Biden-Harris Administration is committed to policies that accelerate productivity growth, facilitating more real output despite fewer workers. Investing in human capital via health and educational inputs during childhood is one of the clearest paths to increased productivity.

Research documents that educational investments in children and young people raise productivity and contribute to aggregate economic growth (Valero 2021; Hanushek and Wößmann 2010). High-quality childcare has also been shown to be important for outcomes such as school readiness, cognitive skill development, and employment and earnings in later life (Deming 2009; Duncan and Magnuson 2013; Campbell et al. 2014; Gray-Lobe, Pathak, and Walters 2022). Similarly, research has shown that providing health care to children through Medicaid and the Children’s Health Insurance Program has a positive impact on human capital and confers long-term benefits (Cohodes et al. 2016; Brown, Kowalski, and Lurie 2020; Miller and Wherry 2019; Goodman-Bacon 2021; Arenberg, Neller, and Stripling 2020). Early investments in human capital tend to compound, meaning that individuals who benefit from early investments gain more from later investment than they would have otherwise (Cunha and Heckman 2007; Johnson and Jackson 2019).

Consistent with these findings, a comparative analysis of public programs shows that policies directly investing in children at young ages—including via childcare, K-12 education, health care, and housing—offer the highest return on public investment (Hendren and Sprung-Keyser 2020). These policies tend to increase employment and earnings later in life, increasing tax revenue and/or decreasing government transfers. For example, even setting aside the direct benefits of Medicaid to its beneficiaries, Medicaid expansions to children often more than pay for themselves, affecting beneficiary productivity enough to net returns in excess of the initial program cost. Analysts estimate that Medicaid generates up to \$2 in discounted future tax revenue for each \$1 spent expanding the program to more children (Ash et al. 2023).

Given the productivity returns, investments in children are often a win-win. The Child Tax Credit is a critical direct investment. The failure of Congress to respond to the President’s call to renew the expanded Child Tax Credit for 2022 caused 3 million children to fall into poverty in 2022 (CEA 2023c). As the United States increasingly relies on improved labor productivity in the face of an aging population, disinvestments in children are a costly policy error.

Box 3-6. Long-Term Care

Demand for long-term care will be increasingly important as the U.S. population ages. Today, a mix of paid caregivers in long-term facilities and in-home and community-based services—as well as informal unpaid caregivers, who are often family members, friends, and neighbors—provide the country’s senior care (Osterman 2017). The care workforce is composed of more than 37.1 million unpaid (BLS 2023b) and 4.7 million paid providers (PHI 2022), with women constituting the majority (BLS 2022). In 2021, family caregivers’ unpaid economic contributions were valued at \$600 billion (Reinhard et al. 2023).

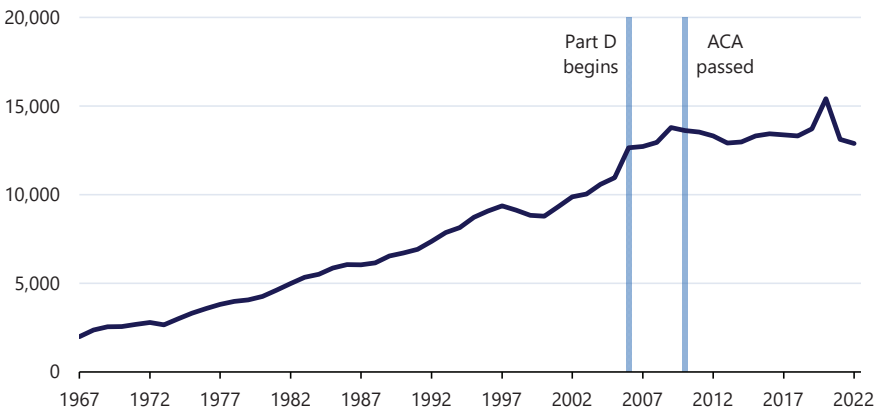
Addressing the needs of the senior population and younger family members supporting them requires providing better access to affordable institutional care and continuing to expand home and community-based services to best accommodate individual preferences.

As the primary payer for long-term care services, Medicaid has an important role to play. Home- and community-based services have grown from making up less than 20 percent of Medicaid’s long term care spending in 1995 to more than 50 percent today (Grabowski 2021). As of 2020, roughly 75 percent of the 5.6 million Medicaid long-term care enrollees used services under the home- and community-based services model (Chidambaram and Burns 2023). The Biden-Harris Administration has championed expanding home-based options in proposed budgets and Executive Orders. The Administration has also made historic investments in improving long-term care quality and standards (White House 2023a).

Long-term care improvements matter not only for seniors and their loved ones but also for the labor market. Increasing formal care access and affordability either in an individual’s home or a nursing facility helps alleviate the burden on unpaid caregivers and improves labor market participation (AARP 2020; Schmitz and Westphal 2017). With increased access to formal home-based care, adult children of parents in need are less likely to drop out of the labor force and more likely to work full time over longer periods than they otherwise would (Shen 2023; Coe, Goda, and Van Houtven 2023). One study finds that for every three daughters with a senior parent receiving formal home-based care through Medicaid, the substitution to formal care causes one daughter to work full time who would not have otherwise (Shen 2023). As long-term care demand rises, the Federal Government must therefore continue investing in caregiving to improve the senior population’s well-being and maintain a strong overall labor force.

Figure 3-9. Annual Medicare Spending per Beneficiary

2021 dollars



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Sources: Centers for Medicare and Medicaid Services 2023 Medicare Trustees Report; CEA calculations.

Note: ACA = Affordable Care Act. Per-beneficiary spending is calculated as total expenditures divided by total enrollment, including Parts A, B, C, and D. Deflated using CPI-U.

2024 Economic Report of the President

Medicare, with 86 percent of its recipients being at least 65 years of age, is projected to account for more than 60 percent of Federal health expenditures in 2053. Demographic changes will exacerbate budget deficits and the projected depletion of the Medicare and combined Social Security Trust Funds beginning 2031 and 2034, respectively (CMS 2023a; SSA 2023c).¹³ The trust fund calculations, however, rely on assumptions using current laws. Outside observers have suggested altering program structures in terms of revenues or benefits (e.g., Lee and Edwards 2002; Sheiner 2018). The Affordable Care Act of 2010 made such an adjustment via the Additional Medicare Tax on high earners, and the President’s 2024 budget proposed to increase taxes on earned and unearned income above \$400,000 as part of a package to further extend Medicare’s solvency (IRS 2024; U.S. Department of the Treasury 2023).

Against this backdrop, Medicare’s slower-than-expected spending in the past decade has been a fiscal bright spot. The growth rate in real Medicare spending per beneficiary declined from 6.6 percent between 1987 and 2005 to 2.2 percent between 2013 and 2019 (CBO 2023c). Figure 3-9 plots how Medicare spending per beneficiary has evolved over the past several decades.

Several phenomena have contributed to the slowdown in Medicare cost growth: lower-than-expected growth in prescription drug expenditures,

¹³ The combined Social Security Trust Fund refers to the Old-Age and Survivors Insurance Trust Fund and the Disability Insurance Trust Fund.

due to both generic drug entry after exclusivity expiration and the introduction of fewer new drugs (CBO 2023c); declines in hospitalizations for acute cardiovascular events, due in part to more effective medications (Cutler et al. 2019); a slowdown in the diffusion and adoption of expensive new health care technologies (Smith, Newhouse, and Cuckler 2022); and the influence of the ACA (Buntin et al. 2022). In particular, the ACA’s payment reforms for Medicare providers and private Medicare Advantage insurers were an important source of savings (White, Cubanski, and Neuman 2014; CEA 2016).

One way to understand the massive importance of this slowdown in cost growth is to consider the difference in future outlays between a scenario in which per capita Medicare spending is held at a projected real GDP per capita growth rate of 1.6 percent,¹⁴ and a scenario in which per capita Medicare spending resumes its 1980–2005 growth trend (a 3.5 percent annualized growth rate). The difference in trajectory, combined with the Medicare-supported population growing to 87 million by 2050, would add up to a difference of about \$14 trillion (in 2021 dollars) between 2024 and 2050 (CMS 2023b).

Real per capita Medicare spending growth has stalled, but this is unlikely to persist indefinitely. As medical technology advances, Americans will expect Medicare to cover expensive new treatments and cures that extend and improve life. Past growth in treatments and cures has been dramatic. For example, in 1960, when real per capita U.S. health care spending was less than 10 percent of what it is today (NHEA 2023), no doctor had ever performed an angioplasty to clear a blocked artery, administered combination chemotherapy to treat cancer, or been able to prescribe a biologic drug or synthetic insulin. The improvements since then have reduced mortality and allowed people with serious chronic conditions to live flourishing lives. The coming decades will likely bring similar breakthroughs, and society must plan for ways to pay for them.

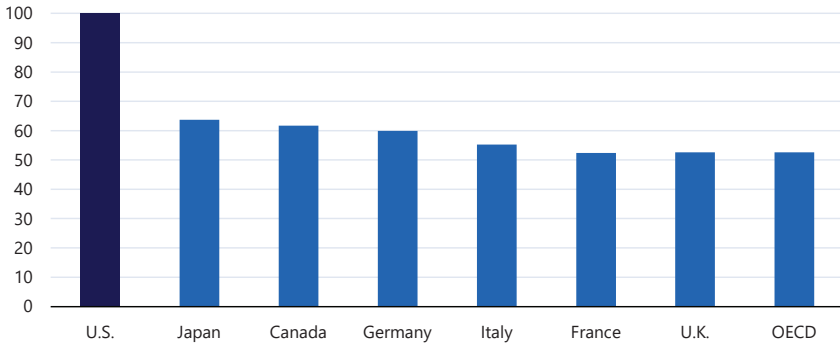
The Inflation Reduction Act is placing and will continue to place downward pressure on the drug component of Medicare spending. It requires drug companies to pay back Medicare if they raise prices faster than inflation. And beginning in 2026, Medicare will pay reduced negotiated prices for some drugs for the first time in the program’s history. This is an important advance, as the United States has historically paid twice as much as other advanced economies for the same pharmaceutical products (Mulcahy et al. 2022).¹⁵ Figure 3-10 compares drug prices in the United States and other

¹⁴ The projected real GDP per capita growth rate is based on a longer-term projection of the real GDP growth rate from CBO and population projections from the Census (CBO 2023b; Census 2023b).

¹⁵ The U.S. drug prices shown in figure 3-10 reflect estimates of net prices, subtracting estimated average rebates.

Figure 3-10. Global Prescription Drug Prices, U.S. Net Price Adjustment, 2018

Country-specific prescription drug prices versus U.S. drug prices; index: United States = 100



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Sources: Office of Assistant Secretary for Planning and Evaluation, Department of Health and Human Services; IQVIA MIDAS; CEA calculations.

Note: OECD = Organization for Economic Cooperation and Development. Here, “OECD” means 32 OECD comparison countries combined. U.S. prices are set to 100. Only some prescriptions sold in each country contribute to bilateral comparisons. In this figure, U.S. drug prices reflect estimates of net prices, subtracting estimated average rebates.

2024 Economic Report of the President

countries. The IRA-authorized negotiation process will use the United States’ leverage as an important customer to get concessions on price—just as other nations have long done, and as the Department of Veterans Affairs and Department of Defense have done for years (GAO 2013). The list of drugs subject to price negotiations will expand in the future, driving overall Medicare drug spending down and narrowing the gap between U.S. drug prices and those in other advanced economies.

Planning for the Demographic Future

Rates of birth, death, and migration will govern the demographic future of the United States, with wide-ranging effects (see box 3-7). Acute mortality crises, including the opioid epidemic and COVID-19, are amenable to policy solutions, and life expectancy improvements overall will depend on public health initiatives, medical innovation, and support for public and private insurance coverage. Future improvements in health and longevity are likely to move along two axes: (1) addressing the rise in deaths due to external causes, particularly drug overdoses; and (2) investing in the fight against chronic disease.

Policy has little direct relationship with birthrates (Brainerd 2014; Sobotka, Matysiak and Brzozowska 2019). Because low fertility has its origins in improved opportunities, especially among women, it is likely to persist indefinitely. Readiness for the coming demographic changes will require attention and planning—including realistic assessments of the likely speed of these changes and of the potential role of immigration in dampening this

new demographic transition. Now is the time for U.S. policymakers to seriously confront the implications of shifting population patterns and to plan responsibly.

Box 3-7. Consumption and Investment in an Aging Society

As the U.S. population skews older, aggregate consumption patterns change. Nonhousing expenditures—such as transportation, clothing, and food purchased away from home—largely follow a hump-shaped pattern over the life cycle; they are lowest during early entry into the labor force (under 25 years of age), highest during peak working age (from 45 to 54), and decline upon retirement (over 65) (Foster 2015). Health care consumption, including hospitalizations and prescription drug use, increases dramatically with age (Hales et al. 2019).

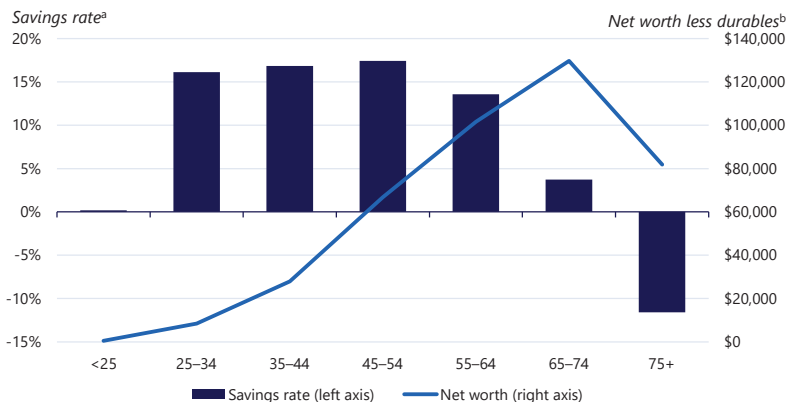
Aging has upstream effects on the labor market, as employment shifts across economic sectors to accommodate demand changes. The Bureau of Labor Statistics projects the health care and social assistance sector will add 2.1 million jobs over the next 10 years, growing faster than any other sector (BLS 2023c). Health care support occupations are projected to account for one out of every six new jobs during the coming decade.

The shifting age distribution also affects aggregate spending, borrowing, and saving. The canonical life-cycle hypothesis model predicts that people consider their expected income stream and desired consumption and make informed decisions to smooth lifetime consumption (Modigliani and Brumberg 1954). The smoothing choices are typically characterized by demand for borrowing at young ages and saving for retirement during middle age. These behaviors imply that as people age, their wealth tends to increase, even excluding the equity of durable goods like housing and vehicles. Wealth balances typically decline only at the highest ages, suggesting that the overall aging of the U.S. population has likely increased the aggregate supply of loanable funds.

The cross-sectional expenditure data shown in figure 3-iii confirm this expectation. In 2022, the rate of saving for consumers under 25 was essentially zero, on average, according to the Consumer Expenditure Survey. The rate was higher for middle-aged Americans, peaking at 17.4 percent for those age 45 to 54, and negative for older Americans, reaching –12 percent for people 75 and above. Research suggests that the movement of baby boomers into their prime saving years increased the aggregate saving rate by about 2 percentage points in the period 1980–90 (Dyner, Edelberg, and Palumbo 2009).

Because of its impact on rates of saving and aggregate loanable funds, demographic change can also influence real interest rates, putting downward pressure on the natural interest rate as aging cohorts save for

Figure 3-iii. Savings Rates and Wealth in 2022, by Age Group



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Sources: Bureau of Economic Analysis; CEA calculations.

^a The savings rate = 1 - Total Expenditures / After-Tax Income in the CEX.

^b Median net worth of families with heads in each age range, less housing equity and net vehicle equity (total vehicle value less total vehicle loan balances).

2024 Economic Report of the President

retirement. In a steady state, cohorts moving through their life cycles would have no time-varying impact. However, the baby boom generation is disproportionately large, and the United States is transitioning to increasingly low fertility rates and long lives after retirement, changes that will affect aggregate outcomes. Carvalho, Ferrero, and Nechio (2017) argue that life-expectancy increases leading to increased savings have, in particular, driven down real interest rates. Gagnon, Johannsen, and Lopez-Salido (2016) estimate that demographic factors are responsible for a 1.25-percentage-point decline in real interest rates in the United States since 1980. An inflection point exists where the savings rate declines and wealth begins shrinking, but as figure 3-iii shows, the declines tend to occur well past age 65. Although the last of the baby boomers will soon enter the negative-saving life-cycle period, the process that places upward pressure on interest rates will unfold gradually. Retirees consume only a fraction of their total savings each year, with the bulk carried forward and reinvested. This implies the current downward pressure on natural interest rates may therefore persist for an extended period.