

Working PAPER

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Trends in SSDI Benefit Receipt: More Recent Birth Cohorts are Entering Sooner and Receiving Benefits Longer

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ABSTRACT

We provide the first available statistics on the extent to which successive birth cohorts have entered Social Security Disability Insurance (SSDI), and on cross-cohort trends in the average number of years of SSDI benefit receipt among all individuals of a given birth cohort. Following cohorts born from 1955 to 1974, we find that the percentage of each birth cohort entering SSDI by a given age generally increased for both men and women, with some slowing of that growth in more recent years. Mean years of benefit receipt by a given age among all individuals in the birth cohort grew more rapidly, due to the combined effects of increased entry before that age and lower mortality after entry. For cohorts born in 1955 to 1964, mean years of benefit receipt by age 50 increased by 18 percent for men (0.54 to 0.64 years) and by 50 percent for women (0.38 to 0.57 years). These findings largely hold when we account for immigration, which is important because cross-cohorts trends in immigration may be masking important cross-cohort trends in SSDI entry.

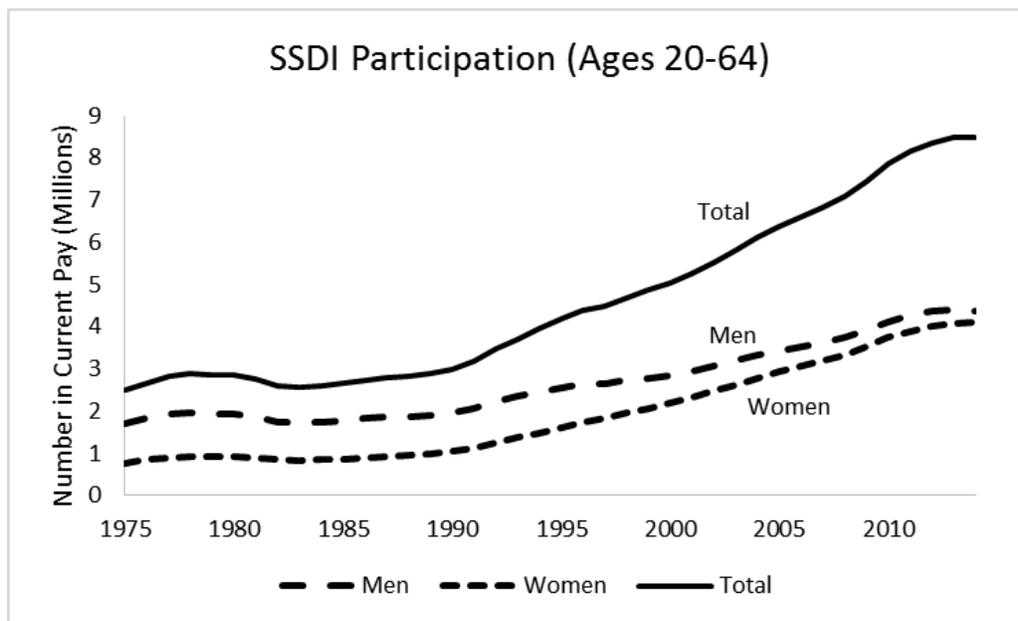
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I. INTRODUCTION

The number of disabled workers who receive Social Security Disability Insurance (SSDI) has almost tripled in the last three decades, from 2.9 million in 1980 to 8.5 million in 2014 (Figure 1). There is disagreement on the primary causes of this growth. Some experts, including SSA's chief actuary, argue, in the words of the latter, that the reasons have been "long anticipated and understood," and that this growth is almost entirely due to growth in the number of workers and the aging of the baby boom cohort (Pattison and Waldron 2013, Goss 2014). Others claim that changes in the SSDI program, including reduction in the stringency of medical eligibility criteria, are the greatest contributors to the growth in SSDI because they have led to increases in award rates for mental disorders and musculoskeletal conditions such as back pain (see, for example Autor and Duggan 2006, Burkhauser and Daly 2012). Liebman (2015) decomposes the contribution of various factors to SSDI growth and concludes that rising incidence rates (that is, the number of new SSDI awards per the number of disability-insured individuals) account for about 50% of the growth from 1985 through 2007. He also finds that rising incidence rates were predominantly a factor prior to 1993; population aging has been the predominant factor in the years since then.

Figure 1. Number of SSDI Beneficiaries in Current Pay Status, Total and by Gender, 1975–2014.



Source: Authors' analysis of SSA actuarial data for the years 1975–2014.

Notes: This figure shows time series for the number of SSDI beneficiaries in current pay status, total and by gender.

As the above description of research on SSDI growth may suggest, it is difficult to parse statistics on SSDI growth because annual statistics confound the effects of population aging with the effects of various other factors. This confounding is all the more problematic because the

effects of other factors on SSDI claiming, such as a recession, often affect awards and other program statistics for a long period after they occur, and may be dependent on the age distribution of the workforce when they occur. One way to avoid this confounding is to focus on statistics for individual birth cohorts as they age. For instance, the effect of a recession on a birth cohort's entry into SSDI over multiple years may be more apparent from comparing that cohort's experience to the experience of an earlier or later cohort that did not experience a recession at the same age. In contrast, comparing the SSDI entry of workers of all ages following the recession to the entry of workers of all ages at other times confounds the effects of changes in the age distribution of the labor force with the effects of the recession.

This paper takes a first step towards developing and analyzing such birth cohort statistics. Specifically, we provide the first publicly available statistics on the extent to which recent successive birth cohorts (those born from 1955 through 1994) entered SSDI during their working-age years, and on trends in the average number of years of benefit receipt among all individuals of a given birth cohort.¹ Because we focus on cross-cohort numbers instead of cross-sectional statistics, the statistics are not influenced by the general aging of the working-age population due to the relatively large baby boomer cohorts—those born from 1946 to 1964.

Generally, we find that the average number of years of SSDI benefit receipt (and, by extension, Medicare coverage), among all individuals of a given birth cohort, has increased with successive birth cohorts, with some slowing of that growth in more recent years. For the most part, the percentage of those who entered SSDI by a given age grew for those born in the two decades from 1955 through 1974. We observe growth for both men and women, and find much more rapid growth for women because of the increase in female labor force participation since the 1950s. We also find that mean years of SSDI benefit receipt (and again, Medicare, by extension) has grown even more rapidly due to the combined effects of entry at younger ages and lower mortality after entry. More specifically, the mean number of years of SSDI benefits received by cohort members as of any given age has increased at a faster rate across cohorts than SSDI entry as of the same age.

Our findings account for a factor that is often ignored in discussions about growth in the SSDI rolls: immigration. Some legal immigrants eventually become disability-insured—they accumulate a sufficient earnings history to qualify for SSDI—and, should they subsequently apply for benefits and are determined to meet medical eligibility criteria, they enter SSDI. Recent immigrants are less likely to enter SSDI than their native-born peers of the same age because they need time to become disability-insured due to having started to earn quarters of coverage at an older age.² Furthermore, immigrants may enter SSDI at rates different from their native-born counterparts even when they are disability-insured for reasons that have to do with how healthy they are when they arrive, the types of jobs they have, and their access to health and other social

¹ Manchester and Song (2011) documented an increase in the share of cohorts becoming entitled to SSDI by the time they reached their early 50s for birth cohorts born between 1944 and 1954.

² Section 211 of the Security Protection Act of 2004 (Public Law 108-203), signed into law March 2, 2004, imposes additional requirements for determining “fully and currently insured” status for noncitizen workers who were not assigned a Social Security number prior to January 1, 2004.

services.³ It is important to recognize the role of immigration in determining trends in SSDI entry because if immigrants indeed enter SSDI at a different rate than their age peers born in the U.S., trends in SSDI entry for birth cohorts might be confounded by trends in immigration, complicating our understanding of the reasons behind them.

The potentially confounding effects of immigration on SSDI statistics are not unique to statistics for birth cohorts; they also apply to annual SSDI program statistics. Our effort to construct birth cohort statistics made it apparent that immigration influences trends in all SSDI statistics in various, often subtle ways. To our knowledge, past research has not recognized this issue.

In the remainder of this paper, we describe the data and methods used, present the results, and discuss the implications of the findings on the outlook for future growth in SSDI and the status of the SSDI trust fund, which is currently expected to be depleted by 2032 (The Board of Trustees, Federal Old-Age and Survivors Insurance and Federal Disability Insurance Trust Funds 2018).

DATA AND METHODS

Data

Our primary data source is SSA actuarial data for the years 1975–2014, received directly from SSA’s Office of the Chief Actuary. These data include, for each five-year age group from 15 to 19 through 60 to 64, by year and sex: (1) counts for “population in the Social Security area,”⁴ people insured for disabled worker benefits (“disability-insured”), and disabled workers receiving monthly benefits in December of the calendar year (“in current pay”); (2) disabled-worker incidence rates (that is, awards to those who are insured but not yet receiving benefits); and (3) termination rates (that is, terminated beneficiaries divided by number of beneficiaries)⁵ due to death or recovery.

Figure 2 shows the growth from 1975 to 2014 in the Social Security area population and disability-insured population for ages 20–64, by sex. The percentage of the population that is disability-insured has been relatively stable for men but until quite recently has been increasing substantially for women due to long-term increases in female labor force participation. Figure 3 shows the percentage of the Social Security area population and disability-insured population that is receiving DI (i.e., in current pay status). Using either population measure, the percentage receiving DI increased steadily from the mid-1980s through 2012, and then leveled out through the end of the period. Underlying these trends is the fact that the 20-64 population has become

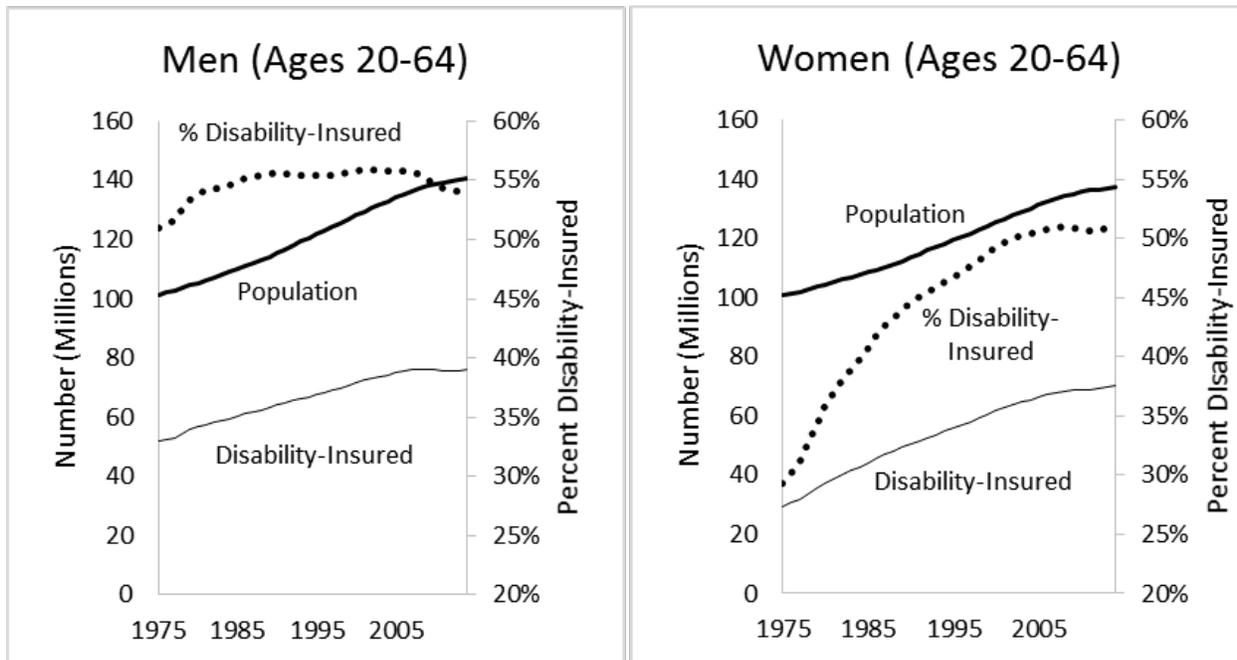
³ Engelman et al. (2017) found that immigrants are substantially less likely than native-born Americans to report work disability, to be insured for SSDI benefits, to apply for those benefits, and to be awarded benefits.

⁴ SSA (2015, p. 12) defines the population in the Social Security area to include: “residents of the 50 states and the District of Columbia adjusted for net census undercount; civilian residents of American Samoa, Guam, Northern Mariana Islands, Puerto Rico, and U.S. Virgin Islands; federal civilian employees and persons in the U.S. armed forces abroad and their dependents; noncitizens living abroad who are insured for Social Security benefits; and all other U.S. citizens abroad.”

⁵ The denominator for the termination rates captures “termination exposure” and equals the sum of the number of disabled worker beneficiaries at the beginning of the year plus half of the awards during the year.

older, on average, due to the aging of the baby boom cohort. The fact that the oldest members of the baby boom have now reached 65 means that the effect of population aging is tapering off. A primary motivation of our paper is to disentangle the effects of the aging population from other factors that affect DI growth.

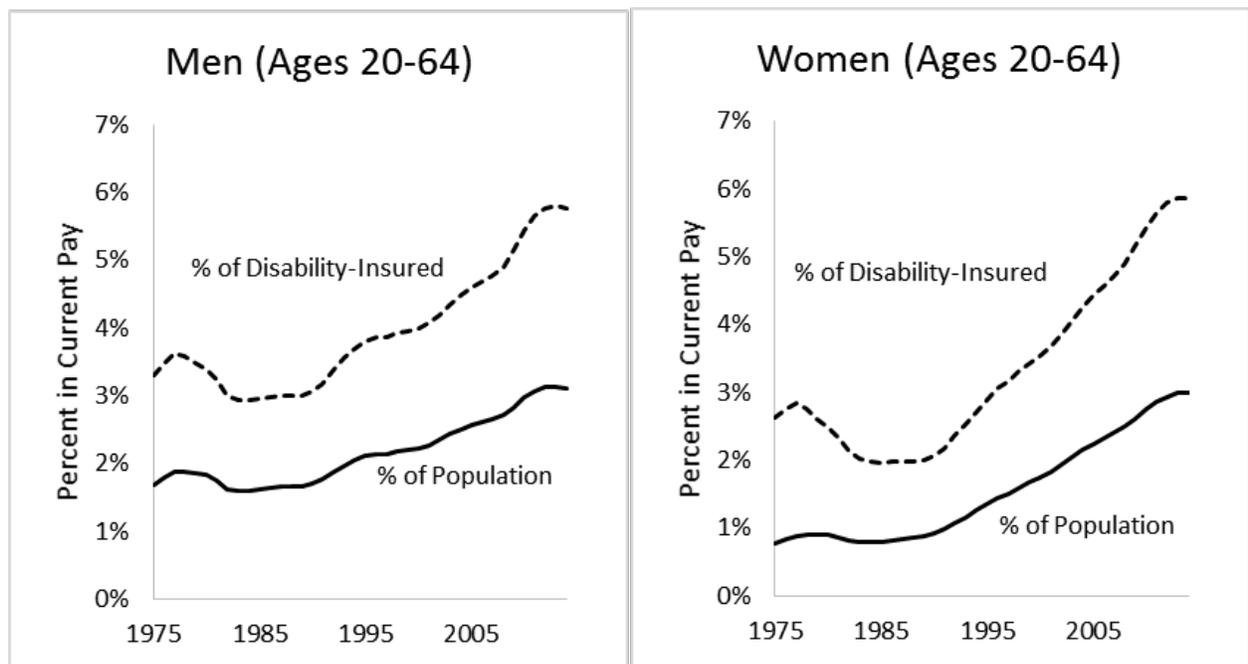
Figure 2. Social Security Area Population and Disability-Insured Population, Ages 20–64.



Source: Authors' analysis of SSA actuarial data for the years 1975–2014.

Notes: This figure shows time series for the size of the Social Security area population, disability-insured population, and percentage of the Social Security area population that is disability-insured, ages 20-64.

Figure 3. Percent of Social Security Area Population and Disability-Insured Population on DI, Ages 20–64.



Source: Authors' analysis of SSA actuarial data for the years 1975–2014.

Notes: This figure shows time series for the percent of the Social Security area population and disability-insured population that is in DI current pay status, ages 20–64.

We supplement the SSA actuarial data with Centers for Disease Control and Prevention (CDC) mortality data for the years 1975–2014 (CDC 2016). These data provide, for each year, the average number of deaths in each of the following age groups: 15–19, 20–24, 25–34, 35–44, 45–54, and 55–64. As we explain below, the CDC mortality data allow us to test the sensitivity of the results to whether we do or do not account for net migration into the U.S.⁶

Methods

We conducted all our analyses separately for men and women because of how differently SSDI participation evolved by sex over this period. The main reason for this difference is rapid growth in female labor participation—and therefore disability-insured rates (Goss 2014; Liebman 2015). In addition, certain policy changes that occurred may have affected men and women differently. For example, the 1996 welfare reform and contemporaneous expansion of the Earned Income Tax Credit likely affected disability-insured status, and therefore SSDI

⁶ The SSA actuarial data is available for five-year age groups; the CDC mortality data is available for a mix of five- and ten-year age groups. We converted the five- and ten-year age counts to single-year age counts by interpolation to allow the accumulation of birth-cohort statistics; see Technical Appendix. All appendices are available at the end of this article as it appears in JPAM online. Go to the publisher's website and use the search engine to locate the article at <http://www3.interscience.wiley.com/cgi-bin/jhome/34787>.

participation, by women—single mothers in particular—more than men (see, for example, Meyer and Rosenbaum 2001).

Trends in the Extent to Which Successive Birth Cohorts Enter SSDI

We first examine trends in the extent to which successive birth cohorts (born from 1955 through 1994) enter SSDI by age 40, 45, 50, and 55. We do this by calculating, for each birth cohort, the percentage of each cohort that had entered SSDI by each age from age 20 through the oldest age available for the cohort in the data. For the size of each birth cohort, we use the size of the age-20 population in the Social Security area in the year that members of the birth cohort attain age 20; thus, changes in the cohort's size due to mortality and immigration that occurred prior to age 20 do not directly affect comparisons of statistics across cohorts. The percentage having entered SSDI at each age is the ratio of (1) the number of individuals who entered SSDI by each age to (2) the number of individuals in that cohort at age 20.⁷

To show the effects of accounting for net migration after age 20, we add to the size of the cohort at age 20—the denominator in the ratio described above—the estimated number of people added to the Social Security area population through age X (where X is 40, 45, 50, or 55), minus those who left the population during that time, excluding deaths. We use the CDC mortality data to distinguish between the effects of net migration and the effects of mortality on the size of the population at risk for SSDI as each cohort ages.⁸

Finally, as a sensitivity check, we consider the extent to which observed trends in the above statistics are attributed to trends in labor force participation. For this analysis, we replace the denominator for the percentage entering by age X with the number of disability-insured workers by age X. Comparison of the trends in the resulting percentages to those in the immigration-adjusted population percentages show the extent to which trends in the latter are due to trends in labor force participation. Because the number of disability-insured individuals at age X includes those who entered the country (or Social Security area population) before age X and became disability-insured, we do not need to further adjust for net migration in this analysis.

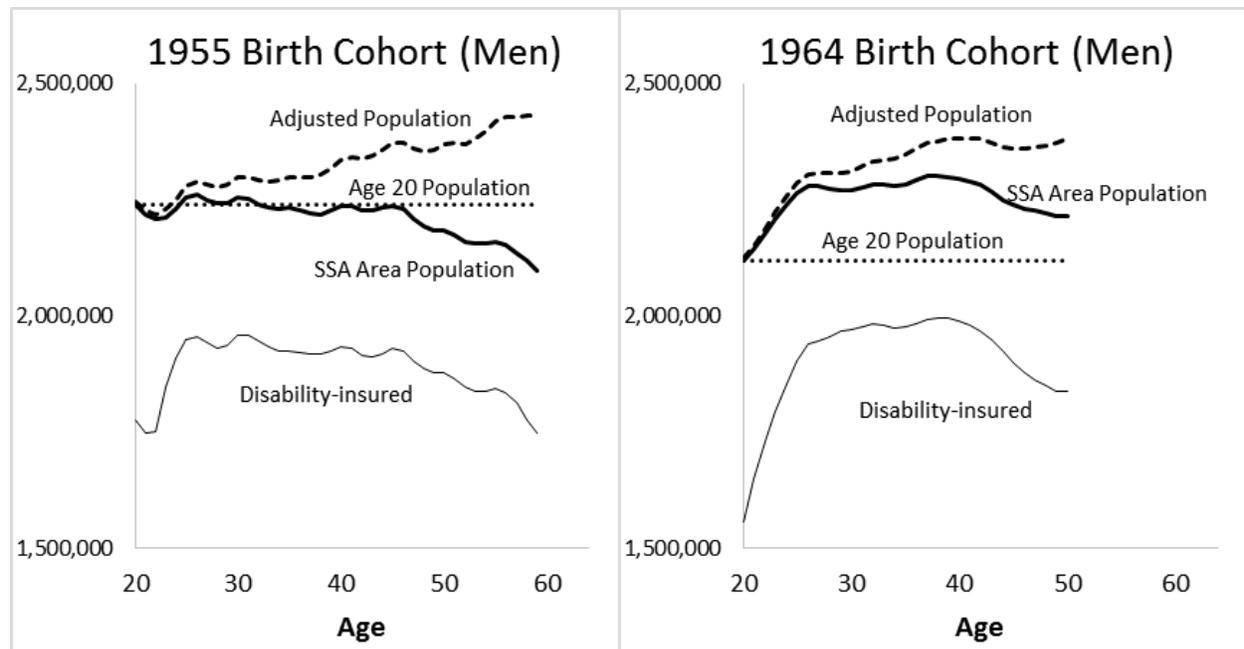
To help illustrate our method, the two panels in Figure 4 depict our three alternative denominators along with the SSA area population and cumulative number of deaths, for men in the cohorts born in 1955 (left panel) and 1964 (right panel). For the 1955 cohort, at age 50 in 2005, the SSA area population is smaller than the age 20 population because cumulative deaths in interim years exceeded cumulative net immigration. For the 1964 cohort, at age 50 in 2014,

⁷ The numerator for the percentage who entered SSDI is simply the accumulated numbers of awards between age 20 and a given age. It includes some minimal level of double-counting due to the small fraction of the cohort that enters SSDI, recovers and leaves the rolls, and subsequently re-enters SSDI. We have tested the sensitivity of our results to a plausible level of reentry among those who first enter and then leave the rolls, and obtained similar results.

⁸ The estimated number of people added to the Social Security area population from age 20 through age X net of those who left the population during that time is the difference between the cohort size at ages X and 20. That difference is increased by net immigration and reduced by mortality in the interim. We subtracted CDC mortality estimates from the difference to infer the size of net migration. In our statistics for any birth cohort, the denominator is the size of the cohort at age 20. The adjusted denominator at age X is the size of the cohort at age 20 plus interim net immigration into the Social Security area population of those born in the same year. The size of the latter relative to the former depends on whether net immigration in the interim exceeds mortality.

the size of the SSA area population is larger than the age 20 population because cumulative net immigration in the interim exceeded cumulative mortality. For both cohorts, the adjusted population is the size of the cohort at age 20 plus cumulative net migration. Finally, for both cohorts, the disability-insured population represents a fairly stable majority of the SSA area population, especially after age 25.

Figure 4. Size of SSA Area Population, Adjusted Population, and Disability-Insured Population, for Men in the 1955 and 1964 Birth Cohorts.

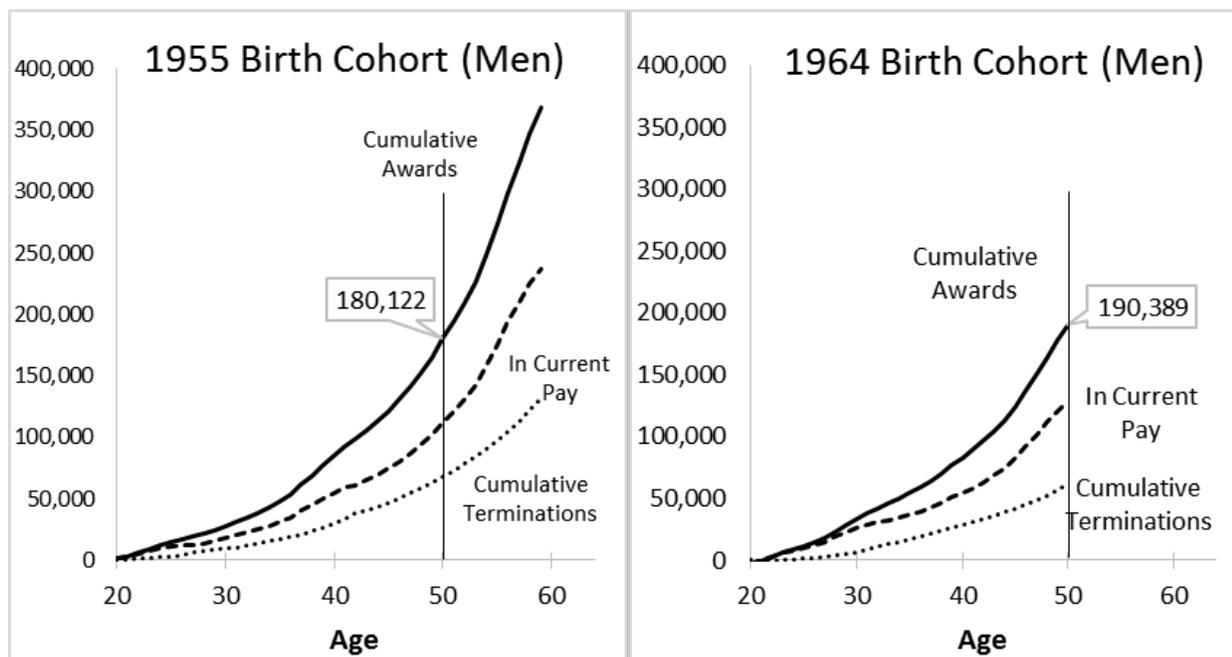


Source: Authors' analysis of SSA actuarial data and CDC mortality data for the years 1975–2014.

Notes: This figure shows the size of different population measures at each age from 20 to either 59 (1955 birth cohort, left panel) or 50 (1964 birth cohort, right panel). The adjusted population size adds cumulative deaths among birth-cohort members to the SSA area population, which also includes net immigration.

The two panels in Figure 5 depict our numerator—the cumulative number of awards by each age—along with the two series we used for its construction: the number in current pay status and cumulative terminations among DI beneficiaries, including both deaths and recoveries. For both the 1955 cohort (left panel) and 1964 cohort (right panel), it is evident that accounting for terminations is important to credible tracking of cumulative entry into DI. As a preview to the results below: for the 1955 cohort, at age 50, the numerator for our main series is 180,122 (cumulative awards) and the denominator is 2,241,546 (age 20 population), so the estimated percent who entered DI by age 50 is 8.04 percent; the respective numbers for the 1964 cohort at age 50 are 190,389, 2,120,859, and 8.98 percent. These calculations suggest a 12 percent increase in the proportion of men entering DI by age 50 for the 1964 cohort compared to the 1955 cohort.

Figure 5. Cumulative Awards and Terminations, and the Number Receiving DI payments, for Men in the 1955 and 1964 Birth Cohorts.



Source: Authors' analysis of SSA actuarial data and CDC mortality data for the years 1975–2014.

Notes: This figure shows cumulative awards and terminations, and the number receiving DI payments, at each age from 20 to either 59 (1955 birth cohort, left panel) or 50 (1964 birth cohort, right panel).

Trends in Mean Years of Benefit Receipt by a Given Age

To measure mean years of benefit receipt for a cohort by a given age (40, 45, 50, and 55), we first calculate, for each birth cohort, the cumulative number of cohort members in current pay status in each year from age 20 through age X (where X is 40, 45, 50, or 55).⁹ We then create two alternative series for the per-cohort-member number of years on SSDI. For the first series, we divide the cumulative number of members in current pay status by the number of individuals in that cohort at age 20. For the second series, we divide the cumulative number of members in current pay status by the size of the cohort at age X (accounting for net migration since age 20 minus all deaths of cohort members since age 20).

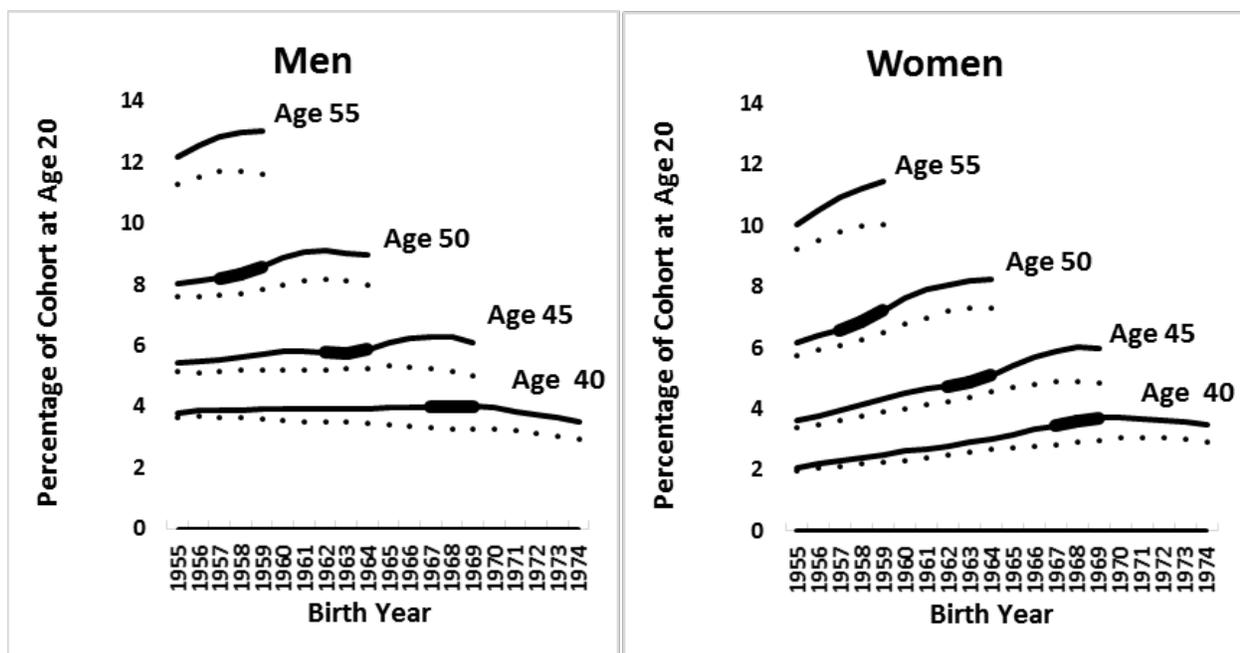
⁹ We adjust the cumulative number of cohort members in current pay status in each year from age 20 through age X to correct for the fact that some of those in current pay status in a given year enter or exit SSDI that same year and are therefore on the rolls for less than 12 months. The net number of SSDI entrants in a given year equals the 1-year change in the number of cohort members in current pay status. Our adjustment assumes that beneficiaries spend an average of 6 months on the rolls in their first and last years of benefit receipt. This procedure misses those who entered the rolls early in the year and died or recovered by the end of the year; if the share of high-mortality awardees has been declining, this would lead to an overestimate of the trend increase. We also assume that accumulated benefit receipt for 20 year olds on the rolls in December is 1 year.

RESULTS

Trends in the Extent to Which Successive Birth Cohorts Enter SSDI

Figure 6 shows time series for the estimated percentage of each birth cohort that entered SSDI by ages 40, 45, 50, and 55, separately for men (left panel) and women (right panel), both without and with the adjustment for immigration (solid and dashed lines, respectively). The longest time series is for the percentage who entered SSDI by age 40, which we are able to calculate for birth cohorts 1955 through 1974; the shortest time series is for the percentage who entered SSDI by age 55, which we are able to calculate for birth cohorts 1955 through 1959 only.¹⁰

Figure 6. Trends in SSDI Entry by Age 40, 45, 50, and 55, as Percentage of the Size of the Birth Cohort in the SSA Area Population at Age 20.



Source: Authors' analysis of SSA actuarial data and CDC mortality data for the years 1975–2014.

Notes: This figure shows time series for the estimated percentage of each birth cohort that enters SSDI by ages 40, 45, 50, and 55, without and with the adjustment for immigration (solid and dashed lines, respectively). The longest time series is for the percentage who enter SSDI by age 40, which we show for birth cohorts 1955 through 1974; the shortest time series is for the percentage who enter SSDI by age 55, which we show for birth cohorts 1955 through 1959. The thicker portions indicate the timing of the Great Recession for each series (calendar years 2007–2009).

For men, we find that the estimated percentage of each birth cohort that entered SSDI by ages 50 and 55 increased over the period—whether or not we adjust the denominator of the

¹⁰ The data allow us to construct both longer and shorter series than those depicted in Figure 6. For example, we could show a longer times series for SSDI entry by age 30 (for birth cohorts 1955 through 1984), and a shorter one for SSDI entry by age 57 (for birth cohorts 1955 through 1957). The time series in Figure 6 reflect the general trends we observe across all the time series we are able to construct using the data.

series for immigration. The series for entry by age 45 increased without, but not with, the adjustment for immigration, and the series for entry by age 40 slightly decreased without adjustment, and shows a more substantial decline with the adjustment.

The growth in the percentage of men who entered SSDI by age 50 is due to growth in the percentage who entered after age 40. To see this, consider birth cohorts 1955 through 1964, which turned age 40 between 1995 and 2004, and age 50 between 2005 and 2014. There is a 0.1 percentage point increase in the unadjusted percentage who entered SSDI by age 40 across these 10 cohorts, and a 0.2 percentage point decrease in the adjusted series. In contrast, the unadjusted percentage at age 50 increased by 0.9 percentage points and the adjusted percentage increased by 0.4 percentage points. After netting out the change in the corresponding series at age 40, the changes as of age 50 represent increases of 0.8 and 0.6 percentage points, respectively, over a decade.

It is clear that the recession contributed to the positive trends across cohorts at ages 45 and 50 for a few years after the start of the recession, but that the positive trends preceded the recession. As the thicker portions of each unadjusted line for ages 45 and 50 show, growth for cohorts entering the age group during and shortly after the recession is higher than at other times. It is evident from the trends before the recession, however, that much of the growth at these two ages is due to factors other than the recession. At both ages, growth was increasing before the recession. We are also able to follow outcomes for both ages for quite a few years after the recession, and it appears that the percentage entering SSDI by each age started to decline in the last few years. For entry by age 45, the unadjusted series remained well above the pre-recession percentage but the adjusted series did not; for entry by age 50, both the unadjusted and adjusted series remained above the pre-recession percentage.

For women, the growth in the percentage of each birth cohort that entered SSDI by each age was larger than for men, and noticeable already by age 40 in both the adjusted and unadjusted series. For the same 10 cohorts (those that turned 40 between 1995 and 2004, and 50 between 2005 and 2014), the unadjusted percentage of women who entered by age 40 rose by 1.0 percentage point, and the adjusted percentage by 0.7 percentage points. Growth continued between ages 40 and 50: at age 50, the unadjusted percentage for women in these cohorts rose by 2.1 percentage points, and their adjusted percentage rose by 1.5 percentage points. The increases in these percentages for women from age 40 to age 50 after netting out the corresponding increases at age 40 are comparable to those for men: 1.1 percentage point for the unadjusted series and 0.8 percentage points for the adjusted series.

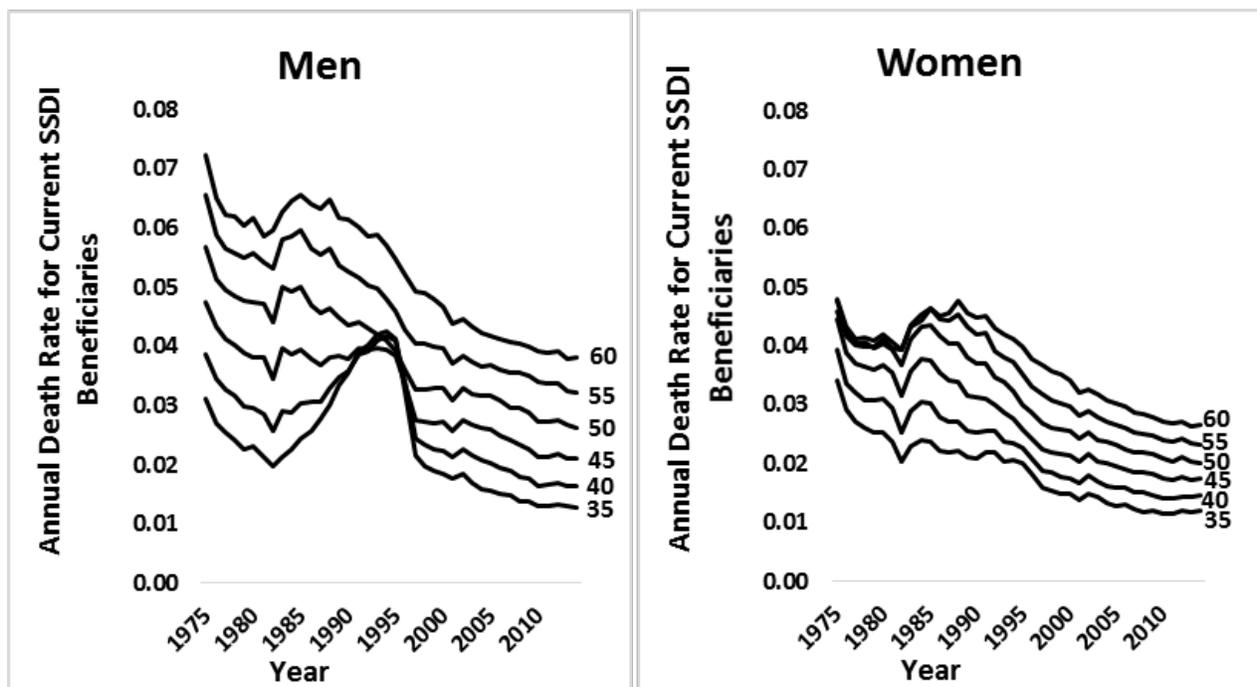
Neither of the series shown in Figure 6 is ideal because both series include SSDI entrants who immigrated into the SSA area population after age 20 in the numerator; the data do not support construction of separate series for the percentage of SSDI entrants among those already in the SSA area population at age 20 and those entering later. Call the first series reported P , the second series reported P_a , and the unobservable series for those in the SSA area population at age

20 P_n . Our strong expectation is that, for every age above 20, P_n will be between P and P_a for every cohort.¹¹

Trends in Mean Years of Benefit Receipt by a Given Age

Growth in the percentage of cohort members who entered by any given age will increase the mean number of years of benefit receipt by the same age, among all birth-cohort members, if other things remain constant. Two other important factors may also affect trends in mean years of benefit receipt by a given age: trends in death rates among entrants and trends in recovery rates. According to SSA actuarial data, apart from spikes in the late 1980s and in 1997, annual recovery rates among beneficiaries have not declined in recent decades (not shown). However, annual age-specific beneficiary death rates have fallen considerably since 1975 (Figure 7).

Figure 7. Annual Age-Specific Death Rates for Current SSDI Beneficiaries, 1975–2014.



Source: Authors' analysis of SSA actuarial data for the years 1975–2014.

Notes: This figure shows time series for the annual death rates for current SSDI beneficiaries at ages 45, 50, 55, and 60.

¹¹ Underlying the expectation is the fact that, for each age above 20 and each sex, there is substantial positive growth in the percentage of the SSA area population that was not in the SSA area population at age 20; this growth is evident in Figure 1 and is the reason that the adjusted series has a less positive slope than the corresponding unadjusted series. At any age, X , P_n must lie below P because it has the same denominator and includes in the numerator SSDI entrants who entered the SSA area population between age 20 and X . P_n will lie above P_a if, as we expect, DI entry rates at X are lower for those who entered the SSA area population between age 20 and age X than for those in the population at age 20.

The trends in annual beneficiary death rates exhibit structural shifts in 1982 and perhaps also 1996. Although the general, consistent decline in death rates likely reflects improvements in medical care and perhaps other factors that affect longevity of all beneficiaries, it is likely that the structural shifts we observe are due to changes in the composition of SSDI beneficiaries. For example, the annual death rate for male beneficiaries age 50 in 1983 was 11% higher than the death rate in 1982; this jump followed a steady decline from 1975 to 1982. Most of the jumps in age-specific death rates after 1982 are likely due to reforms in the early 1980s that tightened eligibility and increased the number of continuing disability reviews (CDRs), resulting in current beneficiaries having more severe disabilities, on average, than in prior years (Liebman 2015).¹² The decline in mortality after 1996, especially for men, might be because many SSDI beneficiaries lost eligibility for benefits after Congress ended eligibility for those whose alcohol or drug addiction is material to their qualifying impairment (Moore 2015); mortality would fall because of this policy change if those who lost eligibility due to alcohol and drug addictions, who were disproportionately male, had relatively high mortality risk.

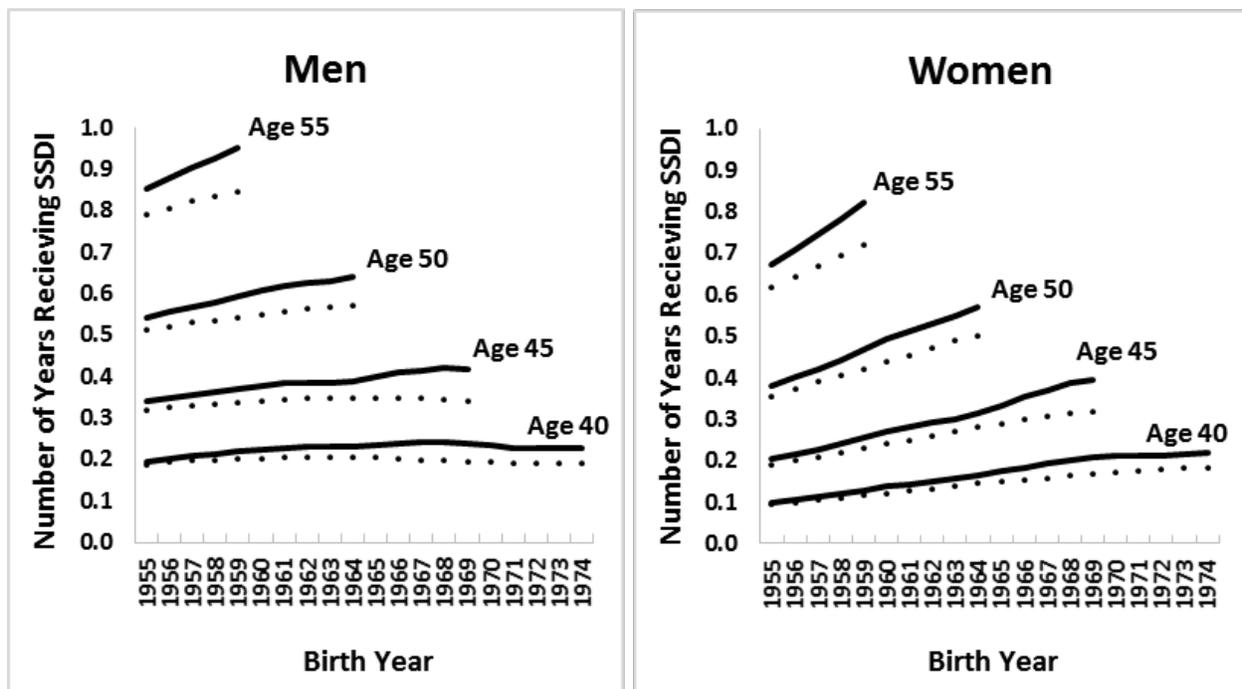
Because of the mortality decline, the cohort statistics for mean years of SSDI benefit receipt by a given age (Figure 8) have positive trends that are steeper than the trends in SSDI entry seen above (Figure 6). Notably, these trends continued through 2014. Consider, for instance, the unadjusted series for mean years of benefit receipt by age 50 for the 10 cohorts of men that turned 50 in 2005 through 2014 (that is, birth cohorts 1955 through 1964). The series increases from 0.54 years for the 1955 cohort to 0.64 years for the 1964 cohort, an 18% increase. The corresponding percentage increase for the adjusted series is 11%. In comparison, the unadjusted and adjusted percentage increases in the percentages of men in these cohorts who had entered SSDI by the same age were 12% and 5%, respectively. For women age 50 in the same cohorts, the unadjusted series for mean years of benefit receipt increases from 0.38 for the 1955 cohort to 0.57 for the 1964 cohort, a 50% increase; the adjusted percentage for this group increased by 41%. These increases compare to unadjusted and adjusted increases of 34% and 26% for SSDI entry by age 50.

DISCUSSION

We found that successive birth cohorts have increasingly entered SSDI at younger ages, with some slowing of that growth in more recent years. This trend is especially noticeable among women, where it is observed for ages younger than 40. For both sexes, there were substantial increases in entry from age 40 through age 50. Growth was larger for women than for men, apparently due to growth in women's labor force participation. These trends largely hold when we adjust the series for trends in net migration. Although some of the growth can be explained by the great recession, the positive trends start before the recession, and post-recession SSDI entry statistics by age 50 remain well above pre-recession levels.

¹² The stronger spike in mortality rates for men ages 35 and 40 from 1982 through the mid-1990s is likely due to deaths from HIV/AIDS; nationally, those deaths peaked in 1995 (CDC 2011).

Figure 8. Trends in Mean Years of SSDI Receipt Among all Individuals in the Birth Cohort in the SSA Area Population at Age 20, by Age 40, 45, 50, and 55.



Source: Authors' analysis of SSA actuarial data and CDC mortality data for the years 1975–2014.

Notes: This figure shows time series for the estimated per-cohort-member number of years on SSDI by ages 40, 45, 50, and 55, without and with the adjustment for immigration (solid and dashed lines, respectively). The longest time series is for the number of years on SSDI by age 40, which we show for birth cohorts 1955 through 1974; the shortest time series is for the number of years on SSDI by age 55, which we show for birth cohorts 1955 through 1959.

We also found that the increases in SSDI entry by a given age, combined with declines in death rates among SSDI beneficiaries, have resulted in marked growth in mean years of benefit receipt by a given age among all individuals in the birth cohort. Part of this trend can be attributed to improvements in medical care and perhaps other supports, but the changes in the composition of SSDI beneficiaries due to specific reforms and other factors appear to have played an important role too.

While much of the growth in SSDI can be explained by changes in the demographics of the labor force over the examined period, our findings show that some growth has occurred because members of more recent birth cohorts have on average entered SSDI sooner and stayed on the rolls longer. This trend has imposed substantial pressure on the SSDI trust fund and added to the considerable pressure on the financial status of the Medicare trust fund. Although annual SSDI entry has decreased considerably since 2010, our finding that mean years of benefits per cohort member have been steadily increasing reinforce the urgency of testing and adopting policies that will reduce avoidable labor force exit and SSDI entry by workers who experience work-threatening medical problems.

It is interesting that SSDI entry by successive cohorts has increased at a time when mortality among beneficiaries has declined. For successive cohorts, the advances in medicine and possibly

other factors that are leading to declines in mortality of SSDI beneficiaries have not led to a decline in SSDI entry. The fact that the series were moving in opposite directions suggests that the primary causes of growth in SSDI entry are factors that increase entry among those less likely to experience mortality after entry. Such factors could include, for instance, both reductions in the stringency of eligibility criteria and labor market factors that have led more workers with significant, but low-mortality medical conditions to seek entry into SSDI. Indeed, from 1981 to 2015, the rate of SSDI entry based on musculoskeletal conditions, which typically have low mortality, increased substantially among disability-insured workers—from 0.03 to 0.05 percent among those under age 50 and from 0.17 to 0.41 percent among those over 50; over the same period, the rate of SSDI entry based on mental disorders, which also have low mortality, rose from 0.03 to 0.07 percent among those under age 50 and from 0.05 to 0.08 percent among those over 50.¹³

Increases in SSDI entry and benefit receipt by successive cohorts appear to add to other indicators of the decline in the wellbeing of a segment of the prime-age population. Case and Deaton (2015) report a substantial increase in all-cause mortality among white, non-Hispanic Americans ages 45–54 from 1999 to 2013. They attribute the rise in mortality since 1999 primarily to increases in death due to poisoning (drugs and alcohol), and suicides, among both men and women. They also find that increases in mortality were accompanied by increases in self-reported midlife morbidity, as indicated by “measures of self-assessed health status, pain, psychological distress, difficulties with activities of daily-living (ADLs), and alcohol use.” In particular, the proportion of middle-aged, white, non-Hispanics reporting being unable to work doubled from 1997–1999 to 2011–2013. Krueger (2016) has documented secular trends in labor force participation that appear to mirror our findings—declines for prime age men and, more recently, an end in growth in the labor force participation of women. Krueger also finds that about half of prime age men not in the labor force have a health condition that limits their ability to work, that a very large share take pain medication on a daily basis, and that they report low levels of emotional well-being.

Our analysis of entry into SSDI and SSDI benefit receipt by successive birth cohorts suggests that the cohort approach could also be helpful in disentangling changes in the age composition of the population from other factors that might affect outcomes of interest. There are numerous examples of such confounding in the social science literature. We are already proceeding to use this approach to better understand the size and dynamics of the impact of the Great Recession on SSDI benefit awards and labor force participation over the following 10 years. The same approach could also be used to better understand the recession’s impacts on mortality and receipt of Social Security retirement benefits. Historically, the cohort approach might be very helpful in better understanding the effects of the 1990s welfare reforms on welfare entry, births, SSI, SSDI, labor force participation and multiple other outcomes of potential interest. More generally, the birth cohort approach might also be very helpful in better understanding of the long-term effects of factors that influence risky behavior (e.g., opioid prescribing practices; efforts to reduce use of tobacco; and changes in nutritional and exercise habits) on mortality, disability and labor force participation. An important reason that the effects of such factors on long-term outcomes are difficult to quantify is that the population has aged so

¹³ Author calculations based on SSA (2017, Tables 41 and 42) and SSA Office of the Chief Actuary (2018).

much from when the factor changed until the outcome is observed. The birth cohort approach is a natural way to control for usual effects of aging.

In summary, growth in SSDI participation across cohorts adds to the emerging picture of growing economic distress for a significant number of prime-age workers. One of the ironies of these trends is that they reduce the number of disability-insured workers, which might have a lagged effect of reducing SSDI entry. For this and other reasons, more research will be needed to establish the connection between SSDI participation trends across cohorts and trends in mortality and labor force trends.

APPENDIX A. TECHNICAL APPENDIX

I. SSA ACTUARY DATA

The SSA actuarial data are generally available, by year, for 10 five-year age groups: 15–19, 20–24, 25–29, 30–34, 35–39, 40–44, 45–49, 50–54, 55–59, and 60–64. For each year in 1975–2014, we calculated counts for 1-year age groups of: the population in the Social Security area, the disability-insured, and individuals in current pay status. We performed these calculations as follows:

1. Calculated cumulative counts by ages 19, 24, 29, 34, 39, 44, 49, 54, 59, and 64.
2. Regressed a 5-order polynomial of above cumulative counts on the age cutoff points above.
3. Used the regression results to predict single-age cumulative counts for ages 19–64.
4. Calculated single-age counts as the difference between consecutive cumulative counts; for example, the number of disability-insured who are age 39 in 2005 is the difference between two cumulative counts of disability-insured in 2005: those who are ages 15–38 and those who are ages 15–39).

For each year, we also calculated rates for 1-year age groups of: SSDI incidence, beneficiary mortality, and beneficiary recovery. We performed these calculations as follows:

1. Regressed a 5-order polynomial of five-year age group rates on the mid points for those age groups (22.5, 27.5, 32.5, 37.5, 42.5, 47.5, 52.5, 57.5, and 62.5).
2. Used the regression results to predict single-age cumulative rates for ages 19–64.

II. CDC MORTALITY DATA

The CDC mortality rates are available, by year, for these age groups: 15–19, 20–24, 25–34, 35–44, 45–54, and 55–64. For each year in 1975–2014, we calculated the number of deaths for 1-year age groups as follows:

1. Calculated cumulative deaths by ages 19, 24, 34, 44, 54, and 64.
2. Regressed a 5-order polynomial of above cumulative counts on the age cutoff points above.
3. Used the regression results to predict single-age cumulative counts for ages 19–64.
4. Calculated single-age number of deaths as the difference between consecutive cumulative numbers.

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