CENTER for RETIREMENT RESEARCH at BOSTON COLLEGE

THE ALIGNMENT BETWEEN SELF-REPORTED AND ADMINISTRATIVE MEASURES OF APPLICATION TO AND RECEIPT OF FEDERAL DISABILITY BENEFITS IN THE *HEALTH AND RETIREMENT STUDY*

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Abstract

This paper examines the alignment between self-reported and administrative records of applications to and receipt of federal disability benefits. It uses data from the *Health and Retirement Study* (HRS), specifically the cross-wave consistent version developed by the RAND Corporation. The HRS has surveyed adults over the age of 50 every other year since 1992 to be nationally representative of the non-institutionalized older adult population, replenishing the sample with a new cohort every six years. The HRS asks respondents periodically if they are willing to have their survey information linked to earnings and benefits information maintained by the U.S. Social Security Administration (SSA). Most respondents agree to the linkage, which provides another source of information about application and receipt patterns for Social Security Disability Insurance (SSDI) and Supplemental Security Income (SSI) than the data that is collected from respondents in the survey. This information may be valuable in understanding disability program participation among older workers and the extent to which survey respondents accurately report their benefit receipt.

Using information in the HRS linked to SSA's *Form 831* records about disability benefit applications and its *Disability Analysis File* about benefit receipt, the paper compares survey and administrative reports of having ever applied to SSDI and SSI as well as the receipt of those benefits in each HRS survey wave from 1996 through 2016. It presents statistics on the characteristics of HRS respondents based on whether they consented to have their records linked to administrative files as well as whether those who consented to the linkage accurately reported their benefits status. The analyses make comparisons by calendar year and HRS sampling cohort, as well as by each age from 51 through full retirement age. An appendix to the paper offers a primer for other researchers considering using the HRS-SSA linked data.

The paper found that:

- Older cohorts in the HRS are more likely than younger ones to have consented to having their HRS data linked to SSA administrative records. Younger cohorts, however, are more likely to have consented in recent years, which is necessary to have been included in HRS's prospective permission scheme and to have consented to certain file linkages that may be useful to researchers, including the ones we used in our analysis.

- Aggregate self-reported percentages of application and receipt of SSDI and SSI are lower than those reported in HRS-SSA administrative data at nearly all ages, but rates of new applications and receipt of benefits (i.e., incidence) are similar between the ages of entering the HRS survey (51-56) through SSA's full retirement age.
- There are differences in SSDI and SSI application and receipt shares between HRS self-reports and administrative data across birth cohorts in the survey, but no systematic pattern in the difference between the two sources of information across all of the survey cohorts.
- Individual misreporting represents a minority of total cases but is more common relative to the share of older adults with interactions with the SSDI and SSI programs. Misreports range from approximately 4 percent to 12 percent of total respondents, depending on the program and age of respondents. False negatives (the respondent reports no application or receipt while the SSA data indicates application or receipt) tend to be more common than false positives, especially at older ages.
- The demographic, socioeconomic, and health characteristics of respondents who incorrectly report their benefits receipt (relative to SSA information) are different from respondents whose self-reports align with administrative records. Those differences vary by receipt of SSDI or SSI, but include respondent age, race, income, assets, education, health conditions, and health behaviors.

The policy implications of the findings are:

- Researchers who use HRS self-report data alone should be aware of differences in the prevalence rates relative to SSA-published statistics and administrative records for the same respondents. Using HRS self-reported data is likely to result in an underestimation of program application and receipt relative to HRS-SSA data. Moreover, characteristics of those who misreport differ from the full sample, meaning that descriptions of applicants' or recipients' demographics, employment, income, and health may differ depending on what sample is being used. As such, care should be taken in interpretations of applicant or beneficiary characteristics when using self-reports.
- Use of the SSA data linkage may not be feasible for all research purposes, particularly those where a loss in sample size due to consenting to the linkage would be problematic.

In cases where a linkage may not be practical, use of self-responses can still be informative in many research applications. These can include, but are not limited to, longitudinal analyses of employment or health characteristics in relation to SSA programs or the use of receipt or beneficiary status as covariates or controls in analysis.

Introduction

Understanding the circumstances that lead to federal disability benefit application and the post-application outcomes of both beneficiaries and denied applicants is critically important for considering changes to the determination process, program rules, or benefit generosity. The Social Security Administration (SSA) only collects information necessary to make benefit determinations and administer monthly benefits. As such, SSA collects some information from applicants about their work history, education, health status, income, and assets, but does not always know with whom applicants live, their other income sources, and whether they receive other forms of public or private assistance (SSA 2021). Once receiving benefits, SSA may periodically collect information on an individual's health status for the purposes of continuing disability reviews and will know if participants' earnings exceed substantial gainful activity, but the information available to the agency is limited.

For these reasons, researchers and policymakers turn to other sources information collected from disability program applicants and beneficiaries to have a more comprehensive understanding of their needs. Many nationally representative surveys collect detailed information from their respondents, including whether they believe they have a disability, have applied for Social Security Disability Insurance (SSDI) or Supplemental Security Income (SSI), or receive benefits from either program. Many of these sources solely collect self-reported information from their respondents, but some surveys link information collected from survey respondents to the SSA's administrative data to augment self-reported benefits status with the best information available to the agency. Recent research has capitalized on that linkage to better understand the accuracy of self-reported survey data, which is critical both in deciding how much trust to place in self-reports, but also in considering how to combine information from two potentially differing sources. As we discuss in what follows, the findings vary by the source of public benefits as well as the survey collecting the data (see for example, Meyer and Mittag 2019; Chen, Munnell, and Sanzenbacher 2018; Bee and Mitchell 2017).

In this manuscript, we compare reports of SSDI and SSI application and receipt using survey data from the *Health and Retirement Study* (HRS) to similar information contained in SSA administrative records. The HRS is a nationally representative, longitudinal survey of noninstitutionalized adults in the United States from age 51 onward that started in 1992; each respondent is interviewed every other year until they die or otherwise exit the study. As

respondents age, the HRS replenishes the survey every six years (in 1998, 2004, 2010, etc.). During each survey wave, respondents report their own benefits history, but have been periodically asked to have their information linked to earnings and benefits information stored by SSA, which administers the federal disability programs. Not all survey respondents consent to the linkage, but for those who do, it is possible to compare information reported by respondents to their administrative record to better understand the validity of self-reported benefits status and the potential utility of the administrative linkage for research purposes.

There are several reasons why making such a comparison with the HRS is important, even with the extant literature from other survey data sources. First, health shocks occur more frequently with age (Smith 2003), so HRS respondents will have heightened need for federal disability benefits relative to younger adults in other national surveys. Second, the years just before retirement offer what might be a potentially confusing mix of benefits: SSDI is available through full retirement age, Old Age and Survivors Insurance (OASI) benefits become available at age 62, and SSI benefits span both ages with eligibility requirements that change at age 65. Thus, misreporting may be more common, particularly given that all three programs are administered by SSA. Finally, the HRS has been collected since the early 1990s, and since that time, survey nonresponse has increased (Singer 2006), which could also signal changes in the quality of information obtained from those who do participate. Understanding how responses to questions on disability benefits and consenting to the administrative linkage over subsequent cohorts in the HRS may help researchers select samples and frame questions for future research studies.

Our descriptive analysis is meant to provide information to HRS users about the accuracy of self-reported disability benefits collected in the survey and the potential strengths and limitations of using the matched administrative data. We answer the following questions:

- What share of HRS respondents consented to having their data linked to allow for the measurement of SSDI and SSI application and receipt? How did the likelihood of consenting vary by cohort and over time?

- How do HRS respondents who consented to the SSA administrative linkage differ from those who did not, in terms of characteristics and the reporting of SSDI and SSI application and receipt?

- How do prevalence rates of having applied for or received SSDI or SSDI vary by cohort, time, and age? How different are the aggregate rates if a researcher were to use the self-reported data instead of the administrative records, and what factors might explain the difference?

- Among respondents who consented to the linkage, how accurate are self-reports, and what do we know about respondents whose reports are incorrect?

We find that a majority of HRS respondents have consented to having their data linked to SSA records, but rates of consent differ by survey cohort and over time. Consistent with earlier studies, we find demographic, employment, and health-related characteristics differ between respondents who do and do not consent to the linkage. We also find that generally, the share of respondents who report having applied to or receiving SSDI or SSI is lower than SSA records indicate. The pattern of underreporting is generally consistent across respondent age (regardless of what cohort or survey year they are asked); however, there is not a consistent pattern across survey cohorts. As with consenting to a linkage, we find differences in demographic, socioeconomic and health characteristics for respondents whose self-reports are discordant from their administrative records as compared to those who do not misreport.

In addition to documenting the alignment between self-reports and administrative records, this manuscript contains a primer for other researchers interested in using the HRS linked administrative records (Appendix A). While the SSA linkage has been available for more than two decades, using it requires detailed knowledge of the administrative files and the HRS process for collecting consent from survey respondents to link their data. With these high barriers to entry, the SSA linkage has potentially been underutilized. Our hope is that the manuscript combined with the primer will facilitate use by a broader array of researchers, particularly for research projects where the richness of the administrative data opens up new research possibilities to understand longitudinal outcomes of disability applicants and beneficiaries.

Background: The Accuracy of Self-Reported Public Benefits in National Surveys

Surveys offer a depth of information not available in administrative sources alone. This is especially true for longitudinal surveys, which can provide a detailed look at the characteristics, outcomes, and trajectories of individuals before, during, and after they apply for or receive SSDI or SSI. Davies and Fisher (2009) document some of the potential uses of linked survey and SSA administrative data, while also offering a succinct assessment of earlier work by researchers including Hyunh et al. (2002) and Koenig (2003) to document the reporting of SSDI and SSI in survey versus administrative sources. They summarize the literature based on analysis of data from older adults in the 1990s as showing that respondents to the Current Population Study (CPS) slightly underreported OASDI and significantly underreported SSI benefits, while the Survey of Income and Program Participation (SIPP) slightly overreported OASDI income and was mixed on SSI. Schimmel Hyde et al. (2018) used 2008-2009 data from the same sources and a working-age population and found that relative to the administrative record, many beneficiaries misreported their benefits status and income from benefits, and that discrepancies appeared to be larger than in earlier years of the surveys.

Recent research has sought to augment self-reports in surveys to understand the income from public benefits more broadly. Beginning with Meyer et al. (2015), together they suggest that misreporting is not uncommon and errs toward underreporting rather than overreporting. Meyer and Mittag (2019) found that income from public programs among working-age respondents in the CPS were dramatically understated in the CPS. Bee and Mitchell (2017) similarly documented underreporting of income among older adults in the CPS, driven primarily by misreported defined benefit pensions and retirement account withdrawals. Chen et al. (2018) extended the Bee and Mitchell work to other data sources and found that the CPS was an outlier in terms of retirement income misreporting. Compared to capturing 61 percent of retirement income in the CPS, the SIPP, for example, captured 93 percent of retirement income relative to administrative data, while the HRS captured 96 percent.

Despite the linkage to SSA administrative data for two decades, to our knowledge, there has not been work to date to understand the accuracy of reports from HRS respondents about applications to and receipt of SSDI and SSI. Our paper compared self-reports to administrative records. While it is simplest to assume that deviations between the two sources reflect respondent misreporting, it is important to note that there are reasons that individual reports may

offer more current or complete information than the administrative records. We will discuss reasons for deviations in what follows, in part to couch our findings, but also so that other researchers can use assess the strengths and limitations of self-reports relative to administrative data based on the research question at hand.

Data and Measures

In this section, we describe the data sources in more detail, the sample cohorts that we include in our analysis, and the measures we use to document SSDI and SSI application and receipt. We also discuss the process to collect consent for the administrative linkage from HRS respondents, implications for sample size, and our approach for adjusting the sample weights to account for non-consenters.

Data Sources

We combine information from publicly available survey data from the HRS with restricted-access SSA administrative records. The latter are available with permission from the HRS following an in-depth application and review process. We focus on a high-level discussion of the four sources of data we use in our analysis here; more detailed information about the files and the construction of our measures is contained in Appendix A.

The RAND-HRS is a cross-wave consistent file of the HRS, developed to facilitate research. The HRS is a longitudinal survey that is nationally-representative of the noninstitutionalized population in the United States over the age of 50. It has been fielded biennially since its introduction in 1992. The survey is known for its richness of data on health, income, retirement, and other topics important to older adults. The RAND-HRS simplifies information collected about SSI and SSDI benefits over many years of the study and using different survey instrument design, but is solely based on respondent self-reports in the HRS. For our analysis, we use the version of the file that contained data through 2018.

Form 831 Respondent Records is an SSA administrative file that contains information on initial applications for SSDI and SSI. The file we use contained data from 1988 (when SSA began storing the information) through 2016. *Form 831* records are limited to initial applications that received a medical review and do not include initial applications that were denied because they did not meet the financial criteria of federal disability programs, nor appealed applications.

The *Disability Analysis File (DAF)* is an SSA file that combines data from multiple administrative sources to produce monthly information about the receipt of SSDI and SSI benefits starting in 1996. The version of the file we use contained data through 2018.

The *HRS-SSA Permissions Consent History* is a file available from HRS that provides information about whether a respondent to the HRS consented to having their information linked to SSA records and whether a match with the data was found. We use this file to determine which respondents might have information available on disability program participation in the administrative records.

Sample Selection

To align with the availability of administrative records, we use data from 1996 through 2016, spanning four cohorts of the HRS. The cohorts include the HRS cohort (first interviewed in 1992; birth years 1931-1941), War Baby Cohort (first interviewed in 1998; birth years 1942-1947), Early Baby Boomers (first interviewed in 2004; born 1948-1953), and Middle Baby Boomers (first interviewed in 2010; born 1954-1959).[1] We include age-eligible sample members in each cohort, meaning that younger spouses who were interviewed with an older age-eligible respondent are included in our analysis once they themselves age into the survey. Except for the initial HRS cohort, these cohorts were first interviewed when they were ages 51-56. The HRS cohort included more birth years than the others; for parallel construction with the other later cohorts, we include only the "young HRS" born in 1936-1941 and first interviewed at ages 51-56 in 1992. We refer to this as the HRS cohort in what follows for simplicity; it is important to note that we found that the younger and older birth years of the HRS cohort differed in the outcomes considered in this manuscript.

For three of the cohorts, we use the data collected every other year from the initial interview through 2016 (Table 1). The exception is the HRS cohort, which initially was surveyed in 1992, but we do not include in our analysis until 1996, to align with the availability of data on disability receipt from the DAF. Once the individual reaches SSA's full retirement

[1] The Late Baby Boomers (born 1960-1965) were first interviewed in 2016, but we exclude them from our analysis because they only had one wave of data during our analysis.

age, we no longer measure their SSDI or SSI status.[2] For the birth years in our analysis, SSA was gradually increasing the FRA from 65 to 66; it was under age 66 for those born before 1943 (increasing by 2 months from 65 to 665 gradually), exactly 66 years for those born from 1943 through 1954, then again increasing gradually to age 67 for those born later. In our cohort analysis, we categorize respondents in each wave into four groups (1) interviewed, (2) not interviewed (but alive), (3) dead (but not yet FRA), and (4) interviewed, but reached FRA.

[2] At FRA, SSDI benefits convert to Social Security retirement benefits automatically. SSI benefits transition from disability to old age at age 65, but for purposes of aligning the cohorts, we counted them through FRA; we discuss the implications of this decision in the results section.

Table 1. *Timing of HRS Cohort Entry and Interview Waves Used in Analysis*

	HRS Survey Wave												
Birth year	**1992**	**1994**	**1996**	**1998**	**2000**	**2002**	**2004**	**2006**	**2008**	**2010**	**2012**	**2014**	**2016**
HRS													
1936-1937	**X**	57-58	59-60	61-62	63-64	65-66							
1938-1939	**X**	55-56	57-58	59-60	61-62	63-64	65-66						
1940-1941	**X**	53-54	55-56	57-58	59-60	61-62	63-64	65-66					
War Baby													
1942-1943				**X**	57-58	59-60	61-62	63-64	65-66				
1944-1945				**X**	55-56	57-58	59-60	61-62	63-64	65-66			
1946-1947				**X**	53-54	55-56	57-58	59-60	61-62	63-64	65-66		
Early Baby Boomer													
1948-1949							**X**	57-58	59-60	61-62	63-64	65-66	
1950-1951							**X**	55-56	57-58	59-60	61-62	63-64	65-66
1952-1953							**X**	53-54	55-56	57-58	59-60	61-62	63-64
Middle Baby Boomer													
1954-1955										**X**	57-58	59-60	61-62
1956-1957										**X**	55-56	57-58	59-60
1958-1959										**X**	53-54	55-56	57-58

Note: X indicates the first wave the cohort was interviewed by the HRS, at ages from 51-56. Shaded cells indicate the survey waves from which we used data from each cohort. The value shown in each cell is the approximate age range of the birth cohort during the survey wave.

HRS Consent Requirements and Implications for Sample Selection

The SSA administrative linkage to the HRS is only available for respondents who consented to having their records linked and who provided the requisite information to facilitate a linkage (accurate Social Security number, name, date of birth, and gender). The consent process has changed over the years of the HRS, as described in more detail in Appendix A. Importantly for our analysis, the SSA 831 files and DAF are available only for respondents who consented to the linkage in 2006 or later, meaning that earlier cohorts had the opportunity to initially consent, but may not have provided the requisite permissions to be in our analysis of administrative data.

Table 2 shows the full unweighted sample size for each cohort in our analysis, as well as the share of each cohort who consented to the linkage to SSA benefits data, ever and in 2006 or later. Over time, the share of each cohort consenting to any linkage has declined, from 88.0 percent in the HRS cohort down to 78.6 percent of Middle Baby Boomers. Despite the declining rate of consent, the rate of consenting in 2006 or later increases across the cohorts, from 49.0 percent among the HRS cohort to 77.4 percent of the Middle Baby Boomers. The lower rate in earlier cohorts reflects the fact that those cohorts had a longer elapsed time from survey entry through 2006, over which many of the respondents left the sample, died, or did not reconsent. In what follows, we refer to sample that consented in 2006 or later the "consenter sample" for ease of terminology, noting that this excludes those who consented in an earlier year. Appendix Table B.1 provides more detail on the interview and consent status of each cohort by birth year and HRS wave.

Table 2. *Sample Size of Each HRS Cohort, by Consent Status*

	Number of respondents	Never consented	Consented pre-2006[a]	Consented 2006 or later	Share ever consenting to linkage	Share with 2006 or later consent
HRS	5,604	670	2,186	2,748	88.0	49.0
War Baby	3,090	473	656	1,961	84.7	63.5
Early Baby Boomer	3,369	578	449	2,342	82.8	69.5
Middle Baby Boomer	4,782	1,019	59	3,703	78.6	77.4

[a] Some of the sample members in the Early Boomer and Middle Boomer cohorts were initially interviewed as younger spouses of respondents in earlier cohorts. We included these respondents based on their own birth year cohort, but they were able to provide consent to the linkage before their birth year entry cohort while in the same as an age-ineligible spouse.

Source: Authors' calculations using the RAND-HRS and SSA data linkage. Sample sizes are based the age-eligible cohort at survey entry year and do not include age-ineligible spouses or spouses added in subsequent survey waves.

Consistent with earlier work (HRS, March 2021), we found that the consenter sample has different characteristics than the full HRS sample (Appendix Table B.2). In brief, we find that respondents who consent to linkage are more likely to be white, female, and employed, have higher education, longer work histories, and lower rates of chronic conditions including heart disease, lung disease, diabetes, and stroke. Consenters report lower rates of smoking and drinking, fewer difficulties with activities of daily living (ADLs) and fewer hospital stays and doctor's visits.

Weighting

Because of the differences in the sample size and composition between those that consent and the full HRS sample, simply using the administrative linkage with the HRS survey weights will not produce nationally representative estimates. To adjust the sample weights, we predicted the likelihood of consenting in 2006 or later using a logistic regression in each survey wave following a process that the HRS uses. Our model included sex, race and ethnicity (indicators for Black and Hispanic), marital status (indicators for married, divorced, and widowed), education (indicators for high school graduate, some college, college graduate or advanced degree), an indicator for being employed, categories of self-rated health status, and quintiles of household income and wealth.[3]

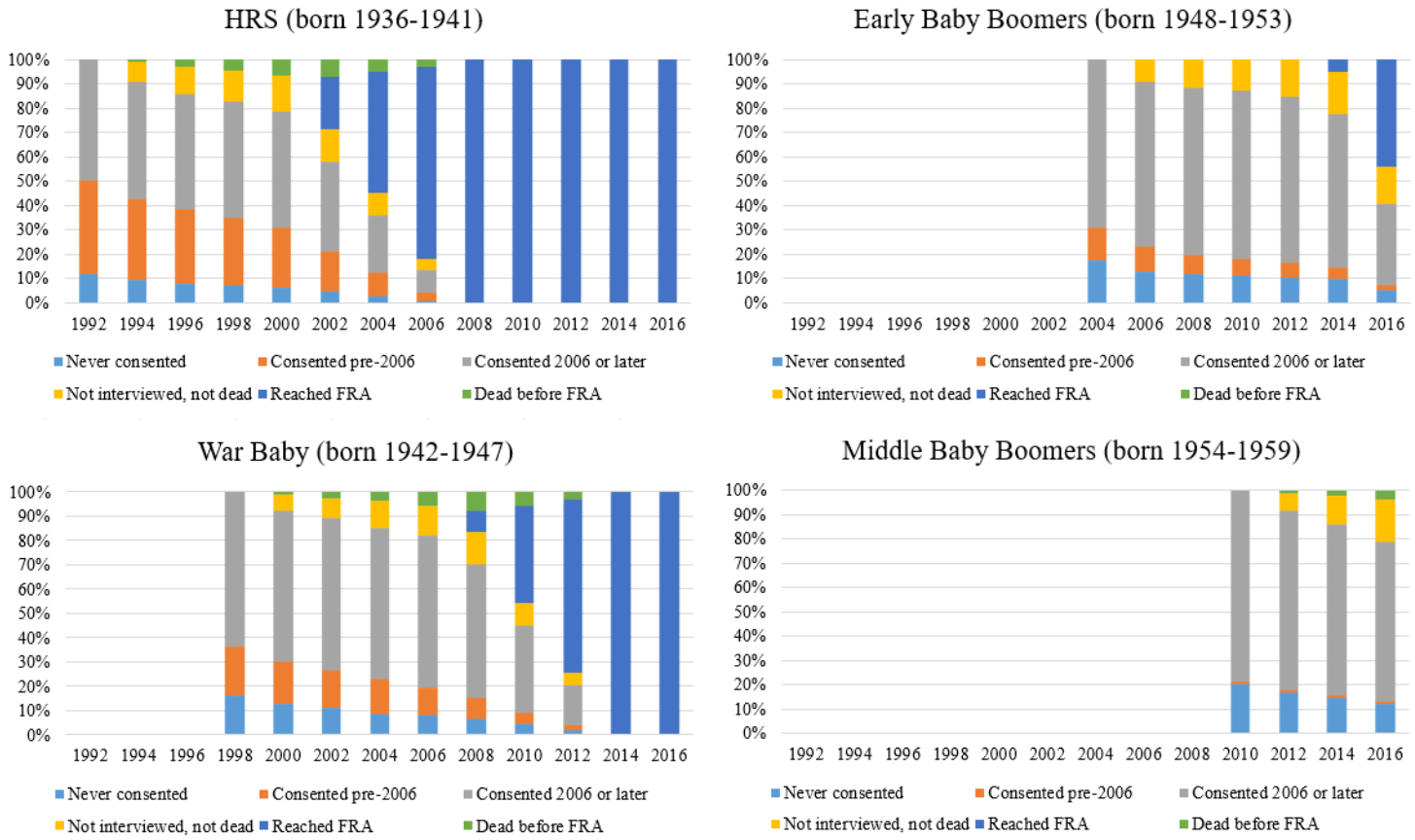
We used the predicted values from the logistic regression models to generate inverse probability weights (IPW), which we then applied along with the HRS sampling weights to the consenter sample. Applying the IPW in each wave to the survey weights yields a weighted sum of interviewed consenters in each wave that equals the weighted sample size of interviewed respondents that wave from the full HRS.

Figure 1 shows the weighted distribution of each cohort and wave, from the year of entering the survey through 2016, applying the wave-specific IPW to the baseline weights for each cohort. In the figure, gray bar shows the number interviewed in each wave who had the necessary consent to be in the SSA administrative files we use. The IPW reweighting process for analyzing the administrative data means that the weighted sum of the consenter sample (gray

[3] We used the same characteristics to predict the likelihood of consenting in 2006 or later as the HRS uses to construct its wave-specific weights for working with the SSA data. In our case, we needed to modify their process for some of the analyses that follow and could not solely rely on the weights they developed consents. We used cross-wave consistent measures of the included variables from the RAND-HRS file.

portion of the bar) equals the weighted sum of the total number interviewed in each wave (the combination of the light blue, orange, and gray bars). Over time, the share of the sample that is interviewed falls due to attrition or death. The full HRS and War Baby cohorts reach FRA before 2016, while only part of the Early Baby Boomers do (and none of the Middle Baby Boomers). Because two-year birth cohorts attain FRA over multiple survey waves, it is important to note compositional changes in the "cohort" included in our analysis in the years approaching FRA, as shown in Table 1.

Figure 1. *Interview and Consent Status of Each HRS Cohort from 1992 through 2016*



Notes: Values are weighted using the HRS sampling weight from the baseline interview in each cohort. Analogous unweighted values are contained in Appendix Table B.1.

Source: Authors' calculations using the RAND-HRS and SSA data linkage.

Measuring SSDI and SSI Application and Receipt

In this section, we describe our approach to measuring applications to and receipt of SSDI and SSI; more details are contained in Appendix A. Self-reported values are defined using cross-wave consistent measures in the RAND-HRS file. Administrative information on applications came from SSA's *Form 831* records, as linked to the HRS, while administrative records on benefit receipt were derived from the DAF. If an HRS respondent consented to the SSA linkage but did not have information available in the 831 file for either SSDI or SSI, we assume they had not applied for benefits. We follow a similar approach if they consented to the administrative linkage but did not have a record in the DAF, coding the respondent as a non-beneficiary (for the relevant program).

Application. For self-reported applications, we use the spell data available in the RAND-HRS to identify whether the person had ever reported applying for SSDI and/or SSI by the date of the HRS interview. We measure applications in SSA administrative records using *Form 831* records, which contain information on initial disability applications from 1988 onward. For both the self-reports and administrative data, we assume that if the respondent is a beneficiary (based on the comparable self-report or administrative measure), that they applied for the program at some point in the past, even if the application data do not indicate that to be the case. This is especially important in the administrative data because the 831 records began in 1988. It is therefore quite likely that sample members in the older cohorts might have applied for and begun to receive benefits before that time; we would observe them as receiving benefits but might not find their application in the 831 files. It is also possible that HRS respondents may have neglected to provide complete application data for spells that began long before their first HRS interview, despite accurately reporting current receipt data.

As described in more detail in Appendix A, there are reasons why individual self-reports of applications may not align to administrative records. Most importantly, the 831 records likely undercount what individuals themselves would report, because the former only contain applications that have received an initial determination following a complete medical review by SSA's Disability Determination Services offices. The 831 file does not include (1) applications that have not yet received an initial determination, (2) applications denied on the basis of not meeting the program's financial criteria, and (3) applications being appealed beyond the initial and reconsideration levels. Based on the questions in the HRS, all three of these scenarios would

be reported as an application by respondents. It is also possible that the 831 file contains applications that respondents may not report; for example, a respondent who applies for SSI may not know that SSA will also process an application for SSDI if eligible.

Benefit Receipt. We measured the receipt of SSDI and SSI at time of the HRS interview. For self-reports, we used wave-specific measures in the RAND-HRS indicating that the respondent was currently receiving benefits from SSDI and/or SSI. We measured the receipt of benefits based on SSA administrative records using the DAF. We measured benefit receipt in the DAF based on beneficiaries being in current payment status in the month(s) of the HRS interview.[4]

One important consideration in our measures of benefit receipt is that the HRS question wording in the earlier years allowed for uncertainty in program participation in a way that did not occur in later waves. From 1992 through 2000, respondents were asked about SSDI and SSI together. Where possible, information collected from respondents after 2000 was subsequently used to "backfill" records by RAND in the cross-wave consistent measures in the RAND-HRS for each program (e.g. replacing "SSDI or SSI" with "SSDI but not SSI" based on later reports). It was not possible in all cases (for example, if a respondent died or left the sample), and prior to 2000, so a fair amount of uncertainty remains about the program under which respondents applied for or received benefits. After 2000, the survey questions on disability benefit receipt were separated by program.

To be the most consistent across time, we opted for a "narrow" measure in which we did not account for application/receipt from an unknown program, limiting our applicants and beneficiaries only to those for whom definitive information about the program was available. (For example, respondents who did not ever clarify whether they received benefits from SSDI or SSI were classified as not being beneficiaries.) Based on our review of patterns over time, the narrow measure we use likely understates program participation before 2000.[5]

[4] In cases where the HRS interview spanned multiple months, we looked for benefit receipt in any of those months in the administrative data.

[5] In the earliest years of the survey (1992 and 1994), many of the application and receipt reports were not reconciled. SSDI application and receipt prevalence rates that included the unknown program category were 2-3 times higher than those we report, and SSI application and receipt rates that were 7-10 times higher. The magnitude of the difference got smaller in each year through 2000, presumably reflecting a higher likelihood of reinterviewing respondents in 2000 or later that allowed for the record to be updated.

Profiles of SSDI and SSI Application and Receipt by Time and Cohort

To start, we consider the aggregate alignment of survey and administrative reports in each year, incorporating all four of our cohorts. In general, self-reported applications to and receipt of SSDI and SSI are lower than comparable administrative reports. However, the rates of new applications and receipt over time are quite similar. Figure 2 shows the profile of each of the four measures of interest in each HRS interview year from 1996 through 2016 for the cohorts included in our analysis. The black line shows self-reports, while the gray line shows administrative values, where both have been weighted to be nationally representative; the former using HRS sampling weights and the latter using the IPW method above to reweight the consenter sample to the same overall population size.

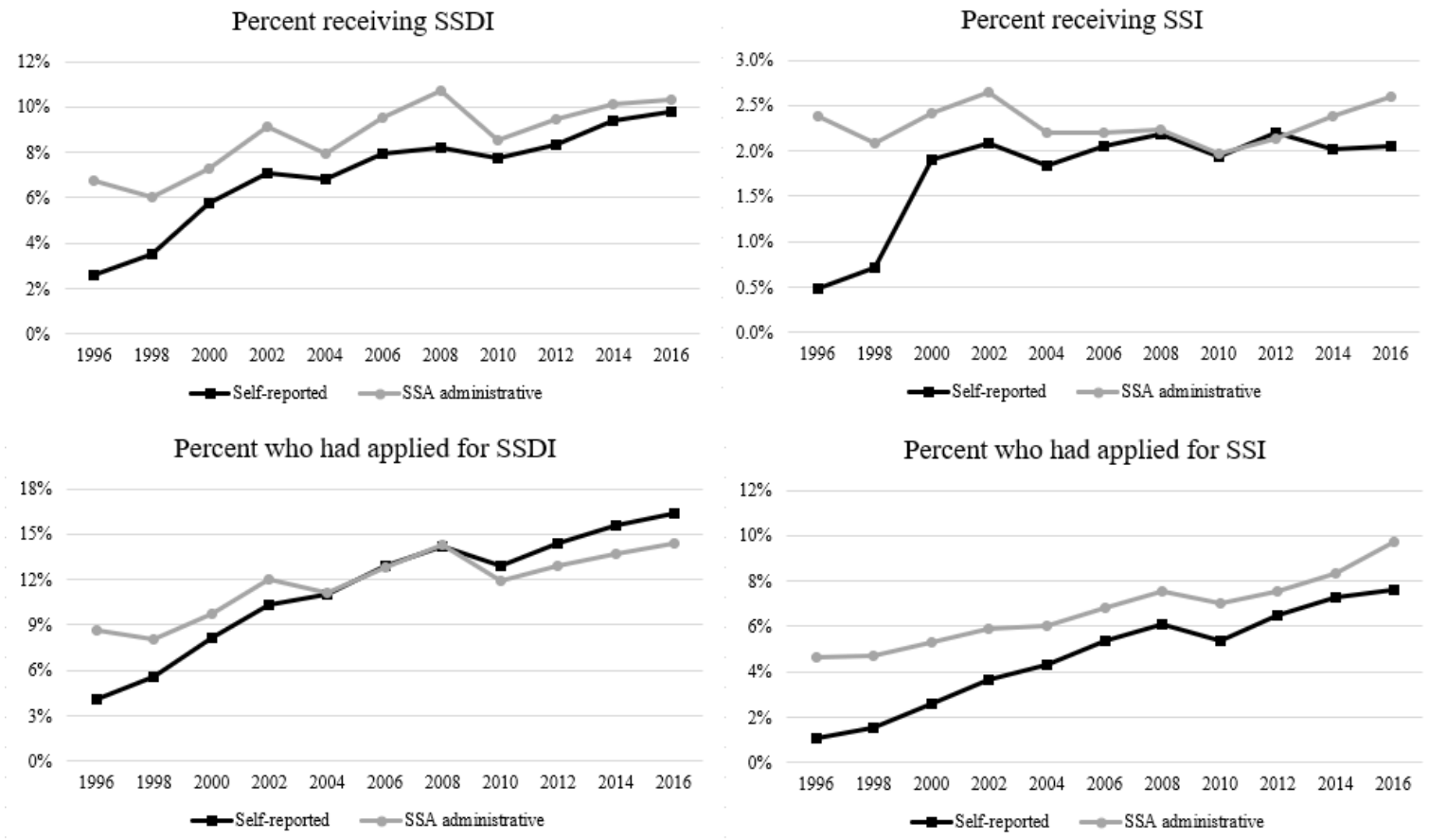
Starting with SSDI, we see that both self-reported and administrative measures of receipt generally increase over the period. Self-reported values of receipt are always lower than the measure using administrative data at the same time, with the former increasing from about 2 percent in 1996 to just under 10 percent in 2016 and the latter increasing from 7 percent to just over 10 percent over the same period. The share who had ever applied for SSDI at each point is lower based on self-reports than administrative records through 2004, almost identical through 2008, after which the self-reports are higher than administrative values. Self-reports start with around 4 percent reporting having applied for SSDI in 1996 and rise to 16 percent by 2016, while administrative records show about 8 percent had applied by 1996 and 14 percent by 2016. The patterns over time are consistent with increasing SSDI receipt over the period, though the addition of new, younger cohorts in 1998, 2004 and 2010 obscure some of the patterns of the aging of the earlier cohorts. The youngest cohort was 51-56 in 2010 and had aged 6 years by the last year, showing an application and receipt pattern consistent with increased SSDI receipt with age.

Despite level differences in SSDI receipt and application in self-reports and administrative data, both sources show similar patterns in new receipt and applications over the period. The slopes of the lines measure new receipt and/or application and are therefore analogous to incidence of program application or participation. The slopes of the lines for SSDI receipt are relatively similar at most points after 2000 (when the HRS began asking separate questions about SSDI and SSI), except for the period during the Great Recession, where the

administrative values had more marked changes than self-reports. After 2000, the slopes are quite similar for SSDI applications as well.

In general, self-reported values of applications and receipt of SSI are also lower than administrative data, though the difference between the two are more modest than for SSDI, especially after 2000. As mentioned above, prior to 2000, the HRS queried respondents about SSDI and SSI in the same question, with the RAND-HRS separating responses where possible later. Because we only accounted for known program status, and the SSI values are substantially lower using that measure than one that accounts for uncertainty (not shown). After 2000, the difference between self-reported and administrative values were relatively modest, fluctuating between 2 and 2.5 percent in each year. The share of respondents who had ever applied for SSI increased from 0.5 percent in 1996 to almost 8 percent by 2016 based on self-reports compared with a change from 4.5 to nearly 10 percent based on administrative values.

Figure 2. *SSDI and SSI Application and Receipt in HRS Survey Waves from 1996 through 2016*



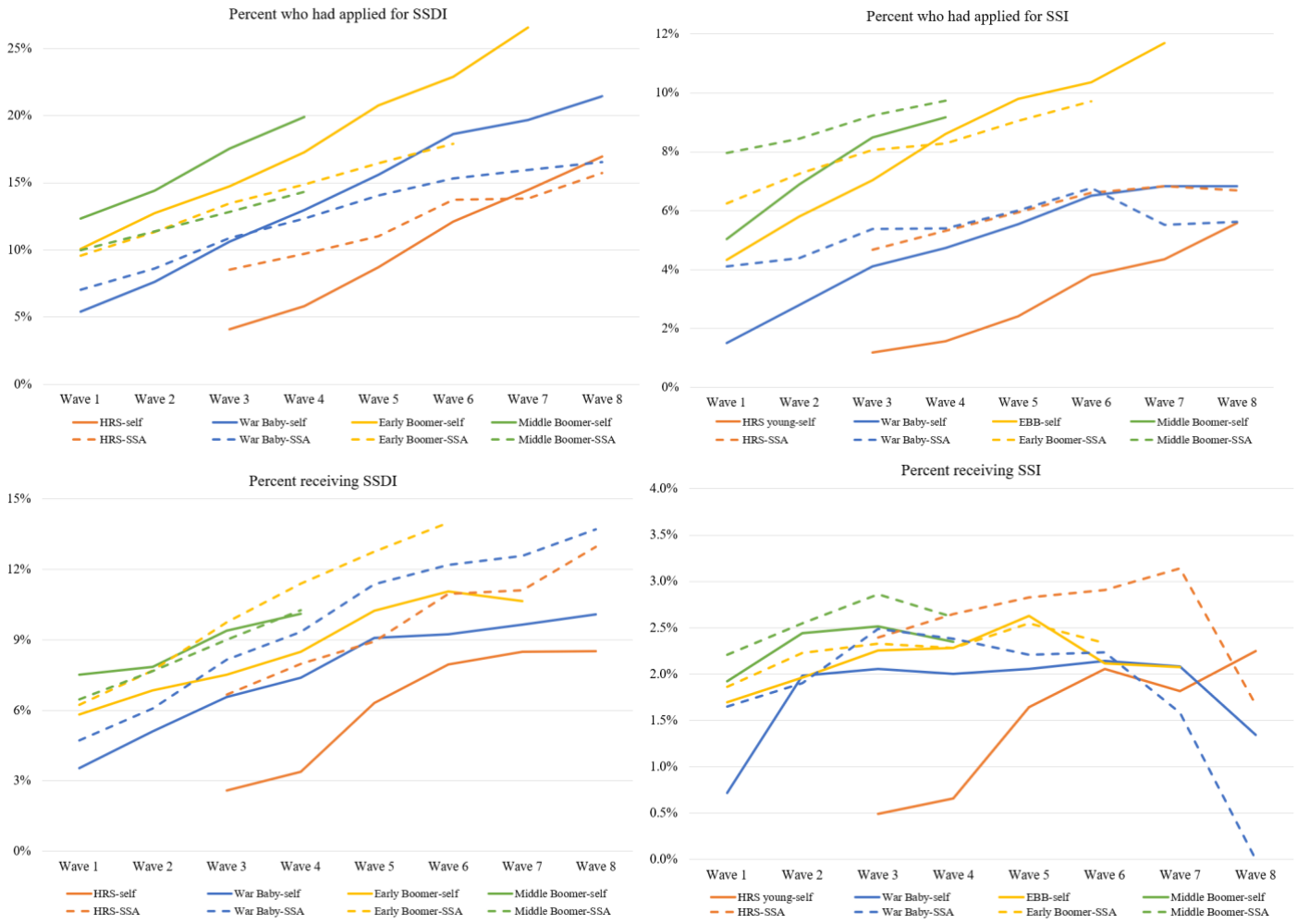
Notes: Limited to respondents born from 1936 through 1959 and part of the HRS, War Baby, and Early and Middle Boomer cohorts of the HRS. Values are weighted to produce nationally representative estimates in the year, as described in the text.
Source: Authors' calculations using the RAND-HRS and SSA data linkage.

The annual values in Figure 2 combine patterns over time based on secular patterns in experience with federal disability programs, differences in patterns across HRS cohorts (reflecting a range of factors including labor market conditions experienced by each cohort and sufficient labor force participation to be insured for SSDI), as well as aging of cohorts in the HRS as they are followed over time. We next disaggregate the data shown in Figure 2 to highlight differences in self-reported and administrative values for each cohort in our analysis. Figure 3 highlights the same four outcome measures, but the horizontal axis has been reoriented from calendar time to the wave of the HRS interview relative to the first interview for each of four cohorts. As shown in Table 1, the HRS cohort was first interviewed in 1992, the War Baby cohort in 1998, the Early Baby Boomers in 2004 and the Late Baby Boomers in 2010. In each case, that wave is "wave 1" in Figure 3; the HRS cohort therefore does not have data until wave 3 which occurred in 1996 when the DAF data began.

In Figure 3, the solid line for each cohort represents the self-reported value in the wave relative to sample entry, while the dashed line of the same color represents the value from the administrative data. The figure does not show that there are strong patterns by cohort across all four measures, either comparing across cohorts or comparing self-reports to administrative records. More recent cohorts tend to overstate their receipt of SSDI relative to administrative records, aligning with the pattern shown in Figure 2 where self-reported receipt exceeds the administrative record in the later years of our analysis period. Patterns are less clear for SSDI application or the SSI measures. One pattern for SSI receipt is a product of our sample definition: we include respondents through FRA but the SSI program after age 65 reflects old-age benefits; this may explain the declining SSI receipt among self-reports in the last waves for the cohorts that reach FRA. Those cohorts also may be misreporting SSI as OASI at those points, though we did not explore that possibility.

Maestas et al. (2015) found increased SSDI participation during and following the Great Recession of 2008; we would expect to see this primarily in 2010 given the HRS survey timing. This corresponds to Wave 7 for the War Baby Cohort and Wave 4 of the Early Baby Boomers. We do not see notable deviations from the previous trend in SSDI or SSI application or receipt at that point for those cohorts, either in the self-reported or administrative data. By wave 7 of the War Baby cohort, much of the sample had passed the earliest age of retirement at 62, so it may be that the cohort claimed OASI early and did not meet the criteria for SSDI.

Figure 3. *SSDI and SSI Application and Receipt for each HRS Cohort from Entry through FRA or 2016*



Notes: Limited to respondents born from 1936 through 1959 and part of the HRS, War Baby, and Early and Middle Boomer cohorts of the HRS. Values are weighted to produce nationally representative estimates in the year, as described in the text.
Source: Authors' calculations using the RAND-HRS and SSA data linkage.

Age Profiles of SSDI and SSI Application and Receipt

Next, we examine reporting of SSDI and SSI applications and benefits by age. To do this, we reoriented the data collected across many years, such that all respondents are "stacked" by the same age (i.e., 51-52, 53-54, etc.),[6] regardless of the corresponding data wave. This structure allows direct comparisons by age but does not consider compositional effects of cohorts or time. These results are weighted using our IPW method described above but run by age interval rather than by wave. We then apply the IPW to the wave weight available in the RAND-HRS for the respondent at the relevant age. These estimated are therefore nationally representative of the age group across all of the survey years.

Figure 4 displays the percentage of respondents who self-reported SSDI and SSI application and/or receipt alongside corresponding percentages from SSA administrative records. We show values at each age and interpret these values as a measure of wave-specific prevalence of having applied to or receiving benefits. It is important to note that not all the HRS cohorts have data at each of the ages; the values shown include all of the respondents at each age who had data available. Table 1 highlights the years from which we identified respondents of a particular age and cohort. For example, 51-to-54-year-olds are not included from the HRS cohort because they were interviewed in 1992 and 1994, but our analysis begins in 1996. On the other end of the age range, the Middle Boomers were last interviewed when ages 57-62. We include the information we have available at each age, meaning that these analyses are not for cohorts across the full age range we consider.

We report SSDI and SSI separately by program and also combined across programs. The combined measure is designed to account for individuals who may know they have interacted with a disability program administered by SSA but may incorrectly recall the program. If misreporting reflects confusion of the program reported, we would expect this combined measure to more closely align with SSA records than either of the individual program measures.

The top bar, in blue, corresponds to self-reports from the full HRS sample; this is the value that users without access to the administrative linkage would report. The gray bar reflects

[6] Note that the "age" we use is based on HRS survey wave and birth year, rather than actual age at interview, to avoid issues with birth dates and HRS interviews that are not necessarily exactly two years apart. For example, a respondent with a birth year of May 15, 1947, might have been 53 when interviewed by the HRS on May 31, 2000. Yet when interviewed again on April 1, 2002, would only be 54. We would classify this respondent in the 53-54 age bin in 2000 and the 55-56 age bin in 2002.

the corresponding reports in the SSA administrative data, limited only to consenters. The blue and gray bars mirror information reported by cohort and year earlier, simply transformed to report by age instead. The middle orange bar represents self-reports from the HRS but is limited to those who consented to SSA administrative linkage. The purpose of adding this bar is to consider how different self-reports are among consenters relative to the full HRS sample (comparing the blue and orange bars) and how different self-reports among consenters are from their administrative linkage (comparing the orange and gray bars).

Figure 4 confirms again that HRS self-reports are generally lower than administrative records for both the full sample and the subset who have consented to a data linkage. This is true for SSDI receipt and SSI application and receipt (with the exception of SSI receipt at age 65 and older). [7] In the case of SSDI applications, self-reports are higher than the administrative records until age 60, after which the pattern switches. Despite finding that that respondents who consent to the SSA data linkage differ on a number of demographic and health characteristics, the aggregate patterns of reporting on application and receipt do not differ substantially between consenters and the full HRS sample.

There is not a significant age gradient in the observed gaps between self-reports and administrative reports; we expected we might see substantially more misreporting after age 62 when respondents could claim Social Security retirement benefits. There is modest evidence that misreporting of benefits increases as respondents reach the earliest age of eligibility for Social Security retirement benefits at age 62. For example, self-reports and administrative measures of SSDI are much closer at ages 55-56 than at 63-64. Yet, we do not observe a similar pattern for SSI, nor do we see that the combination of SSDI and SSI produces values that are substantially closer across self-reports and administrative values. It is important to note that because the composition of the sample is changing with age given the availability of data at older ages for more recent cohorts, we cannot definitively conclude that self-reports at older ages reflect (or do not reflect) confusion over the program from which benefits are being claimed.

[7] The pattern at age 65-66 for SSI should be interpreted with caution; the SSI program after age 65 may be for old age benefits rather than for disability. For consistency's sake and to align with the DAF STW measure, we used this value through full-retirement age, but there are reasons to think this comparison may reflect a different set of considerations than at younger ages.

Figure 4. *Comparisons of Percentage of SSDI and SSI Application and Receipt, by Age*

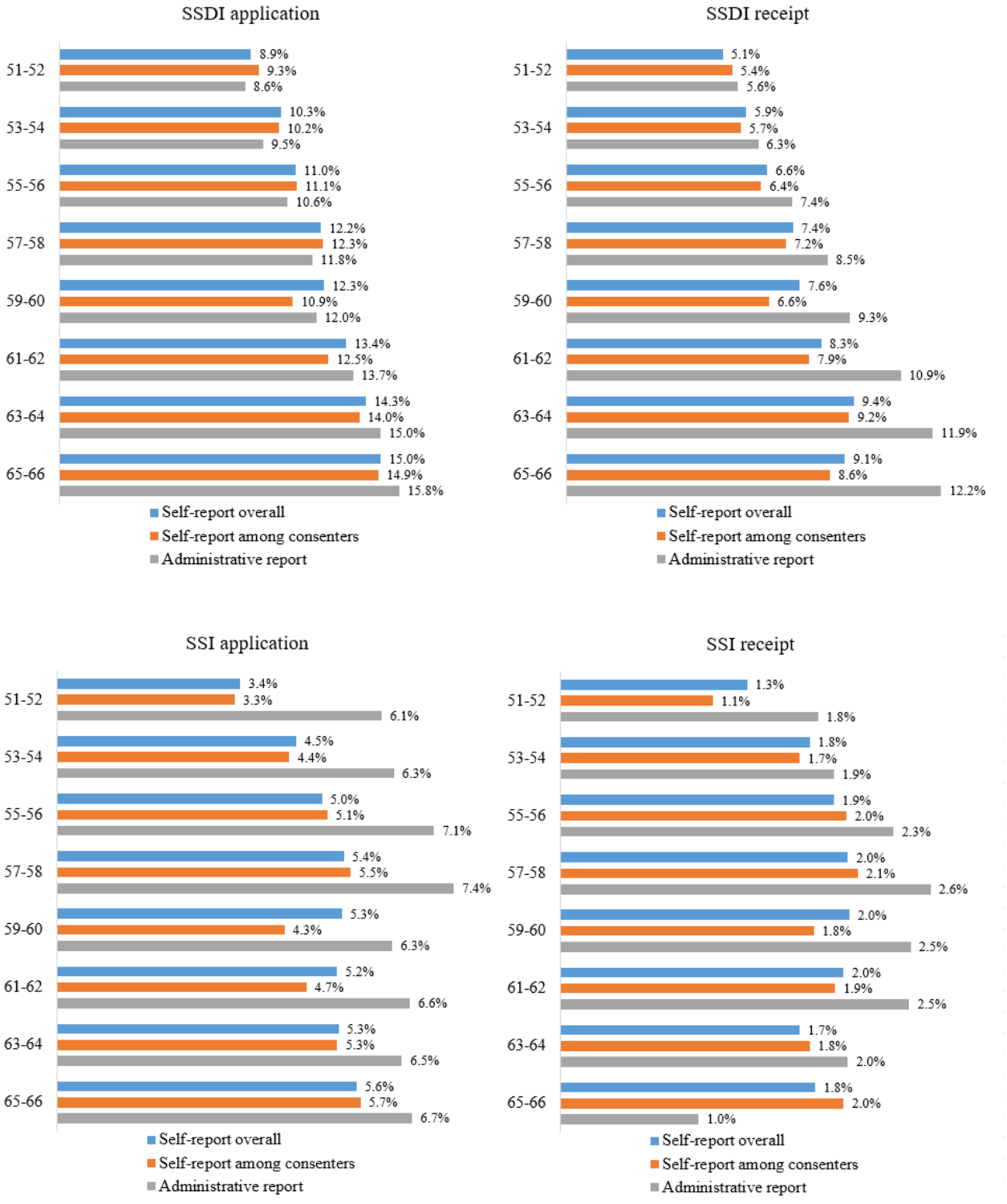
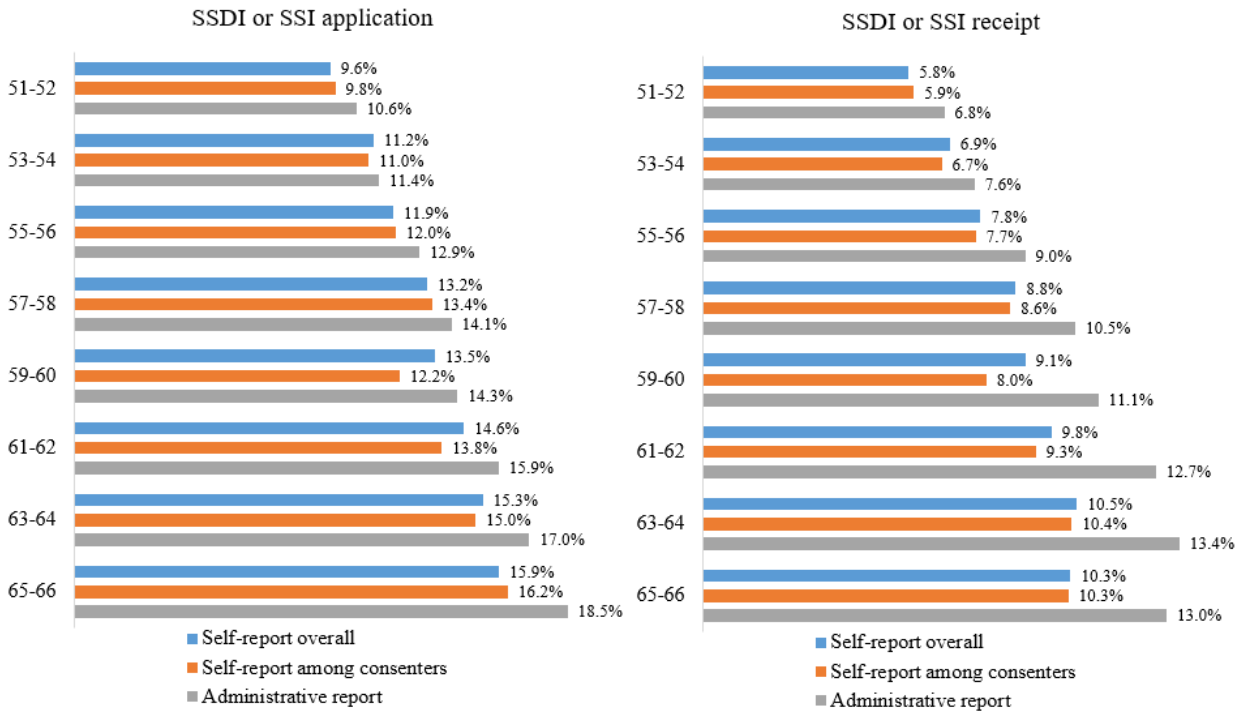


Figure 4. *Comparisons of Percentage of SSDI and SSI Application and Receipt, by Age* (cont'd)



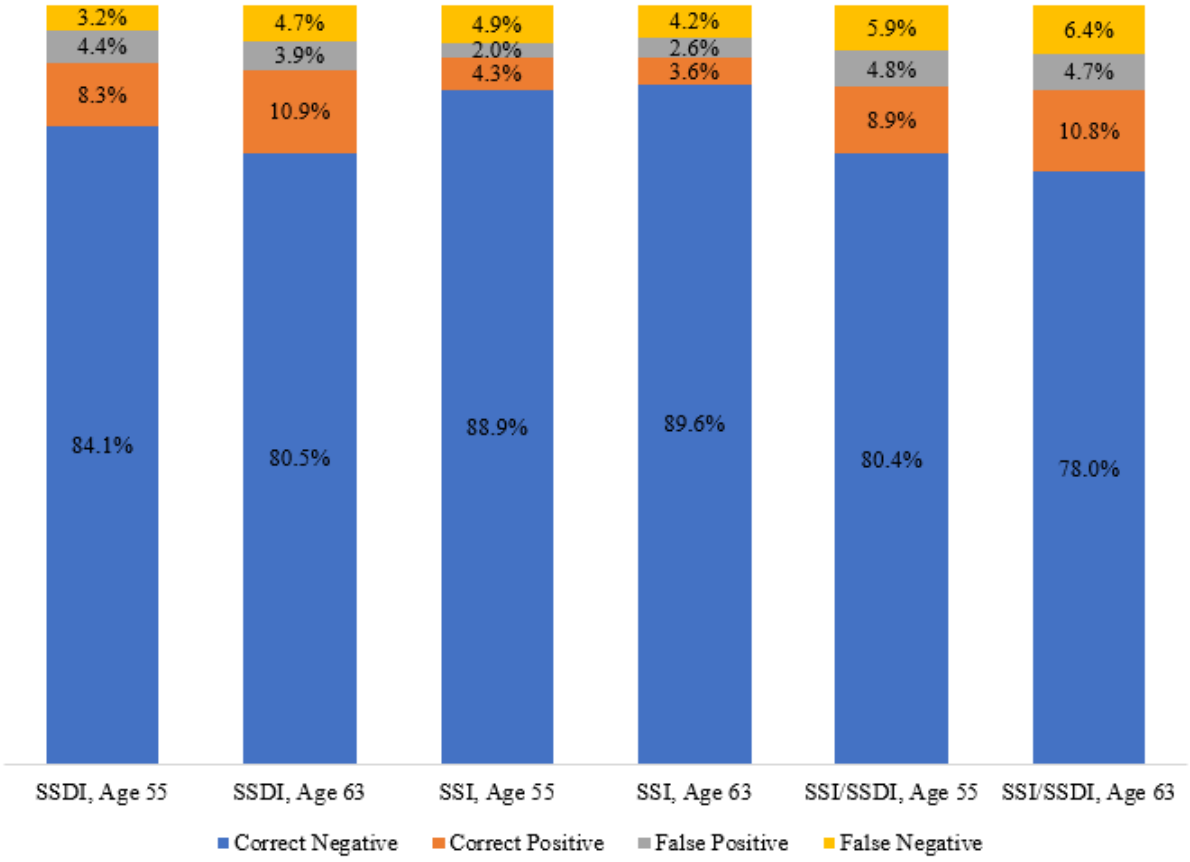
Notes: Limited to respondents born from 1936 through 1959 and part of the HRS, War Baby, and Early and Middle Boomer cohorts of the HRS. Values are weighted to produce nationally representative estimates at each age, as described in the text. SSDI or SSI refers to the total number of respondents who report either program; some respondents report only one program and some report to both.
Source: Authors' calculations using the RAND-HRS and SSA data linkage.

The Individual Accuracy of Self-Reported Responses About SSDI and SSI Application and Receipt

Having described patterns of reporting in the aggregate—by wave, cohort, and age—we now turn to describing the accuracy of individual self-reports. We focus on two age groups, 55 years old, the age at which there are likely to be the greatest number of respondents with data, and 63, prior to FRA. For both SSDI and SSI, we categorize reporting into one of four groups. ***Correct negative*** means that a respondent reports not having applied for or is receiving SSDI (or SSI) and the corresponding administrative record concurs. Likewise, ***correct positive*** means a concurrence in self-reports and administrative data for respondents who have applied or received benefits. A ***false positive*** misreport indicates that a respondent indicates they *have* applied or are receiving benefits whereas administrative records do not indicate application or receipt. Finally, a ***false negative*** misreport is the opposite—respondents report no application or receipt and administrative data does record an application or receipt. We report all data on misreports without using sampling weights; we are interested in the likelihood of misreporting by groups of respondents and therefore nationally representative estimates are not appropriate in this context.

Figure 5 displays the distribution of reports for SSDI and SSI applications, at age 55 and 63, by their accuracy. The blue segment of each bar correct negatives. Because a minority interact with disability programs, this segment of the bar is the largest, representing 85 to 90 percent of all respondents. The orange segment of the bar represents correct positives; this segment is far smaller than the blue bar simply because relatively few older adults receive benefits. The gray and yellow segments of the bars show false positives and false negatives, respectively. Together, these bars represent the share who misreport their benefits, which is small relative to the full sample; 7-8 percent of HRS respondents misreport SSDI applications.

Figure 5. *The Accuracy of Self-reported SSDI and SSI Applications at Ages 55 and 63*



Notes: Limited to respondents born from 1936 through 1959 and part of the HRS, War Baby, and Early and Middle Boomer cohorts of the HRS. Values are unweighted. "SSDI/SSI" refers to the total number of respondents who report either program; some respondents report only one program and some report to both.
Source: Authors' calculations using the RAND-HRS and SSA data linkage.

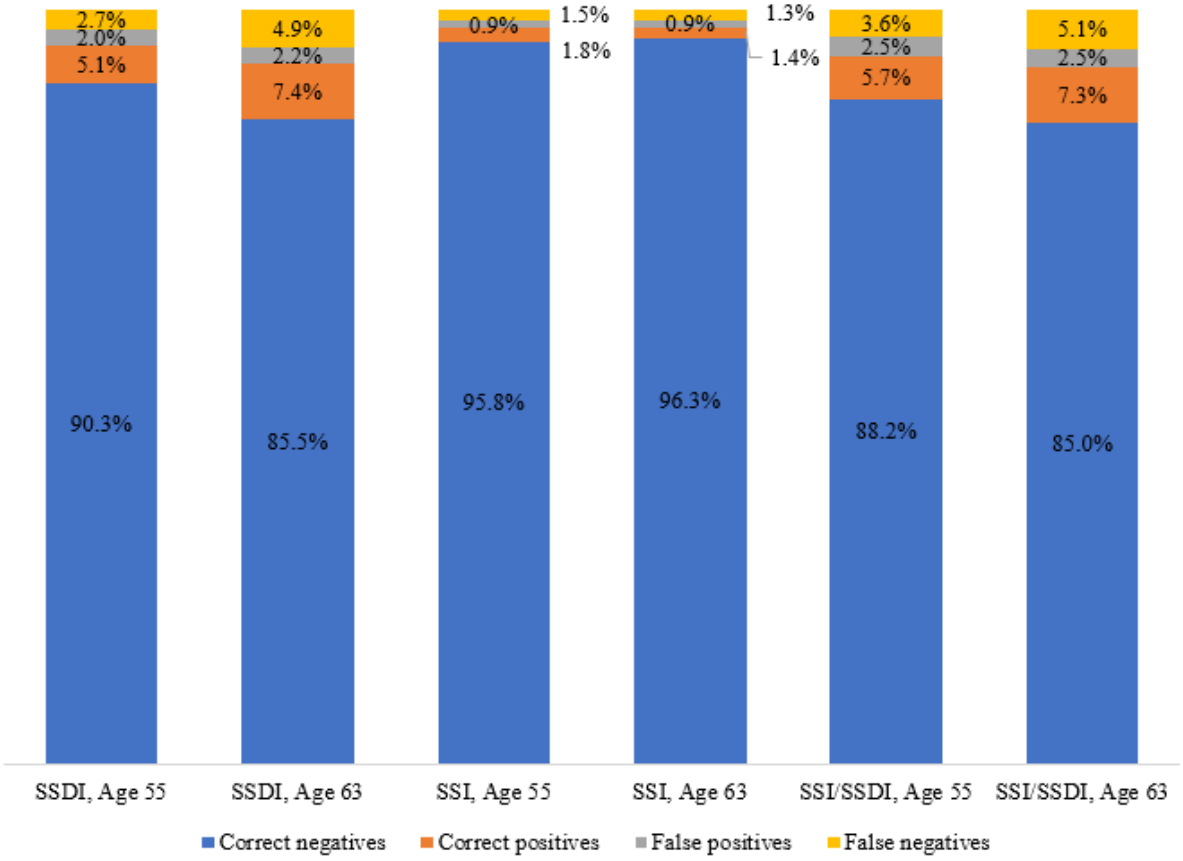
Another way to consider the magnitude of misreporting is to consider false reports as a share of total reports within a given category. This allows for a much closer inspection of the effect of misreporting on aggregate values. For example, consider SSDI applications at age 63 (Figure 5), where 18.6 percent of the total respondents with a self-report or administrative record indicated an application. The share of false positives (3.9 percent) is close to the share of false negatives (4.7 percent), yet false negatives represent a lower share of the total negatives than false positives relative to total positives. This means that positive self-reports are more likely to be wrong relative to the administrative record; 26.4 percent of positive self-reports were incorrect (3.9 of 14.8 percent) compared to only 5.5 percent of negative self-reports (4.7 of 85.2

percent). Other than SSDI applications at age 55, the share of reports that is false negative is larger than share that is false positive.

Figure 6 displays similar results for the receipt of benefits at ages 55 and 63, with similar patterns. Overall, correct negatives are the largest share of reports, consistent with disability program participation. While misreports are a small share of the total, they are much larger when compared to total positive reports. Again, we see that for these outcomes, false negatives are more common than false positives.

It is helpful to compare the distributions in Figures 5 and 6 to the total misreports in Figure 4. In Figure 6, the percentage of receipt of a program is the sum of correct positives and false negatives. For example, the percent of respondents receiving SSDI at age 55 from Figure 6 is 7.1 percent—5.1 percent (correct positives) plus 2.0 percent (false positives). The equivalent value in Figure 4 is represented by the orange bar, self-report for those who consent to a linkage and therefore have a corresponding administrative record from which we can assess misreporting. In this case, the percent of 55-year-olds with an SSDI application is 6.4 percent. Because the values in Figure 4 are weighted and those in Figures 5 and 6 are not, we expect these values to be similar—as they are—but not necessarily identical.

Figure 6. *The Accuracy of Self-reported SSDI and SSI Receipt at Ages 55 and 63*



Notes: Limited to respondents born from 1936 through 1959 and part of the HRS, War Baby, and Early and Middle Boomer cohorts of the HRS. Values are unweighted. "SSDI/SSI" refers to the total number of respondents who report either program; some respondents report only one program and some report to both.
Source: Authors' calculations using the RAND-HRS and SSA data linkage.

We sought to understand the characteristics of respondents who misreported, to assess whether misreporting is concentrated in particular subgroups. In Tables 3a and 3b, we examine selected differences in demographic and health characteristics for respondents who misreported the receipt of benefits. We focus on receipt of benefits simply to avoid a vast number of comparisons; results from a similar analysis for application are available upon request. In Table 3a, we compare differences between the false positive group relative to the correct positive group. In Table 3b, we compare differences between the false negative group and correct negative group.

These tables contain several simplifications to aid in interpretation. First, we limit to characteristics in which we identified statistically significant differences between those who

report correctly versus those who misreport in at least one of the outcomes we considered. To simplify the presentation further, we focus on groups of variables (e.g., race includes white, Black and other where we tested the difference in the racial distribution of the groups). A check in the box indicates that the mean or distribution of the variable category shown was statistically different across the two groups. Appendix Tables B.3 and B.4 contain full results of these comparisons.

Starting with Table 3a, we find that there are differences between those who misreported that they were receiving benefits (false positives) relative to those who correctly reported they were receiving benefits (correct positives). We do not observe consistent patterns in the characteristics correlated with misreporting across program or age. For 55-year-olds, misreporters of SSDI receipt differed from correct reporters by race, gender, marital status, educational attainment of respondents. Those with false positive reports for SSDI at age 55 were also more likely to report poorer health (with higher prevalence of high blood pressure and a higher self-reported probability of having a work-limiting health condition in the next ten years) and had worked for fewer years. At age 63, respondents with false positive for SSDI receipt were twice as likely to be Hispanic, had an average of nearly one less year of education, had an average of four less years of employment over their lifetimes, and scored higher on the CESD mental health test.

We also observe demographic and health differences for false positive reports among 55-year-olds relative to correct positives for SSI, but they are not the same characteristics as for SSDI. SSI misreporters differ from correct reporters on race and ethnicity, as well as on average income and assets. Notably, false positive reporters are more likely to have higher incomes and assets (which might be expected, given the income and assets limits for SSI). There are also health differences between false and correct positives; those with false positive reports tend to have better health behaviors but report worse health. Those with false positive reports are less likely to be smokers, report drinking fewer alcohol drinks per day, are less likely to report having a psychological problem, have had more hospital stays in the last two years, and have higher out-of-pocket medical expenditures. In general, the patterns of differences in misreporting SSI at age 63 reflect a different set of characteristics than at age 55.

Table 3b reveals that there are consistent differences between false negative and correct negative reporters, across age and program. In fact, we find that there are statistically significant

differences across most individual characteristics. This pattern may not be particularly surprising for two reasons. The first is sample size; correct negatives include all respondents that have no program interaction with SSDI or SSI, which as shown in Figure 6, is the majority of the sample. As such, sample sizes may be better powered to detect statistically significant differences in characteristics. The second is the underlying truth in program participation. False negative reporters are those actually receiving benefits and therefore meeting the financial and health characteristics of the program. Because beneficiaries have significant health and functional impairments and are generally out of the labor force, the differences in socioeconomic and health characteristics are to be expected.

Table 3a. *Differences in Demographic and Health Characteristics among Those Reporting Benefit Receipt (check mark shows statistically significant differences between false positives and correct positives[1])*

	Age 55 receipt status		Age 63 receipt status	
	SSDI	**SSI**	**SSDI**	**SSI**
Demographic characteristics				
Race	✓	✓		
Ethnicity		✓	✓	
Gender	✓			
Marital status	✓			
Socioeconomic characteristics and employment				
Education (years)	✓		✓	
Income	✓	✓		✓
Assets		✓		✓
Working for pay				✓
Self-reported probability of work-limiting health condition in ten years	✓		✓	
Total number of years worked	✓		✓	✓
Health characteristics and behaviors				
Has high blood pressure	✓		✓	
Has lung disease				
Has psychiatric problems				
Current smoker		✓		
Number of alcoholic drinks per day		✓	✓	✓
Body mass index (above 30 indicates obesity)				✓
CESD mental health score[2]				✓
Number of hospital stays in two years		✓		✓
Have visited the doctor in two years				
Out of pocket medical expenditures		✓		✓
N (Correct positives)	437	156	492	95
N (False positives)	173	79	144	60

[1] We used a t-test to compare the difference in means and a chi-square test to assess the difference in distributions. When we tested the distribution, the test statistic is shown for the category heading.
[2] Depressive symptoms measured by the Center for Epidemiological Studies Depression (CESD), an 8-point battery.
Notes: All values are taken at the ages 55 or 63, respectively, and all dollar values are inflated-adjusted to 2020 dollars.
Source: Authors' calculations using the RAND-HRS and SSA data linkage.

Table 3b. *Differences in Demographic and Health Characteristics among Those Not Reporting Benefit Receipt (check mark shows statistically significant differences between false negatives and correct negatives[1])*

	Age 55 receipt status		Age 63 receipt status	
	SSDI	**SSI**	**SSDI**	**SSI**
Demographic characteristics				
Race	✓	✓	✓	✓
Ethnicity		✓	✓	✓
Gender		✓		✓
Marital status	✓	✓	✓	✓
Socioeconomic characteristics and employment				
Education (years)	✓	✓	✓	✓
Income	✓		✓	✓
Assets	✓	✓	✓	✓
Currently working for pay	✓	✓	✓	✓
Probability living to 75/working to 65	✓	✓	✓	
Probability of work-limiting health condition in next decade		✓	✓	
Tenure from longest held job	✓	✓	✓	✓
Total years worked	✓	✓	✓	✓
Health characteristics and behavior				
Self-reported health status	✓	✓	✓	✓
Health problems currently limit work	✓	✓	✓	✓
Doctor has ever diagnosed:				
Blood pressure	✓	✓	✓	✓
Diabetes	✓	✓	✓	✓
Lung disease	✓	✓	✓	✓
Heart disease	✓		✓	✓
Stroke	✓	✓	✓	
Psychiatric problems	✓	✓	✓	✓
Arthritis	✓	✓	✓	✓
Number of diagnosed health conditions	✓	✓	✓	✓
Memory problems	✓		✓	
Back problems	✓	✓	✓	✓
Ever smoked/ Smoked now (%)	✓	✓	✓	✓
Number of alcoholic drinks per day	✓		✓	✓
CESD mental health score[2]	✓	✓	✓	✓
Number of ADL or IADL difficulties3	✓	✓		
Hospital stays in previous two years (%)	✓	✓		
Number of doctor visits in previous two years	✓			
Out of pocket medical expenditures	✓	✓		
N (Correct negatives)	7,795	8,273	5,655	6,370
N (False negatives)	231	128	322	88

[1] We used a t-test to compare the difference in means and a chi-square test to assess the difference in distributions. When we tested the distribution, the test statistic is shown for the category heading.
[2] Depressive symptoms measured by the Center for Epidemiological Studies Depression (CESD), an 8-point battery.
[3] Activities of Daily Living (ADLs) and Instrumental Activities of Daily Living (IADLs) are marked 0-5 to represent the number of ADLs/IADLs in which the respondent reports at least some difficulty.
Notes: All values are taken at the ages 55 or 63, respectively, and all dollar values are inflated-adjusted to 2020 dollars.
Source: Authors' calculations using the RAND-HRS and SSA data linkage.

Comparing Aggregate Beneficiary Counts in the HRS Self-Reports and Administrative Linkage to SSA Published Statistics

So far, we have considered the comparison within the HRS respondents of self-reports and administrative values. We conclude by considering the number of SSDI and SSI beneficiaries captured in the HRS relative to statistics published by SSA. To align as closely as possible to published statistics, we made this comparison at two points in time, 2004 and 2010. Those years reflect the addition of new cohorts to the HRS (Early Baby Boomers and Middle Baby Boomers, respectively) so that the HRS sample is nationally representative of ages from 51 through FRA, which align with SSA statistics that span 50-FRA for SSDI and 50-64 for SSI. It is important to note that while the statistics are similar, differences in the age composition of the comparison as well as being measured at slightly different points in time means that our comparison is valid within an order of magnitude, but we would not expect complete alignment.

Table 4 shows that: (1) self-reports are lower than administrative values in 2004 and 2010, consistent with our earlier findings, (2) administrative reports are lower than SSA published statistics in both years, and (3) the magnitude of the discrepancy across sources is smaller in 2010 than 2004. In 2010, the HRS linked to administrative records identified just under 4.5 million SSDI beneficiaries, about 75 percent of the 5.8 million in SSA published statistics. In the same year, the difference between the HRS administrative and published statistics for SSI was about the same, with the 1.02 million SSI recipients identified based on HRS administrative records reflecting about 78 percent of the 1.31 recipients in SSA published statistics.

Table 4. *Comparison of SSDI and SSI Beneficiaries in the HRS to SSA Published Statistics*

	SSA published statistic[1]	HRS-SSA administrative	HRS self-reports
SSDI beneficiaries			
2004	4,247,536	3,603,152	3,103,867
2010	5,827,321	4,445,529	4,047,090
SSI beneficiaries			
2004	1,350,000	994,285	838,508
2010	1,307,000	1,022,837	1,019,542

[1] Published values for SSI beneficiaries reported by SSA in thousands.
Notes: SSA values include those ages 50 through FRA (SSDI) and 50 through 64 (SSI), while the HRS values include those who are 51 through FRA to align with the selection criteria used in this manuscript. HRS values are weighted to be nationally representative of the non-institutionalized population in the year based on HRS sampling weights, as described in the text.
Source: SSA published statistics are from Table 4 of the SSDI Annual Statistical report (https://www.ssa.gov/policy/docs/statcomps/di_asr/2019/sect01b.pdf) and the 2018 Annual Report of the SSI program (available at https://www.ssa.gov/oact/ssir/SSI18/IV_B_Recipients.html#1020383). HRS values are authors' calculations using the RAND-HRS and SSA data linkage.

There are several possible reasons for the observed differences. First, the HRS sample in these years is based on sampling weights that make the sample nationally representative of only the non-institutionalized population. Starting in 2014, the HRS weights better account for nursing home residence and no longer assign 0 weight to respondents living in an institution, but that was not true in 2004 or 2010, nor the cohort selection processes for the samples in those years. We could not find national statistics on the share of under-FRA beneficiaries residing in institutions, we did find that 4.6 percent of the (unweighted) respondents receiving SSDI in 2010 had a zero survey weight (implying residing in an institution), and 5.2 percent of those receiving SSI (not shown). Second, until 2016, the HRS only asked questions on SSDI and SSI to those who reported a health-related work limitation. Those who were not asked the questions are coded as not receiving benefits, yet we know from other work that about one-fifth of disability beneficiaries in the CPS did not respond affirmatively to the survey question asking whether they had a work-limiting health condition (Burkhauser et al. 2014). As a result, we expect that the HRS self-reports will be lower than the administratively linked values. Those two factors alone may explain the bulk of the observed gap between HRS reports and SSA published statistics. A third explanation is that while the HRS is nationally representative on a range of characteristics, it may not fully capture disability beneficiaries. Given that beneficiaries have significant health limitations, it may not be surprising that they may be less likely to participate in a long survey

like the HRS and that the weighting procedure used by the survey may not account for all their characteristics. Again though, we caution that we do not know the relative magnitude of these three factors.

Discussion

We began this project by seeking a definitive answer to whether researchers should use the HRS self-reported data or the administrative records. Our answer is perhaps an unsatisfactory "it depends." In many cases, the self-reported data may be accurate enough—if receipt of SSI is simply a control variable, the difference between 2 percent and 2.5 percent may not be important. Yet, if the research question involves the need for benefits status that aligns with administrative records, or if the project intends to use other information about denied or allowed applicants such as time to initial decision or reason for denial, the administrative records are almost certainly better.

Our findings show that among the 15 percent or so of respondents with some information indicating interactions with federal disability programs, about half of self-reported responses to questions about having ever applied to or currently receiving SSDI or SSI in the HRS do not align with the individual's administrative record maintained by SSA. In general, we found that it is more likely that respondents fail to report benefits they are receiving than reporting benefits they are not receiving. On net, we found that the overall prevalence rates of SSDI and SSI application and receipt when weighted to be nationally representative in the HRS are lower based on self-reports than based on the administrative data. This is generally true across HRS respondent ages and across cohorts in the HRS.

Despite level differences in the share of respondents reporting interactions with disability programs, the patterns of new applications and new receipt across ages and waves in the self-reported and administrative data look generally similar. In other words, the level differences that we observe when respondents first enter the survey appear to remain over future waves. This suggests that the introduction of early OASI benefits at age 62 likely does not exacerbate misreporting, nor did we find strong evidence that respondents were reporting SSDI when they meant SSI (the gap when looking at either SSDI or SSI looked about the same as when considering each program separately).

We do not fully understand the causes of misreporting. In some instances, it may be a mismatch between what is recorded in the administrative data and what is salient to an individual. An applicant may not know that he or she was considered for SSDI when applying for SSI or that the lack of a cash payment in the month does not mean beneficiary status has ended. Yet, as we describe in detail in the appendix primer, most of the reasons we might expect a mismatch between the data sources would result in an overstatement of self-reports relative to administrative records. We did find that misreports are non-random and differ across race, gender, income, employment history, and a number of health conditions and health behaviors.

We also found—as others have with older versions of the files—that consenting to the administrative linkage is non-random. We attempted to account for this using a simple IPW scheme that the HRS also uses for its other SSA linkages, though a more in-depth approach to reweighting, such as exactly matching participants on certain characteristics, may be warranted in other research contexts. More importantly though, researchers considering using the linked data should be able to use our analysis to take stock of the effects on sample size. The richness of the HRS questionnaire should not be understated, but for low-frequency events like disability benefit receipt, a small sample size made smaller by a less-than-full consenting to the linkage may make certain research studies intractable. Understanding the sample size loss may lead some to accept the loss of precision in the self-reports in order to preserve record count.

Another reason that researchers may avoid the administrative records is a very high barrier to entry. While the HRS has made strides in recent years to streamline and simplify the process necessary to access the linked data, the documentation to understand and link the files to the core survey remains complex and limited. Even with the addition of the DAF—which was designed to support research on disability programs by linking information contained in other files already accessible by HRS users—a detailed knowledge of SSA programs and program data is required to work with the linked data. We have attempted to fill some of that gap with this paper and the associated primer, but caution that the administrative records were not primarily designed to support research and utmost caution is required to avoid misinterpretation of the information they contain.

Because of the high barriers to entry, we suspect that self-reports will remain the dominant source of information on disability benefit receipt using the HRS. Despite the misalignment with the administrative records, there are several reasons that this may be

advantageous. First, the HRS is continually making improvements in the information it collects from respondents. For example, in 2016, the HRS began asking all respondents—not only those reporting a health-related work limitation—about their receipt of SSDI and SSI, recognizing that a share of beneficiaries would not report such limitations. Second, the HRS collects a large battery of information about disability onset that goes beyond program participation. For example, the survey asks respondents about the nature of their limitation, the timing of new onset, and about their own and their employer's responses to new health conditions. To the extent that self-reported information about program participation aligns with the respondent's recall about the other disability measures, self-reported data across the board may be preferable to combining information from other sources.

A third and final benefit of the self-reported information is that the RAND-HRS files take an incredibly complex question sequence with variability over the two decades of HRS data collection to produce a streamlined, quickly accessible set of measures related to participation in SSDI and SSI. The herculean effort that went into producing cross-wave consistent measures of program participation should not be understated, and we suspect that many studies of those measures would not have been conducted if researchers themselves had to develop those measures independently using the core HRS files. The HRS has significantly advanced the knowledge base related to older workers with new disabling conditions because of its rich, longitudinal data collection and care to preserve measures as much as possible over time to produce cross-wave consistency. The RAND-HRS files have built upon that notable data collection to make the information widely accessible by the research community. Without both components, we suspect that our understanding of disabilities among older workers would be substantially less robust.

Conclusion

In this paper, we sought to investigate differences in consenting to and reporting of SSI and SSDI application and receipt between self-reported and linked SSA administrative data in the HRS. We find that aggregate self-reported percentages of application and receipt of SSDI and SSI are lower than those reported in HRS-SSA administrative data at nearly all ages, but incidence rates are similar. Moreover, there are cohort differences in the rates of application and receipt of self-reports and administrative data on application and receipt of SSDI or SSI but no

consistent pattern in the difference between the two across the cohorts. Individual misreporting represents a minority of cases but is still common among those, and false negatives (i.e., reporting no application or receipt despite administrative records indicating otherwise) tend to be higher than false positives, especially at older ages. Characteristics among respondents who provide false self-reports as compared to their linked administrative data differ from those whose self-reports are concordant with administrative records. Those differences depend on the program and age of the respondents, but include race, income, assets, education, health conditions, and health behaviors.

Taken together, we find that both data sources can be useful for research pertaining to SSI and/or SSDI applicants or beneficiaries, depending on the research question at hand. Using HRS self-reported data is likely to result in an underestimate of program application and receipt relative to HRS-SSA data and descriptions of applicants or recipients' demographics, employment, income, and health may differ. As such, care should be taken in interpreting applicant or beneficiary characteristics when using self-reports. Still, use of linked data may not be feasible for some research purposes. In cases where a linkage may not be practical, the use of self-responses can still be informative in a number of research applications. These can include, and are not limited to, longitudinal analysis of employment or health characteristics in relation to SSA programs or the use of receipt or beneficiary status as covariates or controls in analysis.

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Appendix A. A Primer for Using Information in the *Health and Retirement Study* to Measure Experiences with Federal Disability Programs

The *Health and Retirement Study* (HRS) offers an opportunity to measure experiences with disability program interactions using individuals' self-reports as well as administrative data collected by the Social Security Administration (SSA). Because of the cross-wave consistent measures contained in the RAND-HRS, working with the self-reported data is relatively straightforward and these variables are commonly used in disability-related research using the HRS. The administrative data made available by SSA, however, may be more appropriate in some cases—for example, when looking at the reason for benefit allowance, the timing of benefit cessation, or when accurate benefit information is critical. Working with the administrative data poses additional hurdles, which may in part explain why the linked resource has been underutilized (Schimmel Hyde and Stapleton, 2017). Among these, understanding how to work with the administrative data, which are not designed for research and are not well-documented, may be most critical.

In this document, we offer a primer for developing measures of application to and receipt of Social Security Disability Insurance (SSDI) and Supplemental Security Income (SSI) based on the administrative data. We describe our approach to identifying (1) whether HRS respondents have ever applied for SSDI or SSI by the time of each HRS interview, and (2) whether they are receiving SSDI or SSI as of each interview. We do this using the SSA administrative linkage as well we the RAND version of the HRS. Researchers who are interested in using data from these sources may find this document a starting point for their own research, though we recognize that the decisions we made for our work might not apply in all circumstances. Each source of information has relative strengths and weaknesses; we hope these will become apparent in what follows.

Data Sources

We use four main sources of information in this document to measure application for and receipt of SSDI and SSI benefits:

1. **The RAND-HRS**, which contains cross-wave consistent information about SSI and SSDI benefits, derived from respondent self-reports in the HRS. For our analysis, we used the version of the file that contained data through 2018.

2. ***Form 831* Respondent Records**. This is an SSA administrative file available with permission to HRS users that contains information on most initial applications for SSDI and SSI from 1988 onward. As we describe below, the file is limited to applications that received a medical review. The version of the file we worked with to develop this primer contained applications through 2016.

3. ***Disability Analysis File* (DAF).** The DAF is an SSA file that combines data from multiple administrative sources to produce monthly information about the receipt of SSDI and SSI benefits starting in 1996. The version of the file we worked with to develop this primer contained information through 2018.[8]

4. **The HRS-SSA Permissions Consent History**. This file provides information in each HRS wave whether a respondent to the HRS consented to having their information linked to SSA records and whether a match with the data was found. This file is critical for knowing which respondents might have administrative records available.

Additionally, users who solely want to work with the administrative data may want to consult **the HRS-SSA Weights File,** which provides weights that may be used to account for nonresponse due to not consenting in order to construct a nationally representative sample. Depending on the specific analysis, researchers may want to use these weights or construct their own weights using a similar methodology.

[8] Instead of this file, a researcher could use the Cross-Year Benefits File (CYBF) and the SSI Respondent File that are available to HRS users. In theory, those files allow you to construct monthly measures of benefit receipt. We encountered significant difficulty in using the CYBF to identify months in which benefits were paid for SSDI versus Old Age and Survivors Insurance (OASI) benefits, which is a critical distinction between early and full retirement age. We document some of the challenges we encountered in working with those files in what follows.

HRS-SSA Permissions and the Implications for Sample Selection

A subset of respondents in the HRS have information available in each of the administrative records. Before beginning to work with the linked administrative records, it is critical to understand the availability of data across HRS respondents and time. Missing information in a particular linked file could be due to one of three reasons: (1) not having interactions with federal disability programs, (2) not consenting to have data linked to the SSA files, or (3) consenting to the linkage, but not providing data that allows for a successful match. Thus, it is critical to understand who gave permission in order to know whether their absence from a given administrative record reflects no program interaction or simply not having available data.

The process the HRS has used to ask its respondents to consent to having their data linked has changed over time. Before 2006, respondents provided consent through the survey year. In those years, if a respondent did not reconsent in a later year, data would only be available through the last year consent was given. Starting in 2006, the HRS instituted a prospective consent process that allowed data linkages into the future. These permissions are collected and updated as needed during face-to-face interviews that the HRS conducts periodically with respondents.[9] The duration of prospective permissions varies depending on the year the consent was collected and whether the consent was for earnings or benefits.[10]

The HRS documentation on permissions consent history provides additional information about the years in which respondents provided permission and the share of consenting records for whom matched earnings and benefits data is available.[11] Much of that documentation is limited to those with access to the restricted data, but publicly available documents contain a high-level overview that may be helpful before beginning work.

Based on correspondence with HRS staff, we learned that the DAF and 831 file were only available for HRS respondents who consented to the linkage in 2006 and later. As such, we

[9] About half of the HRS sample has a face-to-face interview in each wave. This means as a new cohort ages into the sample, it takes two waves for most of the sample to have had the opportunity to consent to the SSA linkage.
[10] Additionally, certain SSA files are only available if permission was obtained in 2006 and later; this applies to both the 831 and DAF that we used for our analysis. For this reason, we constructed our own consent weights that accounted for consent offered in 2006 or later, rather than the wave-specific weights provided by the HRS.
[11] Based on correspondence with HRS staff, the process SSA uses to match each administrative file may vary slightly and thus, there is not a consistent measure of whether the consenting record was matched. The consent file provided by the HRS contains a "match" flag for whether the record matched to the MBR. Because our analysis did not use that file, we did not use the match variable. Thus, the denominator of people who consented to the match is likely a slight overestimate relative to the number who had data available to complete the match.

use the consent file to determine the most recent consent year and limited our analysis to 2006 and later, reweighting following the procedure the HRS uses to reweight the SSA-matched sample to be nationally representative. Depending on the data files and waves of analysis, users may be able to follow a similar process.

Because missing records in the administrative file may be due to several sources, in what follows, we only define the affirmative value of each indicator. In other words, we define only whether the administrative data indicates that the person applied for or received benefits. We do not specify the lack of application or receipt. Users may do this differently, depending on how they want to include non-consenters in their analysis. Some may choose to set any HRS respondents to '0' who are not an applicant/beneficiary in the administrative records, while others may want to distinguish the reason for missing information (e.g., limiting to consenters but who were not in the administrative data).

DI and SSI Benefit Receipt

Though applications predate benefit receipt chronologically, we discuss our approach to constructing benefit receipt first. We do this because as we will show, there are reasons to think that applications may be undercounted for HRS respondents who receive benefits in the early years of the survey. As such, we use our measure of receipt to impute applications in some instances.

Measuring SSDI and SSI Benefit Receipt Using the RAND-HRS

To identify beneficiaries in each wave, we use information from the RAND-HRS RwDSTAT variable. The RwDSTAT variable indicates at each wave whether the person reports having a pending application for benefits or is receiving them, separately by program. We define two versions of SSI and SSDI beneficiary measures. The first definition is simply based on affirmative self-reports of "yes, I receive benefits from SSI" or "yes, I receive benefits from SSDI." This can include concurrent benefit receipt, where respondents report both SSDI and SSI receipt. These are defined directly from the information in the RAND-HRS, where the categories capture combinations of benefit receipt and pending applications across SSDI and SSI:

RwSSIBENSLF1=1 if RwDSTAT=2, 12, or 22

RwDIBENSLF1=1 if RwDSTAT=20, 21, or 22

The second definition accounts for the fact that respondents sometimes indicate that they know they are receiving benefits from SSA but are not sure from which program the benefits are being paid. This category is especially important before Wave 5, when the HRS did not distinguish benefits from the particular program. When possible, the HRS attempted to collect updated information from respondents after the survey changed, but that was not always possible. As such, the share of respondents with unknown benefit status is much higher through 2000 than it is in later waves. The second definition expands upon the analogous first definition by adding in another category that indicates benefit receipt from an unknown program:

RwSSIBENSLF2=1 if RwDSTAT=2, 12, 22, or 200

RwDIBENSLF2=1 if RwDSTAT=20, 21, 22, or 200

Measuring SSDI and SSI Receipt Using the SSA Administrative Linkage

We derive the receipt of SSDI and SSI benefits using the DAF, first linked to the HRS in early 2021. The DAF draws information from nearly one dozen SSA administrative datasets and provides information on SSDI and SSI receipt in a single file for all beneficiaries who have received benefits since 1996. The timing of the DAF means that the first two waves of the HRS do not have comparable administrative records.[12] Unlike other administrative sources, the DAF is designed to support research on beneficiaries and thus is relatively easier to work with than other administrative files on beneficiaries linked to the HRS.

We identify the receipt of benefits using the "STW" measure in DAF, which is a constructed measure designed to indicate whether beneficiaries did not receive benefits in a month because they were in suspense or termination status for work. Because the STW indicator identifies suspense and termination for various reasons, the remaining category indicates beneficiaries who were in current payment status in the month.[13] In general, current payment

[12] The DAF contains data back to 1994 for beneficiaries who received benefits from 1996 onward but does not contain complete information on all beneficiaries in 1994 or 1995.

[13] The DAF variables LAFyymm and PSTAyymm can also be used to determine current payment status, but an error in the version of the file we accessed meant that PSTA was excluded from the file. Users should consult future

status means that the beneficiary received a cash payment in the month, though STW can be updated retroactively.[14]

RwDIBENADM=1 if STWDIyymm=0 in the months of the HRS interview[15]
RwSSIBENADM=1 if STWSSIyymm=0 and PAYSyymm>0 in the months of the HRS interview

For SSI beneficiaries, we add a criterion beyond the STW measure for purposes of comparing to the self-report. Because program rules allow SSI recipients to be in current payment status but not receive a cash payment in the month (if their earnings or deemed income are too high), we also restrict SSI beneficiaries to those who received a positive payment in the interview month(s) (PAYS>0). We think the receipt of a cash payment may be most relevant to an HRS respondent when they report the receipt of benefits in the survey. Depending on the context of one's research, this additional restriction may not be necessary.

As an alternative to using the DAF, some users might want to measure benefit receipt using other administrative records linked to the HRS. For SSDI, researchers may consider the Respondent Cross-Year Benefit File (CYBF), which is a combination of SSA's Master Beneficiary Record (MBR) and the Payment History Update System (PHUS). The file contains information on receipt SSDI and Old Age and Survivors' Insurance (OASI), and it is important to identify the reason that benefits were paid. There are several measures that may be critical to users, though it is important to understand the caveats of each.

- DOEITOB and DOECTOB indicate the type of benefit, keyed to the earliest and most recent benefit spell, respectively. Using these measures, it is not possible to know if there were intervening benefit spells or the dates/benefits received on those spells. This could

documentation about the DAF linked to the HRS to identify whether these values may offer additional information beneficial to their research question.

[14] It is possible that an HRS respondent might report in an interview that received benefits, but the DAF record indicates they were in suspense status. Suspense and termination is relatively uncommon in the years just before full retirement age, so this is likely to not be a common issue among HRS respondents.

[15] Because HRS interviews can span more than one month and because we do not know precisely when benefits status is reported by beneficiaries during that time, we looked for benefits in the interview beginning and end months. Because few beneficiaries terminate from benefits, this is unlikely to substantially change the count of beneficiaries but errs on the side of counting respondents as beneficiaries if their status changes over that time.

be especially important as individuals move from SSDI to OASI, and as such, we did not consider these variables reliable for our purposes.

- TOC indicates the Type of Claim and is taken directly from the MBR. Up through May 2009, this value was overwritten with the most recent data. We were not able to identify a variable in the linked file that identified the date that aligns to TOC. After May 2009, multiple occurrences of TOC are recorded with corresponding TOCSTART dates (there were 5 such occurrences in the version of the file we worked with). While we tried to construct a series using the TOC values available, we were not able to do so in a way that we considered reliable enough for our purposes.

For SSI, researchers may consider the **Supplemental Security Income File**, which is a combination of SSA's Supplemental Security Record (SSR) and its SSI Longitudinal File. The SSI file contains monthly information back to 1974, when the SSI program started. Like working with the CYBF, it is important to identify whether SSI is being provided on the basis of disability or old age, or simply limiting SSI for disability to those under age 65. This can be done using the MFT and/or TOA variables in the file.

The SSI file is stored with one record per year of benefits, with a summary file indicating SSI spells. Beneficiaries can have multiple spells of SSI, either because they go on and off benefits, the basis for receiving benefits changes, or simply because their record is so long than SSA starts a new one (this has become less common as computing power has increased). It is important to link data from multiple years to get a complete picture of SSI benefits history. Yet, in the version of the linked file we worked with, we only found one record establishment date for each respondent in the file, which is not what we would expect given the likelihood of multiple SSI spells. As such, we suggest that users exercise caution when working with this file and consult the HRS with any questions about its contents.

SSDI and SSI Applications

Measuring SSDI and SSI Application Using the RAND-HRS

We used the disability spell data in the RAND-HRS to identify whether respondents had applied for benefits; the RwDSTAT variable indicates applications pending at the time of interview but may miss applications that are adjudicated between HRS survey waves. At each

interview, we compared the interview date (RwIWEND)[16] to the RADAPPx (application date for spell X) variables from RAND.[17] We looked for any spells that preceded the HRS interview date and identified if respondents reported applying to SSDI, SSI, both, or if they were unsure which program they applied for. Because we were only interested in having ever applied by a given HRS wave, we did not construct measures for multiple applications, though it is possible to do so with the information provided.

If any RADAPPx variable is before RwIWEND, we define a wave-specific measure of which program the respondent reports applying for. We create two versions based on a narrow and a broad definition, like what we did for benefit receipt to account for the uncertainty of the program to which the respondent reports applying. The narrow definition version includes applications in which the respondent indicated the program to which they applied. In addition, this version accounts for respondents who report receiving benefits, but for whom application data was not reported. The broad version builds off the narrow but incorporates uncertain responses about the program from which benefits were sought.

RwSSIAPPSLF1=1 if RADTYPE=2 for any RADAPPx < RwIWEND or RwSSIBENSLF1=1 for current wave or any earlier wave

RwSSIAPPSLF2=1 RwSSIAPPSLF1=1 or if RADTYPE= 3, 12, 13, 21, 23[18] for any RADAPPx < RwIWEND

RwDIAPPSLF1=1 if RADTYPE=1 for any RADAPPx < RwIWEND or RwDIBENSLF1=1 for current wave or any earlier wave

[16] Note that some HRS interviews span longer than a day, so there is a beginning and end date recorded. By taking the end date, we account for any applications that might have started during the interview "period," though we don't know when in the period the disability questions would have been asked. In most cases, this will not lead to differences in information collected from beneficiaries.

[17] The majority of respondents who report having applied for SSDI/SSI report 1 or 2 applications. In the RAND-HRS 2016 longitudinal file, 7,175 respondents reported at least one application. Of those, 5,017 reported only one application and 1,604 reported two applications.

[18] The category 3 indicates that the respondent reported applying for both SSDI and SSI, but also that they don't know to which program they applied. Nearly 40 percent of respondents are in this category. The categories of 12, 13, 21, and 23 are far less common, but indicate changes in responses over time; for example, a respondent initially reports in one wave that they applied for SSDI, but later says they applied for SSI.

RwDIAPPSLF2=1 if RwDIAPPSLF1=1 or if RADTYPE= 3, 12, 13, 21, 23 for any RADAPPx < RwIWEND)

As we mentioned at the start of the receipt section, we include as applicants those respondents who reported (with certainty) that they were receiving benefits from a given program. We believe it is possible based on the HRS sequence that a person receiving benefits could accurately report their benefits status but not provide complete information on their applications. This might be especially true for those who began receiving benefits well before they joined the HRS sample at age 51 or older.

Measuring SSDI and SSI Applications Using the SSA Administrative Linkage

Administrative information about application for SSDI and SSI benefits linked to the HRS comes from the *Form 831* file, which is the system that SSA uses to record the outcome of initial applications that receive a full medical review. The 831 file are structured with one row per application, separated by SSDI and SSI. For purposes of determining application status as of each HRS interview wave, we first identify application dates for each program:

SSIAPPDT=Combine FLD_Y, FLD_M and DAY=15[19] if RID=16
DIAPPDT=FLD_Y, FLD_MY, and DAY=15 if RID=2

With those defined, we then construct one-row-per-respondent record of applications using HHIDPN that incorporates all the SSI and SSDI application dates, so we can identify any applications filed before the HRS interview date:

RwSSIAPPADM=1 if (any SSIAPPDTx < RIWEND) or RwSSIBENADM=1 for current wave or any earlier wave
RwDIAPPADM=1 if (any SSDIAPPDTx < RIWEND) or RwDIBENADM=1 for current wave or any earlier wave

[19] To reduce disclosure risk, the files do not include the exact date of application. For simplicity, we assume the 15th of the month for purposes of constructing a single application date.

Like self-reports, we augment application data from the 831 file to incorporate beneficiary status and assume that if the administrative record identified the respondent as a beneficiary, they must have applied prior to that time. This would be true if the respondent applied for benefits prior to 1988, when the 831 file began.

It is important to understand the information that is—and is not—contained in the 831 file and implications for how the 831 records might relate to self-reports. The 831 file includes only the outcomes of applications that received a full medical review, which likely do not capture the full range of applications that respondents might report. *Form 831* records do not include:

- Applications that have not yet received an initial determination.
- Received a "technical denial." Technical denials occur when SSA determines that the applicant did not meet the financial eligibility criteria for benefits before considering their medical conditions. In the case of SSDI, this would mean not having sufficient quarters of coverage to be SSDI-insured. For SSI, this might mean income or assets that are too high. About one-third of applications receive a technical denial. In these instances, HRS respondents might report having applied for benefits, but there would be no record in the 831 file.
- Information about applications that are initially denied but subsequently appealed. For purposes of identifying whether a respondent has ever applied for benefits, this is not a problem, because the initial application is in the 831 file. As such, an HRS respondent could accurately report a pending claim that would not be in the 831 file. About half of applications are rejected at the initial or reconsideration levels, with many ultimately receiving an award. Using the 831 file, it is impossible to know which applications have been appealed.

There are also reasons why applicants might not know that they have an application that is recorded in the 831 file. For example, an individual who applies for SSI is automatically considered by SSA for SSDI as well, by checking the quarters of coverage the applicant has. Applicants to SSDI will be considered for SSI if they report having low income or assets. Yet,

respondents may not fully understand the distinction across programs and thus may not know that they had an application to a program other than the one from which they initially applied.

There is a measure in the 831 file, CCF, that indicates that a concurrent application was filed, meaning that the applicant initially sought both SSDI and SSI benefits. In many cases, applications marked with CCF in the 831 file have an application to the other program with the same filing date, meaning that the applicant met the criteria for both programs. There are other applications, however, in which the application is flagged as concurrent, but there is only one application from that date (e.g., a SSDI application is in the 831 file without an analogous SSI application). In those cases, the applicant applied for benefits from both programs, but for one of the programs, the application was denied before receiving a medical review (technical denial). Thus, using CCF would allow researchers to fill in additional information about some applications. Still missing are applications to only one program that were technically denied, as well as concurrent applications that were technically denied to both programs. Because we know that even with CCF, we do not know the full account of technical denials, we do not use CCF records in our analysis.

Appendix B. Supplementary Tables

Appendix Table B.1. *Interview and Consent Status of HRS Respondents by Cohort and Wave (Unweighted)*

	1992	1994	1996	1998	2000	2002	2004	2006	2008	2010	2014	2016
HRS (born 1936-1941)												
Interviewed	5,604	5,045	4,788	4,578	4,336	3,207	1,981	723	0	0	0	0
Never consented	670	508	439	394	346	248	139	40	0	0	0	0
Consented pre-2006	2,186	1,902	1,730	1,565	1,389	950	550	170	0	0	0	0
Consented 2006 or later	2,748	2,635	2,619	2,619	2,601	2,009	1,292	513	0	0	0	0
Not interviewed, not dead	0	487	645	760	877	750	513	269	0	0	0	0
Reached FRA	0	0	0	0	0	1,213	2,796	4,435	5,604	5,604	5,604	5,604
Dead (before FRA)	0	72	171	266	391	434	314	177	0	0	0	0
War Baby (born 1942-1947)												
Interviewed	0	0	0	3,090	2,834	2,752	2,634	2,526	2,141	1,290	569	0
Never consented	0	0	0	473	358	313	250	232	189	133	61	0
Consented pre-2006	0	0	0	656	571	528	472	381	285	146	55	0
Consented 2006 or later	0	0	0	1,961	1,905	1,911	1,912	1,913	1,667	1,011	453	0
Not interviewed, not dead	0	0	0	0	227	257	337	379	395	264	139	0
Reached FRA	0	0	0	0	0	0	0	0	322	1,365	2,290	3,090
Dead (before FRA)	0	0	0	0	29	81	119	185	232	171	92	0
Early Baby Boomers (born 1948-1953)												
Interviewed	0	0	0	0	0	0	3,369	3,019	2,892	2,803	2,683	2,394
Never consented	0	0	0	0	0	0	578	419	372	346	327	290
Consented pre-2006	0	0	0	0	0	0	449	349	265	225	190	155
Consented 2006 or later	0	0	0	0	0	0	2,342	2,251	2,255	2,232	2,166	1,949
Not interviewed, not dead	0	0	0	0	0	0	0	311	388	416	487	538
Reached FRA	0	0	0	0	0	0	0	0	0	0	0	162
Dead (before FRA)	0	0	0	0	0	0	0	39	89	150	199	275
Middle Baby Boomers (born 1954-1959)												
Interviewed	0	0	0	0	0	0	0	0	0	4,782	4,394	4,125
Never consented	0	0	0	0	0	0	0	0	0	1,019	834	761
Consented pre-2006	0	0	0	0	0	0	0	0	0	59	44	45
Consented 2006 or later	0	0	0	0	0	0	0	0	0	3,703	3,515	3,318
Not interviewed, not dead	0	0	0	0	0	0	0	0	0	0	333	537
Reached FRA	0	0	0	0	0	0	0	0	0	0	0	0
Dead (before FRA)	0	0	0	0	0	0	0	0	0	0	55	120

Source: Authors' calculations using the RAND-HRS and SSA data linkage.

Appendix Table B.2. *Comparison of Characteristics in the Full HRS Sample and Consenter Sample (Unweighted)*

	Full HRS sample	Consenter sample	p-value[1]
Demographic Characteristics			
Race (%)			
White	74.0	76.2	0.0002***
Black	18.3	16.4	
Other	7.7	7.4	
Ethnicity (%)			
Hispanic	12.1	11.7	0.4569
Non-Hispanic	87.9	88.3	
Gender (%)			
Male	41.0	38.4	<.0001***
Female	59.0	61.6	
Marital Status (%)			
Married	87.6	87.3	0.1655
Divorced	6.5	7.1	
Never married	5.9	5.6	
Education (years completed)	12.5	12.7	<.0001***
Socioeconomic characteristics and employment			
Respondent income ($)	24,352	25,490	0.0445*
Household income ($)	70,411	71,186	0.6509
Total household assets ($)	278,602	277,852	0.9315
Labor Force Status			
In labor force	68.0	71.9	<.0001***
Retired	17.8	15.6	
Disabled	5.3	4.3	
Not in labor force	8.9	8.2	
Years of tenure at current job	12.0	11.7	0.1058
Years at longest job	15.7	15.4	0.0277
Total years worked	26.9	26.8	0.4943
Health Characteristics			
Self-reported health (%)			
Excellent	16.8	18.1	<.0001***
Very good	30.6	32.1	
Good	28.9	28.5	
Fair	16.8	15.8	
Poor	6.9	5.5	
Health problems limit work	24.1	21.5	<.0001***
Doctor has ever diagnosed (%):			
High blood pressure	37.4	35.7	0.0066***
Diabetes	12.5	10.6	<.0001***
Cancer	6.1	5.6	0.0859
Lung disease	5.7	4.5	<.0001***
Heart disease	11.1	9.5	<.0001***
Stroke	3.2	2.5	0.0006***
Psychological problem	12.1	12.4	0.383
Arthritis	37.3	36.3	0.138

Total number of health conditions reported	1.3	1.2	<.0001***
Body mass index (above 30 indicates obesity)	28.2	28.4	0.0066***
CESD mental health score[2]	1.5	1.4	0.4454
Number of ADL difficulties[3]	0.213	0.179	0.0002***
Number of IADL difficulties[4]	0.17	0.138	<.0001***
Hospital stay in previous two years (%)	18.4	17.0	0.005*
Any doctor visit in previous two years (%)	89.9	90.4	0.2045
Number of doctor visits in previous two years	8.3	8.0	0.0912
Out-of-pocket medical expenditures ($)	2,248	2,165	0.3467
Self-reported probability of (%):			
Living to age 75	64.3	65.6	0.0023**
Working full-time after age 62	46.3	46.3	0.976
Working full-time after age 65	28.9	29.1	0.7075
Work-limiting health problem in next decade	38.8	38.3	0.4421
Health Behaviors			
Ever smoked (%)	59.2	57.4	0.0051
Smokes now (%)	23.2	21.8	0.0068**
Ever drank alcohol (%)	57.9	60.2	0.0002***
Number of days/week of drinks with alcohol	1.1	1.2	0.0199**
Number of drinks of alcohol per day	0.9	1.0	0.3868

[1] We used a t-test to compare the difference in means and a chi-square test to assess the difference in distributions. When we tested the distribution, the test statistic is shown for the category heading.
[2] Center for Epidemiological Studies Depression (CESD) is an 8-point battery measure depressive symptoms.
[3] Activities of Daily Living (ADLs) marked 0-5 to represent the number of ADLs in which the respondent reports at least some difficulty.
[4] Instrumental Activities of Daily Living (IADLs) are marked 0-5 to represent the number of IADLs in which the respondent reports at least some difficulty.
Notes: ***p<0.001; **p<0.01; *p<0.05. All values are taken at baseline (i.e., when the respondent was first observed in our sample), and all dollar values are inflated-adjusted to 2020 dollars.
Source: Authors' calculations using the RAND-HRS and SSA data linkage.

Appendix Table B.3. *Comparison of Characteristics of Respondents Who Correctly Report and Misreport Receipt of SSDI Benefits at Age 63-64 (Linked Respondents, Unweighted)*

	Correct Positive	False Positive	p-value[1]	Correct Negative	False Negative	p-value[1]
Demographic characteristics						
Race (%)						
White	72.8	63.2	0.0853	81.7	70.4	<.0001***
Black	22.0	29.9		12.7	22.4	
Other	5.3	6.9		5.6	7.2	
Ethnicity (%)						
Hispanic	7.3	14.6	0.0073**	10.4	15.2	0.0064**
Non-Hispanic	92.7	85.4		89.6	84.8	
Gender (%)						
Male	45.9	42.36	0.4484	41.5	45.3	0.1762
Female	54.1	57.6		58.5	54.7	
Marital Status (%)						
Married	70.7	60.8	0.1471	83.1	68.6	<.0001***
Divorced	23.6	30.4		13.1	25.8	
Never married	5.8	8.8		3.9	5.7	
Education (years completed)	12.0	11.2	0.0025**	13.0	11.6	<.0001***
Socioeconomic characteristics and employment						
Respondent income ($)	17,712	14,396	0.7157	41,328	17,279	0.0033**
Household income ($)	36,829	30,062	0.119	79,372	33,277	<.0001***
Total household assets ($)	234,448	215,537	0.749	546,320	182,006	<.0001***
Working for pay (%)	5.1	9.0	0.0791	55.1	7.8	<.0001***
Total years worked (mean)	29.1	25.1	0.0018**	35.6	31.6	<.0001***
Health characteristics and health behaviors						
Self-reported prob of a work-limiting health problem in next decade (%)	73.3	57.5	0.5538	44.6	52.5	0.4232
Health problems limit work (%)	93.9	89.4	0.0883	19.0	80.0	<.0001***
Ever had (%)						

High blood pressure	70.1	75.5	0.2044	50.9	63.7	<.0001***
Lung disease	22	23.6	0.6831	5.5	15.2	<.0001***
Psychological problem	42.1	38.9	0.4957	14.5	32.7	<.0001***
Number of health conditions ever reported	3.2	3.4	0.2904	1.7	2.8	<.0001***
Body mass index (above 30 indicates obesity)	31.2	31.5	0.71	28.5	31.1	<.0001***
CESD mental health score[2]	2.6	3.2	0.0083**	1.1	2.6	<.0001***
Hospital stay in previous two years (%)	40	45.1	0.275	17.0	39.6	<.0001***
Any doctor visit in previous two years (%)	96.8	93.1	0.0492	92.0	93.5	0.335
Out-of-pocket medical expenditures ($)	5,233	4,498	0.5759	2,865	3,913	0.0034**
Number of days/week of drinks with alcohol	0.6	0.6	0.9522	1.2	62.9	<.0001***
Number of drinks of alcohol per day	0.5	0.6	0.5099	0.8	0.5	0.0043**

[1] We used a t-test to compare the difference in means and a chi-square test to assess the difference in distributions. When we test the difference in distribution, the test statistic is shown in the category heading rather than for a particular variable.
[2] Center for Epidemiological Studies Depression (CESD) is an 8-point battery.
Notes: ***p<0.001; **p<0.01; *p<0.05. All values are taken at the ages 55 or 63, respectively, and all dollar values are inflated-adjusted to 2020 dollars. Results for all other age groups available upon request.
Source: Authors' calculations using the RAND-HRS and SSA data linkage.

Appendix Table B.4. *Comparison of Characteristics of Respondents Who Correctly Report and Misreport Receipt of SSDI Benefits at Age 63-64 (Linked Respondents, Unweighted)*

	Correct Positive	False Positive	p-value[1]	Correct Negative	False Negative	p-value[1]
Demographic characteristics						
Race (%)						
White	45.3	51.7	0.6005	81.3	53.4	<.0001***
Black	43.2	3500.0		13.3	38.6	
Other	11.6	13.3		5.5	8.0	
Ethnicity (%)	0.0	0.0				
Hispanic	22.1	21.7	0.9488	10.0	28.4	<.0001***
Non-Hispanic	77.9	78.3		90.0	71.6	
Gender (%)	0.0	0.0				
Male	24.2	33.3	0.2166	42.6	30.7	0.0251
Female	75.8	66.7		57.4	69.3	
Marital Status (%)	0.0	0.0				
Married	30.8	61.7	0.0041*	82.3	38.7	<.0001***
Divorced	46.2	31.9		13.9	46.8	
Never married	23.1	6.4		3.8	14.5	
Education (years completed)	10.1	11.3	0.0238*	13.0	9.1	<.0001***
Socioeconomic characteristics and employment						
Respondent income ($)	0	18,167	N/A	40,731	9,125	0.2118
Household Income ($)	11,486	28,336	<.0001***	75,058	12,775	<.0001***
Total Household assets ($)	39,800	256,063	0.1072	512,484	52,141	0.0025**
Working for pay (%)	0	5	0.0278**	49.8	3.4	<.0001***
Total years worked (mean)	15.5	21.9	0.009**	35.4	14.7	<.0001***
Health characteristics and behaviors						
Health problems limit work	84.0	98.2	0.0065**	26.4	74.7	<.0001***
Self-reported probability (%):						
Living to age 75	47.4	55.3	0.1948	65.7	44.6	<.0001***
Working full-time after age 65	3.0	0.4	0.1732	29.6	4.9	<.0001***

Ever had (%)						
High Blood Pressure	77.9	68.3	0.1875	52.7	69.3	0.0019**
Diabetes	39.0	38.3	0.9396	19.3	37.5	<.0001***
Lung disease	28.4	16.7	0.0957	7.1	13.6	0.0179*
Heart disease	39.4	38.3	0.8993	16.7	38.6	<.0001***
Stroke	22.1	15.0	0.2784	4.8	14.8	<.0001***
Number of health conditions ever reported	3.6	3.2	0.1722	1.8	3.2	<.0001***
Body mass index (above 30 indicates obesity)	32.0	29.4	0.0524	28.8	32.0	<.0001***
CESD mental health score[2]	3.5	3.4	0.8099	1.3	3.5	<.0001***
Number of ADL difficulties[3]	1.2	1.3	0.705	0.2	1.1	<.0001***
Hospital stay in previous two years (%)	44.2	36.7	0.3561	19.7	36.4	<.0001***
Any doctor visit in previous two years (%)	92.6	93.3	0.8694	92.4	92.1	0.8989
Number of doctor visits in previous two years (%)	17.3	18.9	0.7617	9.1	18.4	<.0001***
Out-of-pocket medical expenditures ($)	1,201	4,130	0.0034**	3,185	375	0.0004***
Ever drank alcohol (%)	23.2	50.0	0.0005***	55.3	25.0	<.0001***
Number of drinks of alcohol per day	0.4	1.0	0.0096**	0.8	0.5	0.0358

[1] We used a t-test to compare the difference in means and a chi-square test to assess the difference in distributions. When we test the difference in distribution, the test statistic is shown in the category heading rather than for a particular variable.
[2] Center for Epidemiological Studies Depression (CESD) is an 8-point battery.
[3] Activities of Daily Living (ADLs) marked 0-5 to represent the number of ADLs in which the respondent reports at least some difficulty.
Notes: ***p<0.001; **p<0.01; *p<0.05. All values are taken at the ages 55 or 63, respectively, and all dollar values are inflated-adjusted to 2020 dollars. Results for all other age groups available upon request.
Source: Authors' calculations using the RAND-HRS and SSA data linkage.

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