Subsequent Program Participation of Former Social Security Disability Insurance Beneficiaries and Supplemental Security Income Recipients Whose Eligibility Ceased Because of Medical Improvement

by Jeffrey Hemmeter and Michelle Stegman*

The Social Security Administration (SSA) periodically reviews the disabilities of Supplemental Security Income (SSI) recipients and Social Security Disability Insurance (DI) beneficiaries to determine if their impairments still meet the requirements for program eligibility. For individuals whose eligibility was ceased after a full medical review from 2003 to 2008, we track subsequent program participation for up to 8 years. We use survival analyses to estimate the time until first return to SSI and DI and explore the differences in returns by various personal and programmatic characteristics such as age, disability type, time on program, and SSA expectations regarding medical improvement. Overall, we estimate that about 30 percent of SSI-only recipients whose eligibility ceases because of medical improvement return to the SSI program within 8 years. For DI-only worker beneficiaries whose eligibility ceases, we estimate that 20 percent will return to the DI program within 8 years.

Introduction

Each year, the Social Security Administration (SSA) reviews the status of several hundred thousand Social Security Disability Insurance (DI) beneficiaries and Supplemental Security Income (SSI) recipients to determine if their medical conditions have improved enough since their last favorable determination of eligibility to allow them to engage in substantial gainful activity (SGA). To be eligible for the SSI disability program, an individual must have limited income and resources and be unable to engage in SGA because of a medically determinable physical or mental impairment that can be expected to result in death or last for at least 12 continuous months.[1] To qualify for DI, an individual must have a work history sufficient to attain insured status in addition to meeting the medical requirement.[2] At the time of award, or the last favorable review of eligibility, a date is set to revisit the individual's medical eligibility for continued participation. Because reviewing each case helps ensure that only eligible individuals receive payments, it is necessary for maintaining program integrity.

These periodic reviews, required by law, are called continuing disability reviews (CDRs). In order to keep the workload manageable and to limit administrative costs, SSA initiates the CDR process by using statistical models to identify individuals with characteristics indicating potential medical improvement. Based on those model results, SSA conducts a full medical review (FMR) only for cases deemed most likely to involve medical improvement. To individuals with a

Selected Abbreviations

CDR	continuing disability review
CIF	cumulative incidence function
DDS	Disability Determination Service
DI	Disability Insurance
FMR	full medical review

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Selected Abbreviations—*Continued*

SGA	substantial gainful activity
SSA	Social Security Administration
SSI	Supplemental Security Income

lower likelihood of medical improvement, SSA sends a "mailer" asking for more information to help determine if a FMR is necessary.

During a FMR, SSA and the state Disability Determination Service (DDS) collect medical information about the participant and determine whether evidence of medical improvement exists. If the individual's condition has improved since the most recent favorable decision such that he or she is able to engage in SGA, program eligibility ceases; if not, the individual continues to receive DI benefits or SSI payments and a date is set for a future review.[3] CDRs are estimated to be highly cost effective, saving approximately $9.30 for every dollar spent on them (SSA 2012b).[4] For that reason, the 2011 deficit-reduction plan exempted CDR allocations from congressional spending caps, and the Obama administration requested an increase in CDR funding in the 2012 budget.[5]

The focus on program integrity comes at a time of substantial increases in SSI and DI participation. From 1990 through 2011, the numbers of DI beneficiaries grew from about 3.0 million to 8.6 million and disabled SSI recipients increased from 3.3 million to 6.9 million (SSA 2012c, 2012d, 2012f). Although much of the increase is simply due to the aging and growth of the population, some have argued that the programs have become relatively more attractive to low-wage individuals and those with moderate disabilities, especially during economic downturns (for example, Autor and Duggan 2003, 2006; Black, Daniel, and Sanders 2002; and Rupp and Stapleton 1998). Additionally, there is some evidence that states have transferred some of the costs formerly borne under Temporary Assistance for Needy Families onto the federal SSI program (Burkhauser and Daly 2011; Schmidt and Sevak 2004; Kubik 1999, 2003; Wamhoff and Wiseman 2005/2006). The 1990 *Sullivan v. Zebley* Supreme Court decision greatly expanded SSI eligibility for children, although welfare reform in the mid-1990s required SSA to review cases allowed during that period. Regardless, the SSI child population grew substantially in the 1990s, and many recipients continue receiving SSI as adults. In light of the increasing program costs associated with increasing participation, it is important for SSA to ensure that only those truly eligible for DI and SSI remain in the programs.

Although a few studies have looked at DI beneficiaries who medically recover (for example, Hennessey and Dykacz 1993; Dykacz and Hennessey 1989; Treitel 1979; and Schmulowitz 1973), we have not found similar studies of SSI recipients.[6] The DI studies have focused on earnings of former beneficiaries rather than subsequent program participation after a cessation decision. A few studies that look at subsequent return (Hennessey and Dykacz 1993; Dykacz and Hennessey 1989; Dykacz 1998) do not differentiate between medical and SGA-based recovery.[7]

Understanding what happens to individuals after their eligibility ceases because of medical improvement is important given recent calls across the government for stronger program integrity. Additionally, although actuaries from SSA and the Centers for Medicare and Medicaid Services incorporate returns in their models of the savings derived from CDRs, it is important for policymakers to better understand the impact of CDRs on program participation patterns.

In this article, we provide new information on the experiences of DI beneficiaries and SSI recipients after receiving a FMR that resulted in eligibility cessation. Specifically, we look at subsequent DI and SSI participation of former DI beneficiaries and former SSI recipients. Although this study does not address whether SSA's current CDR policy is adequate or how well the social safety net is working in general, we provide descriptive information on formerly eligible participants and highlight which subgroups are most likely to return to program participation.

CDR Process

The date for which a CDR is scheduled is called the CDR diary date. That date is set during the last favorable decision, which in many cases is the time of award. SSA categorizes diaries into one of three groups according to the individual's prospects for medical improvement, and the diary type determines the timing of the scheduled CDR. If medical improvement is expected, the diary date is within 3 years of the last favorable decision. For cases in which SSA deems medical improvement possible, a CDR is scheduled for 3 years after the last favorable decision. If medical improvement is not expected, a CDR is scheduled for 5 to 7 years after the last favorable decision. When the diary date approaches, SSA either "directly releases" the individual for a FMR or sends

the individual a mailer containing a questionnaire seeking information to determine whether a FMR is necessary.[8]

To help determine who is directly released for a FMR and who receives a mailer, SSA uses a CDR profiling model based on administrative information to "score" the likelihood of medical improvement. SSA groups the results into three categories of likelihood of medical improvement—high, medium, or low—using cutoff scores that have not changed over time. Generally, high-scoring individuals undergo a FMR, and medium- or low-scoring DI beneficiaries and adult SSI recipients receive a mailer. However, as limited funding in recent years has restricted resources and experienced staff, SSA and the DDSs have further prioritized FMRs. As a result, some individuals do not receive their scheduled review until years later.[9]

If a mailer recipient's responses indicate medical improvement, SSA releases the case for a FMR;[10] otherwise, the agency simply sets a new CDR diary date. For a FMR, the DDS gathers medical information from the individual's medical care sources or orders consultative examinations from the treatment provider or other physicians.[11] A disability examiner and medical expert then determine if the individual's condition has improved since the last favorable decision to such an extent that he or she can perform SGA. If there has been no improvement, the individual is "continued" on the program and the DDS examiner sets a date for the next CDR. If the individual has medically improved enough to perform SGA, the examiner makes a "cessation" decision, which the individual may appeal.[12] Benefits stop after a 3-month grace period (the month of the decision and the following 2 months) unless the beneficiary appeals the decision and requests continuation of benefits during the appeal.[13] In fiscal year 2010, over 90 percent of initial CDR decisions for DI disabled-worker beneficiaries and SSI adult recipients were continuations (SSA 2012b).

The process described above has changed over time. One important example is that, as SSA moved toward statistical profiling, the agency started conducting FMRs for a sample of cases—a "profile sample"— that would not otherwise have received one. FMRs for the profile sample must be completed each year to validate the profiling model. We do not use the profile sample in our estimates because of the varying procedures under which they were drawn over the period we analyze.

Data Sources and Methodology

In this study, we use data from Social Security administrative records. The primary source is SSA's CDR Waterfall file, which contains information on all centrally initiated FMRs with a DDS determination.[14] We used an extract of the CDR Waterfall file covering calendar years 2003 through 2008.[15] That period includes FMRs conducted after the funding dedicated to processing CDRs was reduced. The file does not contain records for individuals who received a mailer unless their responses indicated possible medical improvement, in which case they went on to receive a FMR (subject to agency resources).

The file contains the date and result of the initial FMR decision by the DDS as well as the final appellate decision at the time the file was extracted. We use those data to identify records for which the FMR led to a final cessation and to define the year of the initial decision. We also use that file to create several variables likely to be correlated with return to program participation:

- CDR diary type (medical improvement expected, not expected, or possible);
- CDR profile score (high, medium, or low);
- whether the individual received a mailer or was directly released for a FMR;
- whether the individual had a prior CDR;
- whether a consultative examination was requested during the FMR;
- the adjudicative level of the decision under which the individual first entered the DI or SSI program (initial, reconsideration, Administrative Law Judge or higher, or unknown); and
- the disability considered to be the primary impairment prior to the FMR.

In addition, the file contains the date the individual became eligible for DI or SSI, the date of birth (used to establish age at the time of the initial decision[16]), sex, race, and state of residence, which may also be correlated with return to the program. For individuals receiving both SSI and DI, we use the eligibility date and adjudicative level of whichever program they entered first.

We merged the CDR Waterfall file with SSA's Numident file to obtain dates of death. If a record was missing the date of birth, we used the Supplemental Security Record and the Master Beneficiary Record

(program databases covering applicants and beneficiaries for SSI and DI) to obtain it.

We also merged those files with SSA's Master Earnings File to create a measure of preeligibility earnings. We use the average earnings in the 5 years preceding the individual's date of eligibility to derive that measure. In our analyses, we include the program-specific earnings quartile of our target population. For example, we use the earnings of DI-only disabled-worker beneficiaries to define the quartiles for that group. For SSI-only recipients, we combine the two lowest quartiles because their median earnings are very close to $0.

To determine if an individual returned to DI or SSI, we merged the data described above with SSA's Disability Research File. We used that file to identify the date of the first successful postcessation application. A successful application is determined by whether benefits are awarded; postallowance technical denials are omitted. We are able to follow individuals in all of those data files through 2010.

Target Populations

All three of the target populations in this article consist of adults aged 18–59 who participated in disability programs administered by SSA until their eligibility ceased because of a FMR finding of medical improvement. The groups comprise former DI-only disabled-worker beneficiaries (individuals who did not also receive SSI payments, hereafter called "DI-only workers"), former SSI-only recipients (individuals who did not also receive DI benefits), and former disabled-worker concurrent beneficiaries (individuals who received both DI benefits and SSI payments, hereafter called "concurrent workers"). The FMRs that produced the cessation decisions were conducted during 2003–2008.

We restricted the target populations for various reasons. We removed individuals belonging to the profile sample, as well as those for whom a FMR determined reeligibility during a period of expedited reinstatement.[17] We removed records with missing or inconsistent dates, such as those indicating that an individual died before becoming eligible. We also removed individuals who appealed a cessation decision and were awaiting a new decision or still had time to file an appeal between their last cessation decision and the date the file was created. Because we focus on subsequent program participation, we excluded individuals whose eligibility did not cease. We observed the members of our sample through age 62 (as discussed below in the Analytical Methods section). Therefore, we omitted individuals who reached age 60 before their initial FMR decision and those who turned 62 before their final FMR decision in order to ensure adequate followup time.[18] We also excluded DI beneficiaries and SSI recipients who died before the final FMR decision or whose CDR profile score was missing. Those exclusions leave target populations of 33,376 DI-only workers, 24,514 SSI-only recipients, and 17,742 concurrent workers.[19] Appendix Table A-1 presents the number of records eliminated in each step of the selection process.

Limitations

SSA's CDR process is complex and dynamic. When considering our results, the reader should remember that our primary analysis pools data for several years under varying CDR policies. For example, different types of participants may have been targeted in certain years because of perceived cost savings or changes in the profiling model. Moreover, other SSA policies can also affect a CDR decision, complicating the definitional boundaries of our target populations. For example, Section 301 of the Social Security Disability Amendments of 1980 (Public Law 96-265) allows individuals to continue receiving payments even if they have received a cessation decision as long as they participate in an approved vocational program and make progress toward their employment goals. Because our observation period for each individual begins with the date of the FMR decision, the outcomes for former participants in our target population who use the Section 301 provisions and those who do not might differ. We cannot identify Section 301 use in our data (however, usage is generally low).

Our estimates also cannot anticipate future changes in funding for CDRs, the stringency of the reviews and the eligibility requirements, and the extent to which SSA uses its profiling model. The interaction of those and other factors could lead, for example, to an increase in the number of FMRs conducted. However, depending on the underlying causes and other circumstances, an increase in CDRs could result in program returns that differ in either direction from our estimates.

Analytical Methods

In this section, we discuss the cumulative incidence functions (CIFs) and proportional hazard regressions used in our analysis. We also address collinearity issues.

Cumulative Incidence Functions (CIFs)

Our primary goal is to estimate, among DI beneficiaries and SSI recipients whose eligibility ceased because of medical improvement, the percentage who subsequently returned to either the same program or the opposite program. If returning to the program was the only possible outcome and we observed all individuals over a consistent period, we would simply divide the number of individuals who returned by the number of people whose eligibility ceased. Unfortunately, neither of those conditions holds. Our observation periods range from 2 years to 8 years, depending on the year of the individual's FMR. Additionally, certain life events will compete with that outcome in other ways; death, for example, obviously precludes program return. Also, disability is no longer a factor in the SSI eligibility determination once an individual reaches age 65, and after a person reaches full retirement age (between 65 and 67 years, depending on year of birth), disability no longer affects Social Security benefit eligibility. Accurate estimates of program return must account for such factors.

To address those issues, we compute CIFs measuring the cumulative percentage of individuals from each target population who return to DI or SSI after the final cessation decision. CIFs estimate the probability of an event (such as returning to the program) when competing risks exist (Gooley and others 1999). For our analysis, we treat attainment of age 62 (which we refer to as early retirement or, simply, retirement) and death as competing events or risks.[20] Once individuals attain age 62 or die, they are no longer at risk of returning and thus provide no information about the probability of program return. Without controlling for those competing events, our estimates would assume such individuals could still return later, artificially decreasing estimated returns. Dropping the individuals who experience those events from our analysis would similarly bias our results. Thus, we estimate the probability that an individual returns to the program, allowing for the risk of dying or reaching age 62 by the end of our follow-up period (December 31, 2010). Our measure of time covers the period from the date of the final FMR decision to the first of those events.

Marubini and Valsecchi (1995) show that the CIFs can be estimated by

$$\hat{I}_j(t) = \sum_{k|t_k \le t} \hat{S}(t_k) \frac{d_{jk}}{n_k}$$

where j represents the event of interest (return to the program), $\hat{S}(t_k)$ is the overall Kaplan-Meier survival function (that is, an estimate of the probability of neither returning, dying, nor reaching age 62 by time t_k), d_{jk} is the number of individuals returning at time t_k, and n_k is the count of those at risk of returning at time t_k. Thus, it is the sum of the products of the survival estimate at time t_k and the hazard at time t_k of event j, $(\frac{d_{jk}}{n_k})$.

As described above, we are able to track program return, death, and early retirement through December 31, 2010 (the censoring date); however, we present only the results for program return. We estimate the CIFs in monthly increments and the maximum observable time span in our data is 96 months, or 8 years.[21,22]

Regressions

Because the CIF does not control for other variables that may affect return to the program, we ran Cox proportional hazard regressions on the hazard of successfully reapplying to the program to control for the characteristics of our population. Like other types of regression (such as ordinary least squares), Cox regressions provide estimates of the relative contribution of the covariates to the outcome, which in this case is the risk (or "hazard") of returning to the program over a given period of time. The exponentiated coefficients from this regression are known as hazard ratios and are interpreted similarly to odds ratios from logistic regressions: Hazard ratios greater than 1 indicate a higher risk of return relative to the reference group and those less than 1 indicate a lower risk.

The time dimension is one of the primary differences between Cox regressions and static regressions: Cox regressions estimate whether an event occurs, controlling for the timing of the event. As with the CIFs, Cox regressions control for the diverse followup times within the sample. Individuals no longer at risk of returning to the program are censored and thus drop from subsequent periods in the analysis. Unlike the CIFs, though, competing events do not hinder our ability to estimate the risk of return; that is, we can estimate the risk of return by treating competing events (death and early retirement age) as censored at the time they occur.[23]

In all our empirical models, we stratify our analyses by year of initial FMR determination, state of residence, sex, and race, allowing for separate baseline hazard functions for groups identified by those characteristics but constraining the coefficients (and hazard ratios) to be equal.[24] We do so because the different CDR policies, funding, and resources, and the variation in state policies and economies, likely affect the baseline hazard of return in each state and year in

different ways. Stratification allows the effect of the other covariates in our empirical model to be proportional to the differing baseline hazards. Although this method eliminates our ability to estimate hazard ratios for the stratification variables, it also helps satisfy the proportionality assumption discussed in the following paragraph. However, future work may further consider the distributional aspects of program return.

The Cox regressions rely on the proportionality between the hazard and each covariate being constant over time. Grambsch and Therneau (1994) suggested a test of the proportionality assumption using scaled Schoenfeld residuals.[25] Those residuals (essentially the covariate value for a person actually experiencing an event minus the expected value of the event) are independent of time if the proportionality assumption is satisfied. After running that test on our empirical models, we determined that our data do not satisfy the proportionality assumption for the DI-only and concurrent worker models. For the empirical model of return to DI by former DI-only workers, the problematic variables were CDR profile score, history of a prior CDR, and preeligibility earnings quartile. In addition to those variables, the age variables did not satisfy the proportional hazards assumption in the empirical model of the return to DI by concurrent workers. For the empirical model of former DI-only workers entering SSI, the problematic variables were CDR profile score, history of a prior CDR, and mailer-recipient status. For the empirical model of concurrent workers returning to SSI, the problematic variables were history of a prior CDR and diary type.

For the problematic variables, we allow the hazard ratios to take on different values at different times. To minimize the effect of imposing a functional form on the relationship with time and to keep the empirical models computationally feasible, we allow each of the variables to have different hazard ratios for each year of followup, combining the seventh and eighth years because of small cell sizes. For example, we include a separate hazard ratio to capture the effect of a high CDR profile score in the first year after the FMR, the second year after the FMR, and so on up to 7+ years after the FMR.[26] The resulting general empirical model is:

$$h_i(t) = h_{0i}(\mathrm{t})\exp\left(\sum_{s=1}^{S}\beta_s x_s + \sum_{m=1}^{7}\gamma_m z_m\right)$$

where $h_i(t)$ is the hazard for stratification group i at time t, $h_{0i}(t)$ is the baseline hazard,[27] the β_s are the coefficients, and the x_s are the main variables. The last term on the right-hand side of the equation captures the time-varying effects, where γ_m is the effect of variable z_m m years after the FMR (and is not included in the SSI-only empirical model). In the estimation, the coefficients (β_s and γ_m) are constrained to be equal across stratification groups. All empirical models use the Efron method for treating tied events.[28]

Multicollinearity

Because of the number and the nature of the variables in our models, our estimates may suffer from multicollinearity, causing individual hazard ratios to become difficult to interpret and standard errors to be inflated. However, excluding problem variables could lead to omitted-variables bias, also causing difficult-to-interpret hazard ratios.

We tested for multicollinearity by first looking for high correlation coefficients between our variables, but did not find any we deemed especially problematic (that is, greater than 0.30). We also formally tested for multicollinearity by estimating the variance inflation factor for each variable, which is $1/(1\text{-}R^2)$ where the R^2 comes from a regression using each independent variable as the dependent variable. Because multicollinearity applies to the independent variables, functional form is irrelevant. Variance inflation factors above 10 signify multicollinearity issues. Very few variance inflation factors exceeded 4, and only one was above 10. The problematic variables were CDR profile score and years in the program. Many of our variables are included in the model estimating the CDR profile score, so its status as potentially problematic is not surprising. We also ran separate regressions subsetting on each value of our independent variables; and although hazard ratios differ across regressions, and levels of significance vary, we did not discern any consistent patterns. Additionally, there are large differences in population when we subset by those variables, which may also affect statistical significance.

Given the lack of clear evidence for multicollinearity from the variance inflation factor, low correlation coefficients, and results from subgroup-specific regressions, we do not exclude any variables from our Cox regressions or present subgroup-specific regressions. We generally focus on the direction of the hazard ratios, not their magnitudes. Thus, our regressions should be viewed as primarily exploratory or descriptive in nature, suggesting groups to focus on more closely in future research.

Characteristics of the Formerly Eligible Population

Table 1 shows demographic and programmatic characteristics of our target populations of former DI-only workers, SSI-only recipients, and concurrent workers. It covers all cases in which eligibility cessation was the outcome of a FMR conducted during calendar years 2003–2008 and for which potential appeals have expired or been exhausted. The majority (74 percent) of formerly eligible DI-only workers are aged 30–49 (with 31 percent aged 30–39 and 43 percent aged 40–49). Former SSI-only recipients are somewhat younger, with 36 percent younger than 30 and another 28 percent aged 30–39. The age distribution of concurrent workers falls somewhere in the middle, with two-thirds between ages 30 and 49 and one-quarter who are younger than 30.

The most common impairments among former DI-only workers are certain mental disorders (combined and categorized under "other mental disorders") and musculoskeletal system diseases (30 percent and 16 percent of the target population, respectively). Among former SSI-only recipients, we see the largest proportions in the other mental disorders (35 percent) and intellectual disabilities (20 percent) categories. Nearly 40 percent of former concurrent workers have other mental disorders, far outnumbering individuals in any other diagnosis category. Those impairments are similarly the most common among DI disabled-worker beneficiaries and SSI adult recipient populations overall (SSA 2012a, 2012b).

The most common diary type in each of the target populations is possible medical improvement, with 68 percent of former DI-only workers, 80 percent of former SSI-only recipients, and 65 percent of former concurrent workers. Those expected to medically improve comprise the next largest share of each target population, with 28 percent of the DI-only group, 14 percent of the SSI-only group, and 33 percent of the concurrent group. Very few individuals are not expected to medically improve. This is not surprising because those judged least likely to medically recover would generally not receive a FMR, thus excluding them from our target population.

Pluralities of former DI-only and concurrent workers (both more than 41 percent) and a majority of former SSI-only recipients (71 percent) had been program participants for 6 years or longer; another one-quarter of

Table 1.
Descriptive characteristics of former DI-only workers, SSI-only recipients, and concurrent workers whose FMRs resulted in eligibility cessation during 2003–2008

	DI-only workers		SSI-only recipients		Concurrent workers	
Characteristic	Number	Percent	Number	Percent	Number	Percent
Total	33,376	100.00	24,514	100.0	17,742	100.0
Diary type (prospective medical improvement)						
Not expected	1,226	3.7	1,468	6.0	506	2.9
Possible	22,718	68.1	19,643	80.1	11,457	64.6
Expected	9,432	28.3	3,403	13.9	5,779	32.6
CDR profile score						
Low	2,874	8.6	1,298	5.3	747	4.2
Medium	4,845	14.5	3,835	15.6	3,289	18.5
High	25,657	76.9	19,381	79.1	13,706	77.3
Age at initial CDR decision						
Younger than 30	2,926	8.8	8,729	35.6	4,442	25.0
30–39	10,189	30.5	6,920	28.2	6,057	34.1
40–49	14,348	43.0	6,787	27.7	5,718	32.2
50–59	5,913	17.7	2,078	8.5	1,525	8.6
Years in program						
Fewer than 2	974	2.9	. . .	. . .	930	5.2
2–3	9,045	27.1	. . .	. . .	4,863	27.4
Fewer than 4 (SSI only)	. . .	. . .	2,304	9.4	. . .	. . .
4–5	9,376	28.1	4,733	19.3	4,603	25.9
6 or more	13,981	41.9	17,477	71.3	7,346	41.4

(Continued)

Table 1.
Descriptive characteristics of former DI-only workers, SSI-only recipients, and concurrent workers whose FMRs resulted in eligibility cessation during 2003–2008—*Continued*

Characteristic	DI-only workers		SSI-only recipients		Concurrent workers	
	Number	Percent	Number	Percent	Number	Percent
Diagnosis						
Neoplasms	3,586	10.7	732	3.0	1,065	6.0
Intellectual disabilities	456	1.4	4,805	19.6	993	5.6
Schizophrenia and other psychotic disorders	1,984	5.9	2,381	9.7	1,711	9.6
Other mental disorders	9,916	29.7	8,603	35.1	6,976	39.3
Diseases of the—						
Endocrine, nutritional, and metabolic system	599	1.8	603	2.5	301	1.7
Nervous system and sense organs	1,852	5.6	1,378	5.6	1,026	5.8
Circulatory system	1,437	4.3	453	1.9	625	3.5
Respiratory system	531	1.6	503	2.1	302	1.7
Digestive system	1,574	4.7	381	1.6	484	2.7
Genitourinary system	1,823	5.5	540	2.2	507	2.9
Musculoskeletal system and connective tissue	5,158	15.5	1,220	5.0	1,744	9.8
Injuries	3,117	9.3	848	3.5	1,392	7.9
Other	683	2.1	413	1.7	348	2.0
Unknown [a]	660	2.0	1,654	6.8	268	1.5
Mailer receipt status						
No (direct release to FMR)	23,701	71.0	17,506	71.4	14,724	83.0
Yes	9,675	29.0	7,008	28.6	3,018	17.0
Adjudication level of initial program entry						
Initial application	720	2.2	3,683	15.0	544	3.1
Reconsideration	21,921	65.7	16,913	69.0	11,652	65.7
Administrative Law Judge or higher	3,450	10.3	2,040	8.3	2,068	11.7
Unknown	7,285	21.8	1,878	7.7	3,478	19.6
Prior CDR status						
No	26,233	78.6	18,607	75.9	13,617	76.8
Yes	7,143	21.4	5,907	24.1	4,125	23.3
Consultative examination request status						
No	19,209	57.6	12,142	49.5	9,393	52.9
Yes	14,167	42.5	12,372	50.5	8,349	47.1
Age at initial program entry (SSI only)						
Younger than 18	. . .	. . .	6,991	28.5	. . .	. . .
18 or older	. . .	. . .	17,523	71.5	. . .	. . .
Calendar year of FMR						
2003	7,582	22.7	9,888	40.3	4,022	22.7
2004	7,640	22.9	8,110	33.1	4,076	23.0
2005	8,066	24.2	4,295	17.5	4,162	23.5
2006	4,782	14.3	1,130	4.6	2,677	15.1
2007	3,084	9.2	678	2.8	1,752	9.9
2008	2,222	6.7	413	1.7	1,053	5.9

SOURCE: Authors' calculations using Social Security administrative records.

NOTES: Rounded components of percentage distributions do not necessarily sum to 100.

. . . = not applicable.

a. Impairment type missing from CDR Waterfall data file.

DI-only and concurrent workers had participated for 4 to 5 years. Those large shares may result from a decline in CDR funding and a growing backlog of cases. We note that over three-quarters of each target population did not have a CDR prior to the current one, and over 60 percent have had medical improvement deemed possible (meaning a CDR scheduled every 3 years).

About 70 percent of DI-only and concurrent workers and 90 percent of SSI-only recipients had their FMR during the first half of our study period (2003–2005). The decline in FMRs in the latter half of the period is most likely due to a decrease in the number of cases sent for review because of lower funding. Year-to-year differences in the percentage of FMRs may also be related to changing CDR policies in SSA. Appendix Tables B-1 through B-3 report statistics for each target population in the first (2003) and last (2008) FMR years we analyze.[29]

Return to DI and SSI

In this section, we present estimates of the return to DI and SSI within 8 years of a final cessation decision. We begin with the estimates of the CIFs for the full target populations and follow with estimates for subsetting characteristics. We then turn to the regression results, focusing separately on each target population's return to DI and SSI.

CIF Results

We estimate the CIFs of return to DI and SSI for each beneficiary type, that is, the probability that a former participant successfully applies for DI or SSI by a given month. As stated earlier, we follow individuals until they successfully reapply for SSI or DI (depending on the empirical model), they attain age 62, they die, or December 31, 2010, whichever occurred first.[30] We present estimates of program return to DI in Chart 1 and to SSI in Chart 2.

Recall that we are measuring the time from the final FMR cessation decision to the application that leads to a new award. Given the large volume of appeals and the SSA backlog, it likely takes several more months until the first payment is received by those who return. However, in most circumstances, back payments will cover the time from favorable eligibility determination to first payment.

We estimate that about 20 percent of our DI-only target population and 21 percent of concurrent workers will return to DI within 8 years of an eligibility cessation due to medical improvement (Chart 1). More than one-half of those returns occur within the first few years of the FMR—at 3 years, roughly 11 percent of each group had returned.

A much smaller percentage of the SSI-only group successfully applies for DI after their SSI eligibility ceases (6 percent). Former SSI-only recipients must establish a sufficient work history to become eligible for DI. We cannot determine how many quarters of coverage those individuals had prior to entering SSI; some may only have needed a few quarters while others may have needed many. However, former SSI-only recipients with higher preparticipation earnings are more likely to subsequently enter DI than those with lower preparticipation earnings.

We estimate that almost 30 percent of the SSI-only group will return to SSI within 8 years of a final eligibility cessation (Chart 2). Unsurprisingly, concurrent workers return to SSI at about the same rate as they return to DI (22 percent). We estimate that 11 percent of former DI-only workers will successfully apply for SSI payments within 8 years.[31]

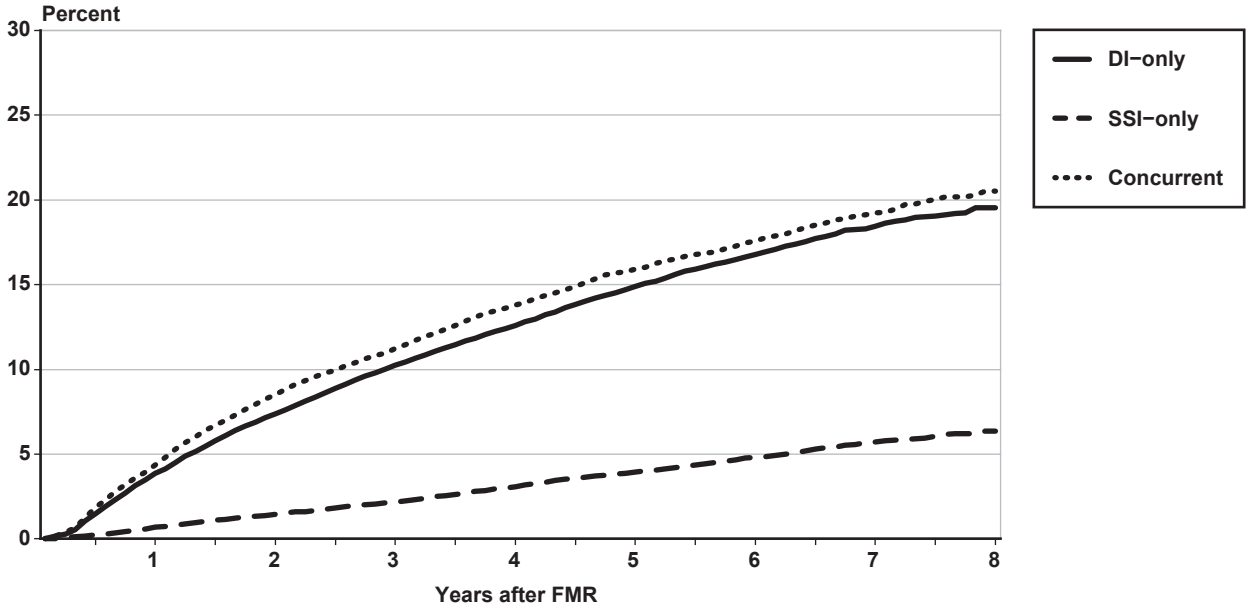
Note that the estimated CIFs at year 8 reflect the experiences of the earliest FMRs in our target population. However, the greatest risk of return, measured by the slope of the CIF, is in the first few years after the FMR. Although CIFs increase over time, they do so at diminishing rates.[32]

CIFs by Subsetting Characteristics

Table 2 presents the estimated cumulative incidence of successfully applying for DI or SSI within 8 years of cessation for each target population by characteristic. The first line replicates the final values of the overall CIFs in Charts 1 and 2 (that is, the average return after 8 years).

The estimated percentages of successful DI or SSI application vary substantially across characteristics. In general, those for whom SSA does not expect medical improvement are more likely to return within 8 years than the groups for whom medical improvement is expected or deemed possible. A higher percentage of older individuals tend to return to their original program (or to either program for former concurrent workers), compared with the overall return averages. The return percentage for those with a prior CDR is lower than average across all categories; correspondingly, the percentage is higher than average among those without a prior CDR.

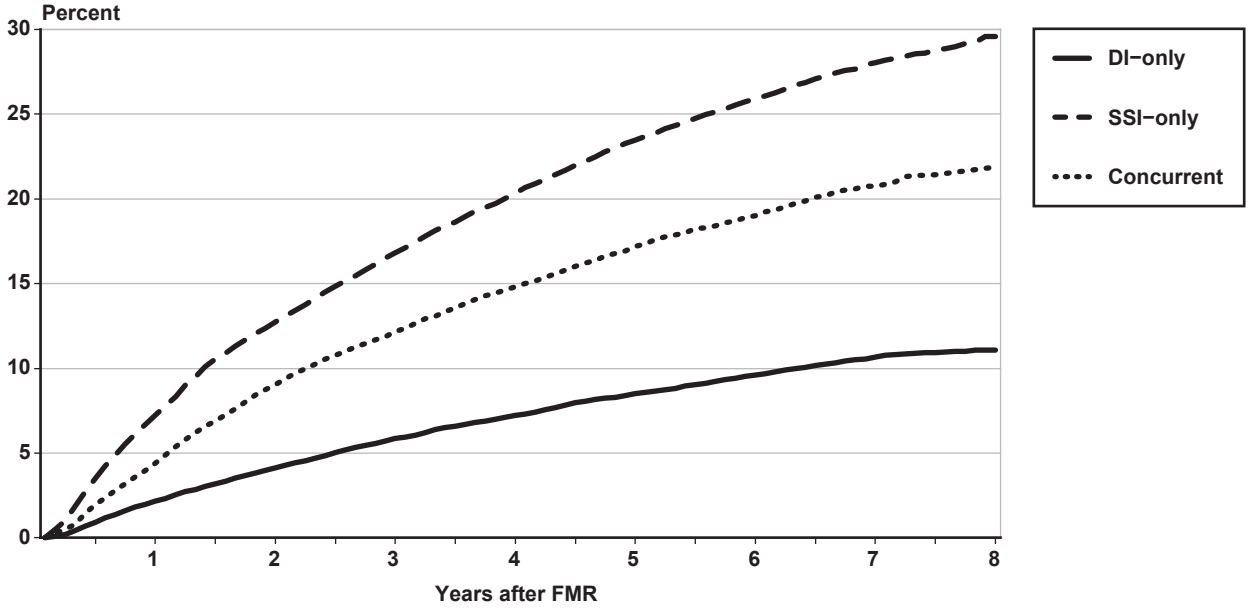
Chart 1.
Estimated percentage of former DI-only workers, SSI-only recipients, and concurrent workers who successfully applied to DI after their FMR cessation decision



SOURCE: Authors' calculations using Social Security administrative records.

NOTE: Covers cases with cessation decisions reached in FMRs conducted in 2003–2008, and followed through 2010.

Chart 2.
Estimated percentage of former DI-only workers, SSI-only recipients, and concurrent workers who successfully applied to SSI after their FMR cessation decision



SOURCE: Authors' calculations using Social Security administrative records.

NOTE: Covers cases with cessation decisions reached in FMRs conducted in 2003–2008, and followed through 2010.

Table 2.
Cumulative incidence of successful reapplication to DI or SSI after a FMR cessation decision reached during 2003–2008, by former program type and beneficiary characteristics (in percent)

Characteristic	Former DI-only workers, return to—		Former SSI-only recipients, return to—		Former concurrent workers, return to—	
	DI	SSI	DI	SSI	DI	SSI
Total	19.54	11.07	6.37	29.59	20.52	21.79
Diary type (prospective medical improvement)						
Not expected	26.77	17.14	8.57	31.09	27.25	28.45
Possible	18.96	11.48	6.27	29.78	19.64	21.51
Expected	19.99	9.39	6.10	27.74	21.66	20.92
CDR profile score						
Low	17.76	10.96	4.07	32.26	22.30	27.02
Medium	19.30	10.30	5.98	33.60	21.33	22.77
High	19.80	11.22	6.62	28.69	20.28	20.91
Age at initial CDR decision						
Younger than 30	16.02	11.41	6.53	22.05	18.12	17.98
30–39	15.90	10.62	6.31	28.65	17.96	19.75
40–49	21.82	11.84	6.33	37.84	22.72	24.49
50–59	22.37	9.93	5.94	38.83	30.29	28.48
Years in program						
Fewer than 2	22.52	6.33	. . .	. . .	20.69	16.99
2–3	22.10	10.80	. . .	. . .	23.61	21.72
Fewer than 4 (SSI only)	. . .	. . .	6.00	30.53	. . .	. . .
4–5	22.71	12.99	6.35	35.80	22.39	25.51
6 or more	15.22	10.32	6.43	27.73	16.82	19.40
Diagnosis						
Neoplasms	18.53	7.14	6.33	18.42	19.68	16.91
Intellectual disabilities	23.27	22.37	6.31	26.95	20.34	27.20
Schizophrenia and other psychotic disorders	28.37	22.17	6.56	38.46	25.32	28.30
Other mental disorders	18.28	11.13	5.71	27.71	20.16	20.78
Diseases of the—						
Endocrine, nutritional, and metabolic system	22.60	11.22	9.88	34.74	22.51	19.90
Nervous system and sense organs	16.64	10.71	7.15	30.24	17.77	19.24
Circulatory system	27.01	13.79	10.20	41.20	27.25	26.05
Respiratory system	24.09	14.32	3.72	27.33	19.70	22.67
Digestive system	18.34	9.19	3.51	29.40	18.86	16.79
Genitourinary system	30.42	13.04	12.88	34.55	26.04	23.49
Musculoskeletal system and connective tissue	17.11	9.08	5.31	33.51	20.61	22.16
Injuries	15.07	8.98	4.93	25.72	15.59	17.08
Other	19.51	11.22	9.48	27.56	22.10	21.78
Unknown [a]	14.28	8.31	6.18	31.23	15.96	20.23
Mailer receipt status						
No (direct release to FMR)	19.91	10.97	6.70	28.95	20.21	21.11
Yes	18.52	11.22	5.69	31.28	22.31	23.85
Adjudication level of initial program entry						
Initial application	20.62	10.99	6.42	28.89	20.99	21.61
Reconsideration	19.13	11.33	6.40	31.28	21.44	22.52
Administrative Law Judge or higher	16.39	10.76	5.45	32.67	18.42	20.93
Unknown	19.27	14.18	6.62	30.41	19.34	19.92
Prior CDR status						
No	22.68	12.59	6.48	33.06	23.45	24.48
Yes	7.31	5.19	6.02	18.19	10.71	11.28

(Continued)

Table 2.
Cumulative incidence of successful reapplication to DI or SSI after a FMR cessation decision reached during 2003–2008, by former program type and beneficiary characteristics (in percent)—*Continued*

Characteristic	Former DI-only workers, return to—		Former SSI-only recipients, return to—		Former concurrent workers, return to—	
	DI	SSI	DI	SSI	DI	SSI
Consultative examination request status						
No	19.86	11.30	6.91	31.08	21.33	22.48
Yes	19.06	10.70	5.81	28.13	19.60	20.37
Age at initial program entry (SSI only)						
Younger than 18	. . .	. . .	5.99	21.39	. . .	. . .
18 or older	. . .	. . .	6.52	32.85	. . .	. . .
Preeligibility earnings quartile						
Lowest	17.97	15.36	. . .	. . .	16.26	21.08
Second	21.33	13.87	. . .	. . .	19.69	23.73
Lowest or second (SSI only)	. . .	. . .	5.47	28.03	. . .	. . .
Third	20.20	10.17	6.64	30.91	22.16	21.45
Highest	18.74	4.99	7.87	31.48	23.96	19.91

SOURCE: Authors' calculations using Social Security administrative records.

NOTES: Covers cases with cessation decisions reached in FMRs conducted in 2003–2008, and followed through 2010.

. . . = not applicable.

a. Impairment type missing from CDR Waterfall data file.

Among those diagnosed with schizophrenia and other psychotic disorders, circulatory system diseases, and genitourinary system diseases, we estimate higher-than-average percentages returning to each program from all three former program types. We estimate lower-than-average percentages returning among those with neoplasms, digestive system diseases, and injuries from all three target populations. The other characteristic groups show less variation across program types.

Regression Results

We estimated Cox proportional hazard regressions of the time to first successful postcessation DI or SSI application, controlling for the characteristics described earlier. Table 3 presents the hazard model results for program returns. The aggregate hazard ratios for the entire study period appear in the upper panel of Table 3 and the hazard ratios of the time-varying effects in each model are shown in the lower panel. Recall that the variables we include as time-varying are those that did not satisfy the proportionality assumptions of each Cox regression. Note that the methodology we use to estimate the time-varying effects creates separate observations for each distinct time period during which we observe an individual. Thus, an individual who, for example, has a medium CDR profile score and is observed for 4 years in the DI-only regressions will have four different observations in the data, one for each calendar year after cessation. As a result, the number of observations for DI-only and concurrent regressions shown in Table 3 is substantially higher than the total sample values given in Table 1; but the observations for the SSI-only regressions, which do not include time-varying effects, match the Table 1 values. Appendix Table C-1 presents standard errors for the regressions.

Former DI-only Workers

All else being equal, former DI-only workers have a higher risk (hazard) of returning to DI if they were older or judged less likely to improve according to the diary type. To illustrate, the hazard ratio of 1.40 for the medical improvement not expected group implies that the group, in any given year after cessation, had 1.40 times the risk of returning to DI as did the reference group (for which medical improvement was expected). Alternatively, those with higher CDR profile scores (that is, more likely to have their eligibility ceased according to SSA's profiling model) have a lower risk of return—although this effect diminishes after 3 years. For example, in the first year after cessation, the high CDR profile-score group's hazard ratio of 0.73 indicates that the risk of return to DI for

Table 3.
Proportional hazard regression results (hazard ratios) of time to first successful application to DI or SSI within 8 years of a 2003–2008 FMR cessation decision, by former program type and beneficiary characteristics

Characteristic	Former DI-only workers, return to—		Former SSI-only recipients, return to—		Former concurrent workers, return to—	
	DI	SSI	DI	SSI	DI	SSI
			Aggregate effects			
Diary type (prospective medical improvement)						
Not expected	1.40***	1.43***	2.26***	1.09	1.31**	a
Possible	1.14***	1.22***	1.21*	1.07	1.10	a
Expected (reference group)	. . .	. . .	. . .	. . .	. . .	. . .
CDR profile score						
Low (reference group)	. . .	. . .	. . .	. . .	. . .	. . .
Medium	a	a	0.88	0.91	a	0.83*
High	a	a	1.33	0.97	a	0.78**
Age at initial CDR decision						
Younger than 30 (reference group)	. . .	. . .	. . .	. . .	. . .	. . .
30–39	1.25***	1.35***	0.80**	1.27***	a	1.37***
40–49	1.83***	1.75***	0.87	1.83***	a	1.91***
50–59	2.32***	1.76***	1.22	2.20***	a	2.37***
Years in program						
Fewer than 2 (reference group for DI-only and concurrent)	. . .	. . .	. . .	. . .	. . .	. . .
2–3	0.94	1.18	. . .	. . .	1.03	1.12
Fewer than 4 (reference group for SSI-only)	. . .	. . .	. . .	. . .	. . .	. . .
4–5	0.96	1.21	0.78*	1.09	0.97	1.16
6 or more	0.76***	1.08	0.85*	1.19***	0.86	1.02
Diagnosis						
Neoplasms	0.98	0.86	0.74	0.54***	0.82*	0.80**
Intellectual disabilities	1.34**	1.71***	1.22	1.21***	1.13	1.26**
Schizophrenia and other psychotic disorders	1.92***	2.17***	1.30	1.41***	1.56***	1.44***
Other mental disorders	1.17***	1.34***	1.01	1.06	1.06	1.11
Diseases of the—						
Endocrine, nutritional, and metabolic system	1.20*	1.13	1.58*	1.27**	1.11	0.91
Nervous system and sense organs	1.02	1.13	1.21	1.06	0.96	0.99
Circulatory system	1.35***	1.49***	1.18	1.15	1.14	1.16
Respiratory system	1.13	1.15	0.74	1.02	1.01	1.05
Digestive system	0.92	0.99	0.72	0.84	0.75**	0.81
Genitourinary system	1.48***	1.41***	2.16***	1.21*	1.32**	1.15
Musculoskeletal system and connective tissue (reference group)	. . .	. . .	. . .	. . .	. . .	. . .
Injuries	0.83***	0.96	0.92	0.93	0.69***	0.79**
Other	1.09	1.18	1.59*	1.12	1.14	1.23
Unknown [b]	0.87	0.86	1.16	1.01	0.77	0.85
Mailer receipt status						
No (direct release to FMR; reference group)	. . .	. . .	. . .	. . .	. . .	. . .
Yes	0.95	a	0.57***	0.99	1.02	1.00
Adjudication level of initial program entry						
Initial application (reference group)	. . .	. . .	. . .	. . .	. . .	. . .
Reconsideration	0.96	0.97	0.82	0.94	1.10	1.09
Administrative Law Judge or higher	0.88***	0.99	0.80*	1.01	0.91	0.96
Unknown	1.04	1.19	1.08	0.99	0.98	0.92

(Continued)

Table 3.
Proportional hazard regression results (hazard ratios) of time to first successful application to DI or SSI within 8 years of a 2003–2008 FMR cessation decision, by former program type and beneficiary characteristics—*Continued*

Characteristic	Former DI-only workers, return to—		Former SSI-only recipients, return to—		Former concurrent workers, return to—	
	DI	SSI	DI	SSI	DI	SSI
			Aggregate effects (cont.)			
Prior CDR status						
No (reference group)	. . .	. . .	. . .	. . .	. . .	. . .
Yes	a	a	1.00	0.58***	a	a
Consultative examination request status						
No (reference group)	. . .	. . .	. . .	. . .	. . .	. . .
Yes	0.94**	0.93*	0.89*	0.87***	0.84***	0.84***
Age at initial program entry (SSI only)						
Younger than 18 (reference group)	. . .	. . .	. . .	. . .	. . .	. . .
18 or older	. . .	. . .	1.16	1.09*	. . .	. . .
Preeligibility earnings quartile						
Lowest (reference group for DI-only and concurrent)	. . .	. . .	. . .	. . .	. . .	. . .
Second	a	0.89**	. . .	. . .	a	1.08
Lowest or second (reference group for SSI-only)	. . .	. . .	. . .	. . .	. . .	. . .
Third	a	0.62***	1.20**	0.93*	a	0.90*
Highest	a	0.30***	1.63***	0.82***	a	0.73***
			Time-varying effects			
Diary type (prospective medical improvement)						
Not expected						
Year 1	c	c	c	c	c	1.35
Year 2	c	c	c	c	c	1.57**
Year 3	c	c	c	c	c	0.90
Year 4	c	c	c	c	c	1.06
Year 5	c	c	c	c	c	1.71*
Year 6	c	c	c	c	c	0.42
Year 7 or 8	c	c	c	c	c	0.35
Possible						
Year 1	c	c	c	c	c	1.23**
Year 2	c	c	c	c	c	1.06
Year 3	c	c	c	c	c	1.09
Year 4	c	c	c	c	c	1.00
Year 5	c	c	c	c	c	1.09
Year 6	c	c	c	c	c	1.18
Year 7 or 8	c	c	c	c	c	0.92
Expected (reference group)	. . .	. . .	. . .	. . .	. . .	. . .
CDR profile score						
Low (reference group)	. . .	. . .	. . .	. . .	. . .	. . .
Medium						
Year 1	0.81*	0.62***	c	c	1.70**	c
Year 2	0.61***	0.72*	c	c	0.76	c
Year 3	0.74**	0.70*	c	c	0.65*	c
Year 4	1.16	0.82	c	c	1.79	c
Year 5	1.28	1.36	c	c	0.86	c
Year 6	1.13	0.63	c	c	0.23***	c
Year 7 or 8	0.78	1.76	c	c	1.60	c

(Continued)

Table 3.
Proportional hazard regression results (hazard ratios) of time to first successful application to DI or SSI within 8 years of a 2003–2008 FMR cessation decision, by former program type and beneficiary characteristics—*Continued*

Characteristic	Former DI-only workers, return to—		Former SSI-only recipients, return to—		Former concurrent workers, return to—	
	DI	SSI	DI	SSI	DI	SSI
			Time-varying effects (cont.)			
CDR profile score (cont.)						
High						
Year 1	0.73***	0.77	c	c	1.15	c
Year 2	0.68***	0.72*	c	c	0.75	c
Year 3	0.74**	0.72*	c	c	0.68	c
Year 4	1.06	0.62**	c	c	1.97*	c
Year 5	0.99	1.60	c	c	0.82	c
Year 6	1.25	0.49**	c	c	0.42**	c
Year 7 or 8	0.75	1.41	c	c	0.99	c
Age at initial CDR decision						
Younger than 30 (reference group)	. . .	. . .	. . .	. . .	. . .	. . .
30–39						
Year 1	c	c	c	c	1.47***	c
Year 2	c	c	c	c	1.35***	c
Year 3	c	c	c	c	0.99	c
Year 4	c	c	c	c	1.16	c
Year 5	c	c	c	c	1.25	c
Year 6	c	c	c	c	1.17	c
Year 7 or 8	c	c	c	c	0.73	c
40–49						
Year 1	c	c	c	c	1.80***	c
Year 2	c	c	c	c	1.79***	c
Year 3	c	c	c	c	1.54***	c
Year 4	c	c	c	c	1.50**	c
Year 5	c	c	c	c	1.72***	c
Year 6	c	c	c	c	1.94**	c
Year 7 or 8	c	c	c	c	0.76	c
50–59						
Year 1	c	c	c	c	2.61***	c
Year 2	c	c	c	c	2.51***	c
Year 3	c	c	c	c	2.21***	c
Year 4	c	c	c	c	2.81***	c
Year 5	c	c	c	c	2.85***	c
Year 6	c	c	c	c	2.77**	c
Year 7 or 8	c	c	c	c	0.44	c
Mailer receipt status						
No (direct release to FMR; reference group)	. . .	. . .	. . .	. . .	. . .	. . .
Yes						
Year 1	c	1.11	c	c	c	c
Year 2	c	0.98	c	c	c	c
Year 3	c	1.15	c	c	c	c
Year 4	c	0.59***	c	c	c	c
Year 5	c	1.08	c	c	c	c
Year 6	c	0.78	c	c	c	c
Year 7 or 8	c	0.90	c	c	c	c

(Continued)

Table 3.
Proportional hazard regression results (hazard ratios) of time to first successful application to DI or SSI within 8 years of a 2003–2008 FMR cessation decision, by former program type and beneficiary characteristics—*Continued*

Characteristic	Former DI-only workers, return to—		Former SSI-only recipients, return to—		Former concurrent workers, return to—	
	DI	SSI	DI	SSI	DI	SSI
			Time-varying effects (cont.)			
Prior CDR status						
No (reference group)	. . .	. . .	. . .	. . .	. . .	. . .
Yes						
Year 1	0.21***	0.17***	c	c	0.19***	0.23***
Year 2	0.31***	0.29***	c	c	0.24***	0.28***
Year 3	0.28***	0.34***	c	c	0.37***	0.40***
Year 4	0.35***	0.42***	c	c	0.35***	0.37***
Year 5	0.34***	0.42***	c	c	0.42***	0.37***
Year 6	0.45***	0.50***	c	c	0.48***	0.42***
Year 7 or 8	0.27***	0.25***	c	c	0.43***	0.41***
Preeligibility earnings quartile						
Lowest (reference group for DI-only and concurrent)	. . .	. . .	. . .	. . .	. . .	. . .
Second						
Year 1	1.10	c	. . .	. . .	1.19	c
Year 2	1.14	c	. . .	. . .	1.13	c
Year 3	0.97	c	. . .	. . .	1.29*	c
Year 4	1.05	c	. . .	. . .	1.41*	c
Year 5	1.25*	c	. . .	. . .	1.42*	c
Year 6	2.06***	c	. . .	. . .	1.58*	c
Year 7 or 8	1.15	c	. . .	. . .	1.21	c
Third						
Year 1	1.00	c	c	c	1.21	c
Year 2	0.92	c	c	c	1.05	c
Year 3	0.82*	c	c	c	1.48**	c
Year 4	1.01	c	c	c	1.49**	c
Year 5	0.96	c	c	c	1.53**	c
Year 6	1.43*	c	c	c	1.35	c
Year 7 or 8	1.56**	c	c	c	1.75*	c
Highest						
Year 1	0.75***	c	c	c	1.21	c
Year 2	0.78***	c	c	c	0.95	c
Year 3	0.74***	c	c	c	1.19	c
Year 4	0.70***	c	c	c	1.83***	c
Year 5	0.96	c	c	c	1.30	c
Year 6	1.52**	c	c	c	1.00	c
Year 7 or 8	0.83	c	c	c	2.60***	c
Observations	168,675	174,736	24,514	24,514	87,471	87,050

SOURCE: Authors' calculations using Social Security administrative records.

NOTES: Covers cases with cessation decisions reached in FMRs conducted in 2003–2008, and followed through 2010.

. . . = not applicable.

* = statistically significant at the 0.1 level.

** = statistically significant at the 0.05 level.

*** = statistically significant at the 0.01 level.

a. Included as a time-varying effect because the CIF did not satisfy the proportionality assumption. See lower panel.

b. Impairment type missing from CDR Waterfall data file.

c. No time-varying Cox regression was calculated because the CIF (shown in the upper panel) satisfied the proportionality assumption.

members of this group was only 73 percent of that for members of the low profile-score group. In the fourth year after cessation, however, there is no difference in risk of return between the two groups (the hazard ratio is 1.06 and is not statistically significant). Former DI-only workers with a lower risk of return include those who had a prior CDR, those who required a consultative examination, and those who were on the DI program for 6 or more years (compared with those who were on DI for fewer than 2 years).

Former DI-only workers in the highest preeligibility earnings quartiles are less likely to return to DI within 4 years than are those in the lowest quartile, all else being equal. Relative to those with musculoskeletal system and connective tissue impairments, individuals with intellectual disabilities are much more likely to return to DI, as are those with schizophrenia and other psychotic disorders; other mental disorders; endocrine, nutritional, and metabolic diseases; circulatory system diseases; and genitourinary system diseases, all else being equal. Individuals with injuries have a lower risk of return than do those with musculoskeletal impairments. Also, those initially allowed at the Administrative Law Judge level or higher have a lower risk of return to DI than do those allowed at the initial adjudication level.

Although the magnitudes differ, the signs and significance of the hazard ratios of subsequent SSI participation for former DI-only workers are generally similar to those for subsequent DI participation. The hazard ratios of individuals previously on DI for 6 or more years, those allowed at the Administrative Law Judge level or higher, and those with injuries are not significant in the SSI empirical model. Consistent with the means-tested nature of SSI, former DI-only workers in higher preeligibility earnings quartiles have a lower risk of successfully applying for SSI than do those with earnings in the lowest quartile.

Former SSI-only Recipients

All else held equal, former SSI-only recipients have a higher risk of successfully applying for DI if they are considered less likely to medically improve (as judged by diary type) and if they had higher preeligibility earnings. Former SSI-only recipients who were on the program for 4 years or more, received a mailer, or required a consultative examination have a lower risk of successfully applying for DI. Additionally, those with endocrine, nutritional, and metabolic diseases, genitourinary system diseases, and "other" impairments are more likely than those with musculoskeletal and connective tissue impairments to apply successfully for DI.

The characteristics influencing return to SSI by former SSI-only recipients differ from those influencing successful application for DI. For example, the diary type and mailer status hazard ratios are not statistically significant in the SSI regression. Additionally, those with a prior CDR are less likely to return to SSI, and those who were aged 18 or older at the time they first entered SSI are more likely to return to SSI. Neither of those variables is significant in the DI-return model. Older individuals are also more likely to return to SSI. As would be expected, those with higher preeligibility earnings are less likely to return to SSI, although we found them more likely to successfully apply for DI after SSI cessation.

Former Concurrent Workers

In the empirical models for former concurrent workers, those not expected to medically improve are more likely to return to each program, but those with medical improvement deemed possible are more likely to return only to SSI. In the SSI empirical model, those effects are sporadic; in cases where medical improvement is not expected, the hazard ratios are statistically significant in only the second and fifth years (1.57 and 1.71, respectively), and where improvement is deemed possible, only the first-year estimate (1.23) is significant. Individuals with higher CDR profile scores are less likely to return to SSI, but those effects fluctuate in the DI empirical model, with some hazard ratios above 1 and others below 1 in no consistent pattern. In both empirical models, those with a prior CDR and those who required a consultative examination are less likely to return to DI and SSI. The hazard ratios for the highest two earnings quartiles in the SSI-return empirical model are statistically significant, with individuals in those quartiles less likely to return to SSI. In the DI empirical model, the estimates suggest higher earners are somewhat more likely to enter DI, but the hazard ratios vary over the followup period. Older individuals are also more likely to return to each program.

Individuals with schizophrenia and other psychotic disorders are more likely to return to either program than are those with musculoskeletal and connective tissue impairments; those with neoplasms and injuries are less likely to return. Former concurrent workers with intellectual disabilities are more likely to return to the SSI program. As for the DI program, individuals with digestive systems diseases are less likely to

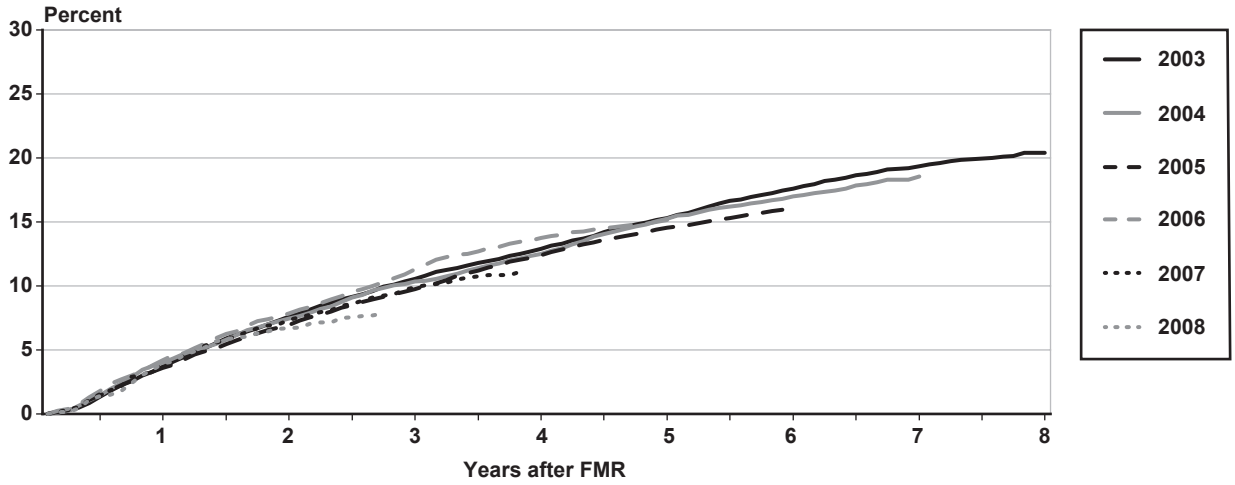
return, while those with genitourinary system diseases are more likely.

Year-Specific Estimates

As discussed earlier, our aggregate results pool several cohort years together, resulting in heterogeneous target populations. Therefore, the estimated CIFs may mask differences in the rates of program return between yearly cohorts. To explore that possibility, we present the estimates of the CIFs for each FMR cohort year for former DI-only workers returning to DI (Chart 3) and former SSI-only recipients returning to SSI (Chart 4) through the maximum followup time.[33]

For both programs, there is substantial overlap of the cohort-year estimates over time—program return is fairly similar in every followup month for each yearly cohort. However, for former DI-only workers, there is some evidence of a downward shift—the curves are somewhat flatter in successive cohorts. We compared the 95-percent confidence intervals of

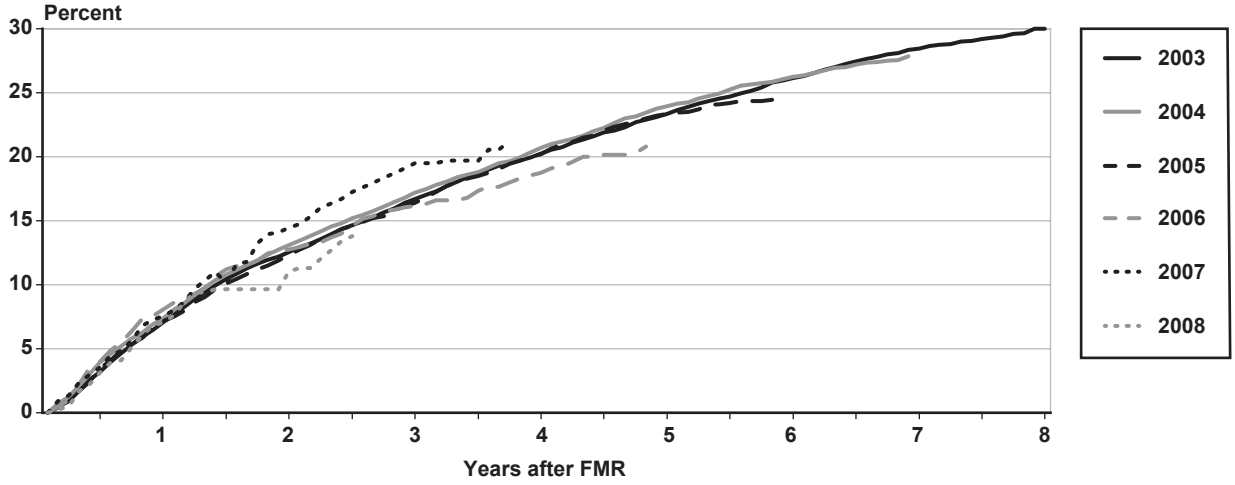
Chart 3.
Estimated percentage of former DI-only workers who successfully reapplied to DI after their FMR cessation decision, by FMR year



SOURCE: Authors' calculations using Social Security administrative records.

NOTE: Covers cases with cessation decisions reached in FMRs conducted in 2003–2008, and followed through 2010.

Chart 4.
Estimated percentage of former SSI-only recipients who successfully reapplied to SSI after their FMR cessation decision, by FMR year



SOURCE: Authors' calculations using Social Security administrative records.

NOTE: Covers cases with cessation decisions reached in FMRs conducted in 2003–2008, and followed through 2010.

the 2003 and 2008 cohorts, the earliest and latest in our sample, to determine the extent of that trend. The confidence intervals for those two cohorts overlap for all but the last 3 months of their common followup time (not shown in the charts). The difference between those two cohorts at the end of the common followup period is about 2 percentage points, but over the first year and a half they are virtually identical.[34]

That finding may result from a tightening of CDR funding over the period—inflation-adjusted CDR funding decreased from about $659 million in fiscal year 2003 to just over $300 million in fiscal year 2008.[35] With the drop in funding, SSA reduced the number of FMRs (for both SSI and DI) by about 400,000. Combined with the improved profiling models used during the period, the fewer FMRs were increasingly targeted to individuals less likely to qualify for benefits and arguably less likely to return to the program. Following the later cohorts for longer periods will help determine whether this is a long-standing result or an inconsequential blip in the data.[36]

Based on a comparison of the confidence intervals, a similar trend does not appear among former SSI-only recipients, which may be due to the smaller populations with ceased SSI eligibility in each year (down to just over 400 in 2008; the confidence intervals overlap for all years). Plots of cross-program participation and former concurrent beneficiary returns show trends similar to those for same-program returns (not shown).

For the Cox regressions, recall that stratification imposes identical hazard ratio estimates on each yearly stratum. To obtain yearly estimates, we also ran proportional hazard regressions for each yearly cohort to reveal any systematic changes in the estimated hazard ratios over time. Table 4 presents year-specific Cox regressions of same-program return (Appendix Table D-1 presents standard errors). For the DI-only population, we show regressions for the 2003 and 2008 cohorts. For the SSI-only population we show regressions for the 2003 cohort and, because the 2008 cohort is small, a pooled 2007/2008 cohort. We limit the regressions to the maximum followup period for the 2008 cohort (36 months, counting the month of eligibility cessation as month 1). As in the prior regressions, we continue to stratify by state, sex, and race, and allow for time-varying effects of variables that do not pass proportional hazards tests. Additionally, some variable categories needed to be combined because of small sample sizes; thus, the yearly models differ from those for pooled regressions.

Some hazard ratios change in magnitude and for others the direction of the risk of return changes. The only effect that is statistically significant and consistent across target populations for both years is the decreased risk of returning for those who have had a prior CDR. We also see an increased risk of return for individuals who are older (with the exception of the 2007/2008 SSI regression). In general, few

Table 4.
Proportional hazard regression results (hazard ratios) of time to first successful reapplication to DI or SSI within 3 years of a 2003 or 2008 FMR cessation decision, by selected beneficiary characteristics

Characteristic	Former DI-only workers, returned to DI within 3 years of FMR in—		Former SSI-only recipients, returned to SSI within 3 years of FMR in—	
	2003	2008	2003	2007/2008 [a]
	Aggregate effects			
Diary type (prospective medical improvement)				
Not expected	0.91	1.50	1.00	0.97
Possible	1.00	1.04	1.11*	0.99
Expected (reference group)	. . .	. . .	. . .	. . .
CDR profile score				
Low (reference group)	. . .	. . .	. . .	. . .
Medium	0.93	0.62	1.03	0.87
High	b	b	1.06	0.79
Age at initial CDR decision				
Younger than 30 (reference group)	. . .	. . .	. . .	. . .
30–39	b	b	1.28***	0.67
40–49	1.68***	2.11*	1.81***	0.74
50–59	2.13***	3.27***	2.01***	1.43

(Continued)

Table 4.
Proportional hazard regression results (hazard ratios) of time to first successful reapplication to DI or SSI within 3 years of a 2003 or 2008 FMR cessation decision, by selected beneficiary characteristics—*Continued*

Characteristic	Former DI-only workers, returned to DI within 3 years of FMR in—		Former SSI-only recipients, returned to SSI within 3 years of FMR in—	
	2003	2008	2003	2007/2008 [a]
			Aggregate effects (cont.)	
Years in program				
Fewer than 4 (reference group for DI-only)	. . .	. . .	. . .	. . .
4–5	0.97	1.13	. . .	. . .
Fewer than 6 (reference group for SSI-only)	. . .	. . .	. . .	. . .
6 or more	0.95	0.77	0.88***	0.77
Diagnosis				
Neoplasms	0.97	0.69	c	c
Intellectual disabilities	1.58*	2.71	1.22***	1.15
Schizophrenia and other psychotic disorders	1.86***	1.08	[d] 1.17***	[d] 0.91
Other mental disorders	1.16	0.86	[d] 1.17***	[d] 0.91
Diseases of the—				
Endocrine, nutritional, and metabolic system	b	b	c	c
Nervous system and sense organs	0.97	0.66	0.92	0.84
Circulatory system	1.46***	1.58	c	c
Respiratory system	1.03	1.55	c	c
Digestive system	0.80	0.38	c	c
Genitourinary system	b	b	c	c
Musculoskeletal system and connective tissue (reference group)	. . .	. . .	. . .	. . .
Injuries	0.77**	0.94	c	c
Other	0.88	0.74	c	c
Unknown [e]	0.88	1.55	c	c
Mailer receipt status				
No (direct release to FMR; reference group)	. . .	. . .	. . .	. . .
Yes	1.08	0.75	1.11*	0.99
Adjudication level of initial program entry				
Initial application (reference group)	. . .	. . .	. . .	. . .
Reconsideration	1.02	0.62	0.97	0.76
Administrative Law Judge or higher	0.92	1.09	1.06	0.59
Unknown	0.90	1.52	0.94	0.91
Prior CDR status				
No (reference group)	. . .	. . .	. . .	. . .
Yes	0.37***	0.12***	0.65***	0.48***
Consultative examination request status				
No (reference group)	. . .	. . .	. . .	. . .
Yes	0.98	0.92	0.89***	0.80
Age at initial program entry (SSI only)				
Younger than 18 (reference group)	. . .	. . .	. . .	. . .
18 or older	. . .	. . .	1.04	1.05
Preeligibility earnings quartile				
Lowest (reference group for DI-only and concurrent)	. . .	. . .	. . .	. . .
Second	1.27***	1.00	. . .	. . .
Lowest or second (reference group for SSI-only)	. . .	. . .	. . .	. . .
Third	1.07	0.84	0.98	1.11
Highest	0.87	0.78	0.86***	0.95

(Continued)

Table 4.
Proportional hazard regression results (hazard ratios) of time to first successful reapplication to DI or SSI within 3 years of a 2003 or 2008 FMR cessation decision, by selected beneficiary characteristics—*Continued*

Characteristic	Former DI-only workers, returned to DI within 3 years of FMR in—		Former SSI-only recipients, returned to SSI within 3 years of FMR in—	
	2003	2008	2003	2007/2008 [a]
	Time-varying effects			
CDR profile score				
Low (reference group)	. . .	. . .	. . .	. . .
High				
Year 1	0.68*	0.70	f	f
Year 2	1.07	0.41*	f	f
Year 3	1.17	0.14***	f	f
Age at initial CDR decision				
Younger than 30 (reference group)	. . .	. . .	. . .	. . .
30–39				
Year 1	1.05	0.87	f	f
Year 2	1.28	1.39	f	f
Year 3	1.10	2.54	f	f
Diagnosis				
Diseases of the—				
Endocrine, nutritional, and metabolic system				
Year 1	0.28*	2.84	f	f
Year 2	1.33	0.00	f	f
Year 3	1.53**	0.00	f	f
Genitourinary system				
Year 1	1.14	1.03	f	f
Year 2	1.32	2.00	f	f
Year 3	1.98***	6.17**	f	f
Musculoskeletal system and connective tissue (reference group)	. . .	. . .	. . .	. . .
Observations	21,671	6,061	9,888	1,091

SOURCE: Authors' calculations using Social Security administrative records.

NOTES: Covers cases with cessation decisions reached in FMRs conducted in 2003 or 2008 (and, for former SSI-only recipients, 2007), and followed through 2010.

. . . = not applicable.

* = statistically significant at the 0.1 level.

** = statistically significant at the 0.05 level.

*** = statistically significant at the 0.01 level.

a. Data for 2007 and 2008 are pooled because of the small SSI-only sample size for 2008.

b. Included as a time-varying effect because the CIF did not satisfy the proportionality assumption. See lower panel.

c. Sample size too small to permit statistically meaningful estimates.

d. Categories were pooled to provide a sample large enough to permit statistically meaningful estimates.

e. Impairment type missing from CDR Waterfall data file.

f. No time-varying Cox regression was calculated because the CIF shown in the upper panel satisfied the proportionality assumption.

hazard ratios are statistically significant at commonly accepted levels and even fewer are significant in the 2008 and 2007/2008 regressions. However, this is likely due to small sample sizes, leaving us unable to determine the extent to which the hazard ratios have changed over time.

Conclusion

In this article, we provide data to address the question: Do individuals who lose disability benefits because of medical improvement return to DI or SSI? We estimate that for adults whose program eligibility ceased because of medical improvement, 30 percent of former SSI-only recipients and 22 percent of former concurrent workers will return to SSI within 8 years. We estimate that about 20 percent of former DI-only workers and about 21 percent of former concurrent workers will return to DI within 8 years of the cessation decision.

Our empirical models use several variables that are also used by SSA in the profiling model that predicts the likelihood of medical recovery and therefore determines who receives a FMR. Thus, the CDR profile score is highly significant in our empirical models for former DI-only workers and, to some extent, for former concurrent workers who return to SSI. In our view, that result demonstrates the usefulness of the profiling model not just for determining who is likely to improve medically at the time of the FMR, but also who is likely to stay off the program in the future.

If funding restricts the number of CDRs to less-than-optimal levels, then some individuals whose eligibility could have ceased will instead continue receiving benefits. Against that scenario, increasing the number of CDRs would likely increase overall savings. However, the program return rate for individuals receiving those additional CDRs could exceed that for individuals undergoing current (restricted-level) CDRs within a particular type of CDR (for example, DI worker, SSI adult, SSI child); in that case, the cost/savings ratio would decline. To understand why, consider that beneficiaries whose eligibility ceases are among the least likely to have a severe disability. Thus, if the number of CDRs within a particular category were to increase above current restricted levels, then beneficiaries losing eligibility in CDRs they otherwise would not receive are likely to have somewhat more severe disabilities, and be somewhat more likely to return to the program, than those losing eligibility in current-level CDRs. Consequently, an increase in certain CDRs could lead to a higher program return rate within that category, thereby decreasing the savings per dollar spent even though overall program savings would still increase. It is important to reiterate that savings per dollar spent is highly dependent on the composition of CDR types as well as assumptions regarding interest rates and cost-of-living adjustments.

By limiting our analysis to post-FMR outcomes before age 62, our results likely describe a lower bound on program return. Individuals may be eligible for SSI based on their disability (and income and resources) until they reach age 65; thereafter, the disability requirement no longer applies. Similarly, individuals can receive DI benefits until they reach their full retirement age. Eligibility at those older ages may be amplified by worsening health. Thus, some individuals in our target population may still return to SSI or DI after what we termed early retirement; however, relatively few people reach age 62 during our observation period, so the effect of those sample restrictions on our estimates may be of little import.

One broader concern not considered in this article is the general health of individuals whose disability program participation ceases because they have medically improved to the point where they no longer meet SSA's eligibility requirements. Such individuals may still have substantial disabilities and limitations. We also cannot tell if those who return to the programs do so because their original disability worsens, or if they reapply because of a new disabling condition.[37]

This article focused on a program-integrity aspect of FMRs. Although most formerly eligible individuals remain off the program, we did not consider their economic situation. Future research should examine the extent to which formerly eligible beneficiaries and recipients reenter the labor force. The availability of employment opportunities likely affects program return. Additionally, further exploration of income (especially at the family level) and use of other programs (for example, vocational rehabilitation) for formerly eligible beneficiaries may also shed more light on why some individuals return to the program and others do not.

Table A-1.
Sample sizes and selection procedures

Restriction	DI-only workers		SSI-only recipients		Concurrent workers	
	Number	Percent	Number	Percent	Number	Percent
CDR Waterfall file extract (2003–2008)	598,728	100.00	571,003	100.00	320,412	100.00
Individuals removed from sample						
CDR profile sample or expedited reinstatement cases[a]	111,234	18.58	96,617	16.92	46,394	14.48
Final FMR decision is missing or precedes initial FMR decision	37	0.01	37	0.01	31	0.01
Died before final FMR decision	1,005	0.17	798	0.14	445	0.14
Awaiting appeal decision or still has time to appeal	682	0.11	163	0.03	479	0.15
Reached aged 60 before initial FMR decision or age 62 before final FMR decision	11,071	1.85	12,703	2.22	2,748	0.86
Eligibility did not cease or CDR profile score is missing	441,323	73.71	436,171	76.39	252,573	78.83
Final sample size	33,376	5.57	24,514	4.29	17,742	5.54

SOURCE: Authors' calculations using Social Security administrative records.

NOTE: Rounded components of percentage distributions do not necessarily sum to 100.

a. Expedited reinstatement cases are actually FMRs for individuals who have had their benefits ceased and are filing for benefits through an expedited process under which they must undergo a FMR to have benefits reinstated.

Table B-1.
Descriptive characteristics of adult DI-only workers whose FMRs resulted in eligibility cessation, 2003 and 2008

Characteristic	2003		2008		Change	
	Number	Percent	Number	Percent	Percentage points	Percent
Total	7,582	100.00	2,222	100.00	. . .	. . .
Diary type (prospective medical improvement)						
Not expected	264	3.48	139	6.26	2.78	79.89
Possible	5,142	67.82	1,652	74.35	6.53	9.63
Expected	2,176	28.70	431	19.40	-9.30	-32.40
CDR profile score						
Low	553	7.29	173	7.79	0.50	6.86
Medium	950	12.53	601	27.05	14.52	115.88
High	6,079	80.18	1,448	65.17	-15.01	-18.72
Age at initial CDR decision						
Younger than 30	679	8.96	153	6.89	-2.07	-23.10
30–39	2,483	32.75	660	29.70	-3.05	-9.31
40–49	3,216	42.42	971	43.70	1.28	3.02
50–59	1,204	15.88	438	19.71	3.83	24.12
Years in program						
Fewer than 2	87	1.15	(X)	(X)	(X)	(X)
2–3	2,552	33.66	187	8.42	-25.24	-74.99
4–5	2,169	28.61	573	25.79	-2.82	-9.86
6 or more	2,774	36.59	1,462	65.80	29.21	79.83

(Continued)

Table B-1.
Descriptive characteristics of adult DI-only workers whose FMRs resulted in eligibility cessation, 2003 and 2008—*Continued*

Characteristic	2003		2008		Change	
	Number	Percent	Number	Percent	Percent-age points	Percent
Diagnosis						
Neoplasms	913	12.04	208	9.36	-2.68	-22.26
Intellectual disabilities	95	1.25	36	1.62	0.37	29.60
Schizophrenia and other psychotic disorders	401	5.29	168	7.56	2.27	42.91
Other mental disorders	2,117	27.92	725	32.63	4.71	16.87
Diseases of the—						
Endocrine, nutritional, and metabolic system	183	2.41	32	1.44	-0.97	-40.25
Nervous system and sense organs	424	5.59	118	5.31	-0.28	-5.01
Circulatory system	304	4.01	98	4.41	0.40	9.98
Respiratory system	116	1.53	40	1.80	0.27	17.65
Digestive system	360	4.75	85	3.83	-0.92	-19.37
Genitourinary system	407	5.37	132	5.94	0.57	10.61
Musculoskeletal system and connective tissue	1,121	14.79	369	16.61	1.82	12.31
Injuries	820	10.82	130	5.85	-4.97	-45.93
Other	142	1.87	43	1.94	0.07	3.74
Unknown [a]	179	2.36	38	1.71	-0.65	-27.54
Mailer receipt status						
No (direct release to FMR)	6,358	83.86	952	42.84	-41.02	-48.91
Yes	1,224	16.14	1,270	57.16	41.02	254.15
Adjudication level of initial program entry						
Initial application	311	4.10	47	2.12	-1.98	-48.29
Reconsideration	4,815	63.51	1,394	62.74	-0.77	-1.21
Administrative Law Judge or higher	758	10.00	227	10.22	0.22	2.20
Unknown	1,698	22.40	554	24.93	2.53	11.29
Prior CDR status						
No	6,150	81.11	1,626	73.18	-7.93	-9.78
Yes	1,432	18.89	596	26.82	7.93	41.98
Consultative examination request status						
No	4,396	57.98	1,082	48.69	-9.29	-16.02
Yes	3,186	42.02	1,140	51.31	9.29	22.11
Preeligibility earnings quartile						
Lowest	1,899	25.05	607	27.32	2.27	9.06
Second	1,952	25.75	592	26.64	0.89	3.46
Third	1,865	24.60	545	24.53	-0.07	-0.28
Highest	1,866	24.61	478	21.51	-3.10	-12.60

SOURCE: Authors' calculations using Social Security administrative records.

NOTES: Rounded components of percentage distributions do not necessarily sum to 100.

. . . = not applicable.

(X) = suppressed to avoid disclosing information about particular individuals.

a. Impairment type is missing in the CDR Waterfall data file.

Table B-2.
Descriptive characteristics of adult SSI-only recipients whose FMRs resulted in eligibility cessation, 2003 and 2008

Characteristic	2003		2008		Change	
	Number	Percent	Number	Percent	Percentage points	Percent
Total	9,888	100.00	413	100.00	. . .	. . .
Diary type (prospective medical improvement)						
Not expected	433	4.38	71	17.19	12.81	292.47
Possible	7,859	79.48	315	76.27	-3.21	-4.04
Expected	1,596	16.14	27	6.54	-9.60	-59.48
CDR profile score						
Low	661	6.68	47	11.38	4.70	70.36
Medium	1,373	13.89	118	28.57	14.68	105.69
High	7,854	79.43	248	60.05	-19.38	-24.40
Age at initial CDR decision						
Younger than 30	3,671	37.13	85	20.58	-16.55	-80.42
30–39	2,784	28.16	115	27.85	-0.31	-1.11
40–49	2,710	27.41	124	30.02	2.61	8.69
50–59	723	7.31	89	21.55	14.24	66.08
Years in program						
Fewer than 4	1,144	11.57	(X)	(X)	(X)	(X)
4–5	1,988	20.11	(X)	(X)	(X)	(X)
6 or more	6,756	68.33	408	98.79	30.46	30.83
Diagnosis						
Neoplasms	301	3.04	(X)	(X)	(X)	(X)
Intellectual disabilities	1,735	17.55	108	26.15	8.60	32.89
Schizophrenia and other psychotic disorders	873	8.83	57	13.80	4.97	36.01
Other mental disorders	3,330	33.68	159	38.50	4.82	12.52
Diseases of the—						
Endocrine, nutritional, and metabolic system	332	3.36	12	2.91	-0.45	-15.46
Nervous system and sense organs	598	6.05	22	5.33	-0.72	-13.51
Circulatory system	194	1.96	(X)	(X)	(X)	(X)
Respiratory system	216	2.18	(X)	(X)	(X)	(X)
Digestive system	189	1.91	(X)	(X)	(X)	(X)
Genitourinary system	221	2.24	(X)	(X)	(X)	(X)
Musculoskeletal system and connective tissue	557	5.63	13	3.15	-2.48	-78.73
Injuries	333	3.37	(X)	(X)	(X)	(X)
Other	176	1.78	(X)	(X)	(X)	(X)
Unknown [a]	833	8.42	(X)	(X)	(X)	(X)
Mailer receipt status						
No (direct release to FMR)	7,541	76.26	90	21.79	-54.47	-71.43
Yes	2,347	23.74	323	78.21	54.47	229.44
Adjudication level of initial program entry						
Initial application	1,661	16.80	48	11.62	-5.18	-30.83
Reconsideration	6,623	66.98	308	74.58	7.60	11.35
Administrative Law Judge or higher	813	8.22	25	6.05	-2.17	-26.40
Unknown	791	8.00	32	7.75	-0.25	-3.13
Prior CDR status						
No	7,886	79.75	264	63.92	-15.83	-19.85
Yes	2,002	20.25	149	36.08	15.83	78.17

(Continued)

Table B-2.
Descriptive characteristics of adult SSI-only recipients whose FMRs resulted in eligibility cessation, 2003 and 2008—*Continued*

Characteristic	2003		2008		Change	
	Number	Percent	Number	Percent	Percent-age points	Percent
Consultative examination request status						
No	4,700	47.53	228	55.21	7.68	16.16
Yes	5,188	52.47	185	44.79	-7.68	-14.64
Age at initial program entry						
Younger than 18	2,743	27.74	106	25.67	-2.07	-7.46
18 or older	7,145	72.26	307	74.33	2.07	2.86
Preeligibility earnings quartile						
Lowest or second	4,880	49.35	204	49.40	0.05	0.10
Third	2,497	25.25	113	27.36	2.11	8.36
Highest	2,507	25.35	96	23.24	-2.11	-8.32

SOURCE: Authors' calculations using Social Security administrative records.

NOTES: Rounded components of percentage distributions do not necessarily sum to 100.

. . . = not applicable.

(X) = suppressed to avoid disclosing information about particular individuals.

a. Impairment type is missing in the CDR Waterfall data file.

Table B-3.
Descriptive characteristics of adult concurrent workers whose FMRs resulted in eligibility cessation, 2003 and 2008

Characteristic	2003		2008		Change	
	Number	Percent	Number	Percent	Percent-age points	Percent
Total	4,022	100.00	1,053	100.00	. . .	. . .
Diary type (prospective medical improvement)						
Not expected	113	2.81	46	4.37	1.56	55.52
Possible	2,667	66.31	761	72.27	5.96	8.99
Expected	1,242	30.88	246	23.36	-7.52	-24.35
CDR profile score						
Low	186	4.62	56	5.32	0.70	15.15
Medium	650	16.16	272	25.83	9.67	59.84
High	3,186	79.21	725	68.85	-10.36	-13.08
Age at initial CDR decision						
Younger than 30	1,029	25.58	232	22.03	-3.55	-16.11
30–39	1,449	36.03	362	34.38	-1.65	-4.80
40–49	1,271	31.60	343	32.57	0.97	2.98
50–59	273	6.79	116	11.02	4.23	38.38
Years in program						
Fewer than 2	123	3.06	10	0.95	-2.11	-222.11
2–3	1,416	35.21	89	8.45	-26.76	-316.69
4–5	1,063	26.43	260	24.69	-1.74	-7.05
6 or more	1,420	35.31	694	65.91	30.60	46.43

(Continued)

Table B-3.
Descriptive characteristics of adult concurrent workers whose FMRs resulted in eligibility cessation, 2003 and 2008—*Continued*

Characteristic	2003		2008		Change	
	Number	Percent	Number	Percent	Percent-age points	Percent
Diagnosis						
Neoplasms	279	6.94	56	5.32	-1.62	-30.45
Intellectual disabilities	220	5.47	86	8.17	2.70	33.05
Schizophrenia and other psychotic disorders	347	8.63	154	14.62	5.99	40.97
Other mental disorders	1,481	36.82	411	39.03	2.21	5.66
Diseases of the—						
Endocrine, nutritional, and metabolic system	78	1.94	21	1.99	0.05	2.51
Nervous system and sense organs	251	6.24	52	4.94	-1.30	-26.32
Circulatory system	132	3.28	27	2.56	-0.72	-28.13
Respiratory system	67	1.67	17	1.61	-0.06	-3.73
Digestive system	119	2.96	21	1.99	-0.97	-48.74
Genitourinary system	124	3.08	30	2.85	-0.23	-8.07
Musculoskeletal system and connective tissue	410	10.19	89	8.45	-1.74	-20.59
Injuries	365	9.08	58	5.51	-3.57	-64.79
Other	80	1.99	21	1.99	0.00	0.00
Unknown [a]	69	1.72	10	0.95	-0.77	-81.05
Mailer receipt status						
No (direct release to FMR)	3,636	90.40	653	62.01	-28.39	-31.40
Yes	386	9.60	400	37.99	28.39	295.73
Adjudication level of initial program entry						
Initial application	197	4.90	31	2.94	-1.96	-40.00
Reconsideration	2,511	62.43	705	66.95	4.52	7.24
Administrative Law Judge or higher	503	12.51	105	9.97	-2.54	-20.30
Unknown	811	20.16	212	20.13	-0.03	-0.15
Prior CDR status						
No	3,164	78.67	737	69.99	-8.68	-11.03
Yes	858	21.33	316	30.01	8.68	40.69
Consultative examination request status						
No	2,111	52.49	496	47.10	-5.39	-10.27
Yes	1,911	47.51	557	52.90	5.39	11.34
Preeligibility earnings quartile						
Lowest	956	23.77	320	30.39	6.62	27.85
Second	1,010	25.11	289	27.45	2.34	9.32
Third	1,058	26.31	254	24.12	-2.19	-8.32
Highest	998	24.81	190	18.04	-6.77	-27.29

SOURCE: Authors' calculations using Social Security administrative records.

NOTES: Rounded components of percentage distributions do not necessarily sum to 100.

. . . = not applicable.

a. Impairment type is missing in the CDR Waterfall data file.

Table C-1.
Standard errors for proportional hazard regression results (hazard ratios) of time to first successful reapplication to DI or SSI within 8 years of a 2003–2008 FMR cessation decision, by former program type and beneficiary characteristics

Characteristic	Former DI-only workers, return to—		Former SSI-only recipients, return to—		Former concurrent workers, return to—	
	DI	SSI	DI	SSI	DI	SSI
			Aggregate effects			
Diary type (prospective medical improvement)						
Not expected	0.13	0.17	0.42	0.09	0.17	a
Possible	0.04	0.07	0.12	0.05	0.06	a
Expected (reference group)	. . .	. . .	. . .	. . .	. . .	. . .
CDR profile score						
Low (reference group)	. . .	. . .	. . .	. . .	. . .	. . .
Medium	a	a	0.17	0.06	a	0.09
High	a	a	0.24	0.06	a	0.09
Age at initial CDR decision						
Younger than 30 (reference group)	. . .	. . .	. . .	. . .	. . .	. . .
30–39	0.08	0.10	0.07	0.05	a	0.08
40–49	0.11	0.13	0.09	0.08	a	0.12
50–59	0.16	0.16	0.18	0.13	a	0.20
Years in program						
Fewer than 2 (reference group for DI-only and concurrent)	. . .	. . .	. . .	. . .	. . .	. . .
2–3	0.08	0.17	. . .	. . .	0.09	0.11
Fewer than 4 (reference group for SSI-only)	. . .	. . .	. . .	. . .	. . .	. . .
4–5	0.09	0.18	0.10	0.06	0.10	0.13
6 or more	0.07	0.17	0.08	0.04	0.10	0.12
Diagnosis						
Neoplasms	0.06	0.08	0.18	0.06	0.09	0.09
Intellectual disabilities	0.17	0.23	0.21	0.09	0.13	0.13
Schizophrenia and other psychotic disorders	0.13	0.18	0.23	0.10	0.14	0.13
Other mental disorders	0.06	0.09	0.16	0.07	0.08	0.08
Diseases of the—						
Endocrine, nutritional, and metabolic system	0.13	0.18	0.37	0.12	0.18	0.15
Nervous system and sense organs	0.08	0.11	0.23	0.09	0.10	0.10
Circulatory system	0.10	0.15	0.32	0.12	0.13	0.13
Respiratory system	0.14	0.19	0.22	0.11	0.17	0.17
Digestive system	0.08	0.11	0.24	0.10	0.11	0.11
Genitourinary system	0.11	0.15	0.47	0.13	0.17	0.15
Musculoskeletal system and connective tissue (reference group)	. . .	. . .	. . .	. . .	. . .	. . .
Injuries	0.06	0.09	0.21	0.09	0.07	0.08
Other	0.12	0.18	0.38	0.13	0.18	0.18
Unknown [b]	0.11	0.14	0.22	0.08	0.15	0.15
Mailer receipt status						
No (direct release to FMR; reference group)	. . .	. . .	. . .	. . .	. . .	. . .
Yes	0.05	a	0.06	0.04	0.07	0.07
Adjudication level of initial program entry						
Initial application (reference group)	. . .	. . .	. . .	. . .	. . .	. . .
Reconsideration	0.05	0.06	0.10	0.05	0.07	0.07
Administrative Law Judge or higher	0.04	0.06	0.11	0.05	0.06	0.05
Unknown	0.10	0.14	0.10	0.04	0.12	0.10

(Continued)

Table C-1.
Standard errors for proportional hazard regression results (hazard ratios) of time to first successful reapplication to DI or SSI within 8 years of a 2003–2008 FMR cessation decision, by former program type and beneficiary characteristics—*Continued*

Characteristic	Former DI-only workers, return to—		Former SSI-only recipients, return to—		Former concurrent workers, return to—	
	DI	SSI	DI	SSI	DI	SSI
			Aggregate effects (cont.)			
Prior CDR status						
No (reference group)	. . .	. . .	. . .	. . .	. . .	. . .
Yes	a	a	0.08	0.02	a	a
Consultative examination request status						
No (reference group)	. . .	. . .	. . .	. . .	. . .	. . .
Yes	0.03	0.04	0.06	0.02	0.04	0.03
Age at initial program entry (SSI only)						
Younger than 18 (reference group)	. . .	. . .	. . .	. . .	. . .	. . .
18 or older	. . .	. . .	0.13	0.05	. . .	. . .
Preeligibility earnings quartile						
Lowest (reference group for DI-only and concurrent)	. . .	. . .	. . .	. . .	. . .	. . .
Second	a	0.04	. . .	. . .	a	0.06
Lowest or second (reference group for SSI-only)	. . .	. . .	. . .	. . .	. . .	. . .
Third	a	0.03	0.10	0.03	a	0.05
Highest	a	0.02	0.14	0.03	a	0.05
			Time-varying effects			
Diary type (prospective medical improvement)						
Not expected						
Year 1	c	c	c	c	c	0.30
Year 2	c	c	c	c	c	0.30
Year 3	c	c	c	c	c	0.26
Year 4	c	c	c	c	c	0.34
Year 5	c	c	c	c	c	0.56
Year 6	c	c	c	c	c	0.31
Year 7 or 8	c	c	c	c	c	0.27
Possible						
Year 1	c	c	c	c	c	0.11
Year 2	c	c	c	c	c	0.10
Year 3	c	c	c	c	c	0.12
Year 4	c	c	c	c	c	0.13
Year 5	c	c	c	c	c	0.15
Year 6	c	c	c	c	c	0.23
Year 7 or 8	c	c	c	c	c	0.21
Expected (reference group)	. . .	. . .	. . .	. . .	. . .	. . .
CDR profile score						
Low (reference group)	. . .	. . .	. . .	. . .	. . .	. . .
Medium						
Year 1	0.10	0.11	c	c	0.39	c
Year 2	0.08	0.13	c	c	0.15	c
Year 3	0.11	0.13	c	c	0.16	c
Year 4	0.22	0.20	c	c	0.70	c
Year 5	0.27	0.41	c	c	0.31	c
Year 6	0.34	0.20	c	c	0.09	c
Year 7 or 8	0.27	0.90	c	c	0.92	c

(Continued)

Table C-1.
Standard errors for proportional hazard regression results (hazard ratios) of time to first successful reapplication to DI or SSI within 8 years of a 2003–2008 FMR cessation decision, by former program type and beneficiary characteristics—*Continued*

Characteristic	Former DI-only workers, return to—		Former SSI-only recipients, return to—		Former concurrent workers, return to—	
	DI	SSI	DI	SSI	DI	SSI
			Time-varying effects (cont.)			
CDR profile score (cont.)						
High						
Year 1	0.08	0.13	c	c	0.27	c
Year 2	0.08	0.12	c	c	0.15	c
Year 3	0.10	0.13	c	c	0.17	c
Year 4	0.18	0.15	c	c	0.77	c
Year 5	0.19	0.48	c	c	0.29	c
Year 6	0.34	0.16	c	c	0.15	c
Year 7 or 8	0.22	0.74	c	c	0.56	c
Age at initial CDR decision						
Younger than 30 (reference group)	. . .	. . .	. . .	. . .	. . .	. . .
30–39						
Year 1	c	c	c	c	c	0.17
Year 2	c	c	c	c	c	0.16
Year 3	c	c	c	c	c	0.15
Year 4	c	c	c	c	c	0.18
Year 5	c	c	c	c	c	0.23
Year 6	c	c	c	c	c	0.29
Year 7 or 8	c	c	c	c	c	0.21
40–49						
Year 1	c	c	c	c	c	0.22
Year 2	c	c	c	c	c	0.22
Year 3	c	c	c	c	c	0.23
Year 4	c	c	c	c	c	0.25
Year 5	c	c	c	c	c	0.34
Year 6	c	c	c	c	c	0.52
Year 7 or 8	c	c	c	c	c	0.24
50–59						
Year 1	c	c	c	c	c	0.42
Year 2	c	c	c	c	c	0.42
Year 3	c	c	c	c	c	0.46
Year 4	c	c	c	c	c	0.65
Year 5	c	c	c	c	c	0.78
Year 6	c	c	c	c	c	1.14
Year 7 or 8	c	c	c	c	c	0.26
Mailer receipt status						
No (direct release to FMR; reference group)	. . .	. . .	. . .	. . .	. . .	. . .
Yes						
Year 1	c	0.13	c	c	c	c
Year 2	c	0.12	c	c	c	c
Year 3	c	0.15	c	c	c	c
Year 4	c	0.10	c	c	c	c
Year 5	c	0.20	c	c	c	c
Year 6	c	0.20	c	c	c	c
Year 7 or 8	c	0.32	c	c	c	c

(Continued)

Table C-1.
Standard errors for proportional hazard regression results (hazard ratios) of time to first successful reapplication to DI or SSI within 8 years of a 2003–2008 FMR cessation decision, by former program type and beneficiary characteristics—*Continued*

Characteristic	Former DI-only workers, return to—		Former SSI-only recipients, return to—		Former concurrent workers, return to—	
	DI	SSI	DI	SSI	DI	SSI
			Time-varying effects (cont.)			
Prior CDR status						
No (reference group)	. . .	. . .	. . .	. . .	. . .	. . .
Yes						
Year 1	0.03	0.03	c	c	0.03	0.03
Year 2	0.04	0.04	c	c	0.04	0.04
Year 3	0.04	0.05	c	c	0.06	0.06
Year 4	0.05	0.07	c	c	0.07	0.06
Year 5	0.05	0.08	c	c	0.09	0.07
Year 6	0.09	0.12	c	c	0.13	0.11
Year 7 or 8	0.08	0.09	c	c	0.14	0.12
Preeligibility earnings quartile						
Lowest (reference group for DI-only and concurrent)	. . .	. . .	. . .	. . .	. . .	. . .
Second						
Year 1	0.09	c	. . .	. . .	0.14	c
Year 2	0.10	c	. . .	. . .	0.13	c
Year 3	0.09	c	. . .	. . .	0.20	c
Year 4	0.12	c	. . .	. . .	0.25	c
Year 5	0.15	c	. . .	. . .	0.29	c
Year 6	0.36	c	. . .	. . .	0.42	c
Year 7 or 8	0.25	c	. . .	. . .	0.40	c
Third						
Year 1	0.08	c	c	c	0.14	c
Year 2	0.08	c	c	c	0.12	c
Year 3	0.08	c	c	c	0.23	c
Year 4	0.11	c	c	c	0.26	c
Year 5	0.12	c	c	c	0.32	c
Year 6	0.27	c	c	c	0.37	c
Year 7 or 8	0.31	c	c	c	0.58	c
Highest						
Year 1	0.07	c	c	c	0.15	c
Year 2	0.07	c	c	c	0.12	c
Year 3	0.07	c	c	c	0.19	c
Year 4	0.08	c	c	c	0.33	c
Year 5	0.12	c	c	c	0.28	c
Year 6	0.28	c	c	c	0.30	c
Year 7 or 8	0.18	c	c	c	0.91	c
Observations	169,466	175,582	24,522	24,522	87,854	87,437

SOURCE: Authors' calculations using Social Security administrative records.

NOTES: Covers cessation decisions reached in FMRs conducted in 2003–2008, and followed through 2010.

. . . = not applicable.

a. Included as a time-varying effect.

b. Impairment type missing from CDR Waterfall data file.

c. No time-varying Cox regression was calculated because the CIF satisfied the proportionality assumption.

Table D-1.
Standard errors for proportional hazard regression results (hazard ratios) of time to first successful reapplication to DI or SSI within 3 years of a 2003 or 2008 FMR cessation decision, by selected beneficiary characteristics

Characteristic	Former DI-only workers, returned to DI within 3 years of FMR in—		Former SSI-only recipients, returned to SSI within 3 years of FMR in—	
	2003	2008	2003	2007–2008 [a]
		Aggregate effects		
Diary type (prospective medical improvement)				
Not expected	0.18	0.74	0.12	0.52
Possible	0.07	0.30	0.06	0.45
Expected (reference group)	. . .	. . .	. . .	. . .
CDR profile score				
Low (reference group)	. . .	. . .	. . .	. . .
Medium	0.12	0.22	0.10	0.28
High	a	a	0.10	0.28
Age at initial CDR decision				
Younger than 30 (reference group)	. . .	. . .	. . .	. . .
30–39	a	a	0.08	0.20
40–49	0.19	0.89	0.11	0.25
50–59	0.28	1.48	0.18	0.51
Years in program				
Fewer than 4 (reference group for DI-only)	. . .	. . .	. . .	. . .
4–5	0.07	0.38	. . .	. . .
Fewer than 6 (reference group for SSI-only)	. . .	. . .	. . .	. . .
6 or more	0.09	0.29	0.04	0.34
Diagnosis				
Neoplasms	0.11	0.27	b	b
Intellectual disabilities	0.38	1.84	0.08	0.32
Schizophrenia and other psychotic disorders	0.24	0.41	[c] 0.06	[c] 0.23
Other mental disorders	0.11	0.26	[c] 0.06	[c] 0.23
Diseases of the—				
Endocrine, nutritional, and metabolic system				
Nervous system and sense organs	0.14	0.31	0.09	0.40
Circulatory system	0.20	0.64	b	b
Respiratory system	0.24	0.86	b	b
Digestive system	0.12	0.25	b	b
Genitourinary system				
Musculoskeletal system and connective tissue (reference group)	. . .	. . .	. . .	. . .
Injuries	0.09	0.39	b	b
Other	0.20	0.58	b	b
Unknown [d]	0.19	1.08	b	b
Mailer receipt status				
No (direct release to FMR; reference group)	. . .	. . .	. . .	. . .
Yes	0.14	0.20	0.07	0.26

(Continued)

Table D-1.
Standard errors for proportional hazard regression results (hazard ratios) of time to first successful reapplication to DI or SSI within 3 years of a 2003 or 2008 FMR cessation decision, by selected beneficiary characteristics—*Continued*

Characteristic	Former DI-only workers, returned to DI within 3 years of FMR in—		Former SSI-only recipients, returned to SSI within 3 years of FMR in—	
	2003	2008	2003	2007–2008 [a]
		Aggregate effects (cont.)		
Adjudication level of initial program entry				
Initial application (reference group)	. . .	. . .	. . .	. . .
Reconsideration	0.09	0.23	0.07	0.26
Administrative Law Judge or higher	0.07	0.27	0.08	0.21
Unknown	0.13	0.78	0.05	0.27
Prior CDR status				
No (reference group)	. . .	. . .	. . .	. . .
Yes	0.04	0.05	0.04	0.11
Consultative examination request status				
No (reference group)	. . .	. . .	. . .	. . .
Yes	0.06	0.17	0.04	0.15
Age at initial program entry (SSI only)				
Younger than 18 (reference group)	. . .	. . .	. . .	. . .
18 or older	. . .	. . .	0.07	0.36
Preeligibility earnings quartile				
Lowest (reference group for DI-only and concurrent)	. . .	. . .	. . .	. . .
Second	0.10	0.25	. . .	. . .
Lowest or second (reference group for SSI-only)	. . .	. . .	. . .	. . .
Third	0.09	0.22	0.05	0.26
Highest	0.07	0.21	0.05	0.24
		Time-varying effects		
CDR profile score				
Low (reference group)	. . .	. . .	. . .	. . .
High				
Year 1	0.14	0.31	e	e
Year 2	0.23	0.20	e	e
Year 3	0.20	0.10	e	e
Age at initial CDR decision				
Younger than 30 (reference group)	. . .	. . .	. . .	. . .
30–39				
Year 1	0.19	0.43	e	e
Year 2	0.21	0.73	e	e
Year 3	0.14	1.92	e	e

(Continued)

Table D-1.
Standard errors for proportional hazard regression results (hazard ratios) of time to first successful reapplication to DI or SSI within 3 years of a 2003 or 2008 FMR cessation decision, by selected beneficiary characteristics—*Continued*

Characteristic	Former DI-only workers, returned to DI within 3 years of FMR in—		Former SSI-only recipients, returned to SSI within 3 years of FMR in—	
	2003	2008	2003	2007–2008 [a]
			Time-varying effects (cont.)	
Diagnosis				
Diseases of the—				
Endocrine, nutritional, and metabolic system				
Year 1	0.20	1.95	b	b
Year 2	0.48	0.00	b	b
Year 3	0.32	0.00	b	b
Genitourinary system				
Year 1	0.33	0.56	b	b
Year 2	0.33	1.25	b	b
Year 3	0.30	4.73	b	b
Musculoskeletal system and connective tissue (reference group)	. . .	. . .	. . .	. . .
Observations	21,671	6,061	9,888	1,091

SOURCE: Authors' calculations using Social Security administrative records.

NOTES: Covers cessation decisions reached in FMRs conducted in 2003 or 2008 (and, for former SSI-only recipients, 2007), and followed through 2010.

. . . = not applicable.

a. SSI data for 2008 are available only in combination with 2007 data.

b. Sample size too small to permit statistically meaningful estimates.

c. Categories were pooled to provide a sample large enough to permit statistically meaningful estimates.

d. Impairment type missing from CDR Waterfall data file.

e. No time-varying Cox regression was calculated because the CIF satisfied the proportionality assumption.

Notes

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[1] The SGA earnings level for 2013 is $1,040. To be eligible for SSI, an individual is limited to $2,000 in countable resources. Once receiving SSI payments, an individual must continue to meet the resource limit but can have earnings above the SGA level. Payments are reduced $1 for every $2 earned above $65 in a month. Unearned income, such as DI benefits, is offset dollar-for-dollar after the first $20. Additional exclusions to income and assets factor into the determination of the monthly SSI payment and optional state supplemental payments. Most SSI recipients are also Medicaid participants. SSI also provides payments to individuals aged 65 or older without disabilities, although the income and asset limits still apply. See SSA (2012f) for more information on SSI rules.

[2] Insured status for DI requires an individual to have a sufficient work history, measured in quarters of coverage, over a recent period. In 2013, an individual earns one quarter of coverage for each $1,160 earned and may earn up to four quarters of coverage per year. For younger workers, fewer quarters of coverage are required to reach insured status. Individuals awarded DI benefits receive a monthly benefit check, as do certain dependent spouses, children, and parents. After 24 months, DI beneficiaries are eligible for Medicare. See SSA (2012c) for more information on DI rules.

[3] The sequential evaluation process used in a CDR, the Medical Improvement Review Standard, differs from that used in an initial disability claim. In general, the review standard process compares the beneficiary's current impairment with that examined at the most recent favorable decision to determine if medical improvement has occurred. Even with evidence of improvement, the examiner must still determine if the severity of the impairment precludes SGA. For exceptions to the Medical Improvement Review Standard, see CFR (1996).

[4] The savings rate is highly dependent on the composition of CDR types (for example, DI worker, SSI adult, SSI child), as well as assumptions regarding interest rates and cost-of-living adjustments.

[5] The president's 2012 budget requested an increase in CDR funding and $938 million for program integrity overall (OMB 2011, 163). SSA expected to spend an estimated $756 million for program integrity in fiscal year 2012 (SSA 2012a).

[6] However, some studies have looked at the related issue of SSI recipients and DI beneficiaries who return to work (for example, Bound 1989; Hennessey and Muller 1995; Schimmel, Stapleton, and Song 2010; Liu and Stapleton 2011; and Schimmel and Stapleton 2011). See also Bound and Burkhauser (1999) for an overview of the research on DI and SSI and Mashaw and Reno (1996) for additional information on DI and SSI policy.

[7] Although those studies and ours examine similar demographic characteristics, we focus on CDR characteristics not available in those studies.

[8] The mailer contains six questions about the individual's health, employment, and medical care use in the last 2 years; for more information, see SSA (2012e). We note that mailer respondents have an inherent incentive to understate their health status. Although that incentive exists throughout the disability determination and review processes, the mailer response does not require supporting medical evidence, which may amplify the incentive. Certain beneficiaries and recipients are not eligible for a mailer. For example, all child SSI recipients, including those undergoing age-18 redeterminations, receive a FMR. SSA does not initiate CDRs for SSI recipients and DI beneficiaries participating in the Ticket to Work Program as long as they are making timely progress toward their employment goals.

[9] Postponed reviews may never take place for some individuals whose characteristics change to the extent that their subsequent profiling model score indicates a lower probability of improvement. Other individuals may leave the programs for other reasons (for example, finding work, reaching full retirement age, or dying).

[10] Over our sample period of 2003 through 2008, about 2.7 percent of mailer cases with a low CDR profile score eventually resulted in a scheduled FMR; however, the availability of resources determined whether those FMRs took place.

[11] The DDS requests a consultative examination when current medical evidence is insufficient to make a decision or if there is conflicting medical information.

[12] Beginning at age 50 (or 45 in certain cases), age is added to the other factors (education, work experience, and residual functional capacity) used in determining an individual's ability to work. Because that change makes the medical improvement standard more difficult to meet, fewer FMRs for older beneficiaries result in cessations.

[13] There are four levels of appeal: reconsideration at the DDS level, the Administrative Law Judge level, an Appeals Council, and federal district court. An individual has 60 days to appeal a cessation decision at each level and 10 days to request continued payments after the initial and reconsideration determinations, although SSA may waive those time limits if there is "good cause." In fiscal year 2008, about 67 percent of adult SSI-only initial cessations

were appealed to the reconsideration level, with 69 percent of those overturned. Additionally, over three-fourths of those with a cessation at the reconsideration level appealed that year; over one-third were successful (SSA 2012b).

[14] SSA field office staff may also initiate FMRs if they have reason to believe medical improvement has occurred. However, SSA's central office initiates the vast majority of reviews, following the process described in this article.

[15] The file is created by the Office of Quality Performance and includes data from various SSA systems including 831/832/833 files, the Supplemental Security Record, the Master Beneficiary Record, and files from the Office of Disability Adjudication and Review. The CDR Waterfall file groups individuals into 10 program-participant categories (such as DI disabled-worker beneficiary, SSI child recipient, and so on), according to their status in July before the fiscal year in which the centrally initiated CDR is scheduled. We only use the SSI adult recipient, DI disabled-worker beneficiary, and disabled-worker concurrent SSI-DI beneficiary groups; other target population restrictions are detailed later. Thus, we include individuals receiving DI benefits only on their own record, not as dependents of other beneficiaries; and adult SSI recipients, meaning they either entered SSI after age 18 or continued in the program after an age-18 redetermination.

[16] We use age at the time of the initial decision for consistency with our other measures. We group individuals into four age groups: younger than 30, 30–39, 40–49, and 50–59.

[17] Expedited reinstatement allows individuals whose benefits terminated because of work to return to DI or SSI through an abbreviated process as long as their medical impairments are the same as, or related to, their original disabling impairments.

[18] Furthermore, the relative scarcity of individuals aged 60–62 would have resulted in imprecise estimates and some multicollinearity issues had we included them.

[19] Our target population includes five individuals who had two FMRs that fit our study criteria. Because the number is relatively small, we do not adjust for any serial correlation that may cause.

[20] Attaining age 62 does not affect SSI eligibility, but we use that cutoff to analyze SSI return for consistency across our analyses. Additionally, attaining age 62 may still affect an individual's behavior because of (a) a family member's receipt of benefits or (b) the difference in the definition of "insured status" between the DI and the Old-Age and Survivors Insurance programs. For example, an individual generally must have worked during the last 10 years to qualify for DI (although there are exceptions for younger workers and people with prior periods of disability); there is no such requirement for the old-age program. Future research might explore the return between age 62 and full retirement age more fully.

[21] We follow Coviello and Boggess (2004) and estimate CIFs using the Stata statistical package. See Hosmer, Lemeshow, and May (2008) for more detail on the Kaplan-Meier survival function.

[22] This estimation strategy is not without its drawbacks. The longest outcomes in our study are based on the earliest cohort in our target population. To the extent that subsequent cohorts are more or less likely to return, die, or reach early retirement age, our estimates could be either too high or too low.

[23] See Hosmer, Lemeshow, and May (2008), Singer and Willett (2003), or Allison (2010) for a fuller discussion of this model.

[24] Hosmer, Lemeshow, and May (2008, 209) note that this model is the same as "specifying an interaction between one of the covariates and the stratification variable."

[25] See also Schoenfeld (1982). Operationally (and equivalently), we test that the log hazard-ratio function is constant over time.

[26] After examining those hazard ratios and formally testing the equality of the ratios for each time-specific effect (that is, the hazard ratio of a high CDR profile score in the first year and the hazard ratio of a high CDR profile score in the second year), we determined that some of the time-varying effects could be combined. For example, as will be shown, the effect of having medical improvement deemed as possible is not significant after the first year; we could thus conceivably combine years 2 through 7+ and improve the efficiency of the empirical model. However, because we estimate multiple empirical models, we keep the yearly effects separate for consistency.

[27] Note that the baseline hazard is not directly estimated by the empirical model, but is recoverable.

[28] This model is described in Hosmer, Lemeshow, and May (2008).

[29] We note that many of the changes over time are likely due to changes in the population size, which drops by at least 70 percent for each target population. One exception is the percentage receiving a mailer, which increased in each group by more than 220 percent from 2003 to 2008. We do not present the distribution of each year's cohort by follow-up status (returned, died, reached age 62, or censored) because such a table does not account for the timing of the event and would likely lead to incorrect interpretations if not viewed carefully. However, such a table is available upon request.

[30] An individual may apply or return to DI on another individual's record (as a child or survivor of another beneficiary). However, more than 98 percent of returns to DI by DI-only and concurrent beneficiaries were on their own record. About 87 percent of former SSI-only recipients entering DI did so on their own record.

[31] It is not immediately clear why former DI-only workers would enter SSI. Most would likely retain their DI-insured status over the observed period. However, some would lose their insured status if they did not return to work. That may explain why entering SSI generally took longer than entering DI (the curve for former DI-only workers in Chart 2 is flatter than that in Chart 1). Possibly, those individuals would have been eligible for concurrent SSI payments but had not applied for SSI. Similarly, some may have been in SSI nonpayment status during the month they were selected for a CDR, and thus were categorized as DI-only on a technicality. (That circumstance may also apply to SSI-only individuals, although suspensions of payments are much less common in DI than in SSI.) Alternatively, many individuals may have spent down their assets while receiving DI benefits (or while dealing with the loss of DI), making them newly eligible for SSI.

[32] In similar (unreported) analyses, we estimate that one-third (33.2 percent) of our DI-only group reapply for DI and over one-half (54.2 percent) of the SSI-only group reapply for SSI after 8 years. Dividing those reapplication rates by the return rates we estimated, the respective postparticipation award rates are 59 percent and 55 percent for the DI-only and SSI-only individuals. Those are substantially higher than the initial award rates reported in SSA publications, which range from 31 percent to 36 percent for DI and from 40 percent to 47 percent for SSI over the observation period (SSA 2012c, 2012f).

[33] The small yearly sample sizes preclude estimating CIFs for each characteristic.

[34] The 95-percent confidence intervals overlap for all neighboring cohorts (for example, 2004 and 2005) during their common followup periods.

[35] Those amounts are adjusted to 2009 dollars using the Consumer Price Index-All Urban Consumers. The nominal values are $551 million in 2003 and $307 million in 2008.

[36] Note that the Great Recession would be expected to shift the curves in the opposite direction—with fewer jobs available, we would expect greater return by the later cohorts early in the followup period; we do not observe that result.

[37] SSA systems record no more than two diagnosis codes for an individual; differences between the precessation-decision and the program-return diagnosis codes would not necessarily identify truly new disabilities, especially in cases of high comorbidity. Similarly, worsening health due to the original disability may not be captured in the data if new impairments occur that more readily meet SSA's definition of disability.

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