National Beneficiary Survey Round 4: (Volume 3 of 3)

User's Guide for Restricted and Public Use Files

Final Report

February 7, 2012

Debra Wright
Kirsten Barrett
Eric Grau
Yuhong Zheng
Sara Skidmore

MATHEMATICA
Policy Research

This page has been left blank for double-sided copying.

Contract Number:
0600-03-60129

Mathematica Reference Number:
08978

Submitted to:
Social Security Administration
Office of Retirement and Disability Policy
ITC Building
500 E Street, SW, 9th Floor
Washington, DC 20254
Project Officer: Paul O'Leary

Submitted by:
Mathematica Policy Research
600 Maryland Avenue, SW
Suite 550
Washington, DC 20024-2512
Telephone: (202) 484-9220
Facsimile: (202) 863-1763
Project Director: Debra Wright

National Beneficiary Survey Round 4: (Volume 3 of 3)

User's Guide for Restricted and Public Use Files

Final Report

February 7, 2012

Debra Wright
Kirsten Barrett
Eric Grau
Yuhong Zheng
Sara Skidmore

MATHEMATICA
Policy Research

This page has been left blank for double-sided copying.

ERRATA

(Updated December 20, 2016)

The SF-8 mental component summary (MCS) and physical component summary (PCS) scores provided in the original National Beneficiary Survey (NBS) data files were calculated incorrectly. The original values excluded an intercept constant needed to scale the scores to general population norms. The intercept constant values are -10.11675 for the MCS, and -9.36839 for the PCS.

Because the intercept constants were not applied, the scores provided in the original data files were too high relative to what they should be on the population-based scale. Thus, if comparing NBS respondents to the general population, NBS respondents would appear healthier than they should. However, within the NBS respondent sample, the scores still appropriately represented greater or lesser mental and physical health according to the design of the SF-8.

The MCS and PCS variables included in the current data files have been corrected and are now valid for comparisons to other populations.

This page has been left blank for double-sided copying.

CONTENTS

ACRONYMS IX

I INTRODUCTION 1

A. Overview of the National Beneficiary Survey 1

1. Survey Objectives 1
2. Round 4 Survey Overview 2

B. NBS Restricted-Use and Public-Use Data Files 2

C. NBS Data Documentation Reports 3

II SAMPLE DESIGN 5

A. Overview of the Design 5

B. Target Population 8

C. Primary Sampling Unit Formation and Selection 9

D. Strata Definitions and Sample Sizes 10

III QUESTIONNAIRE DESIGN 13

A. Summary of Modules 13

1. Section A—Screener 14
2. Section B—Disability and Current Work Status 14
3. Section C—Current Employment 14
4. Section D—Jobs/Other Jobs During 2009 14
5. Section E—Awareness of SSA Work Incentive Programs and Ticket to Work 15
6. Section F—Ticket Nonparticipants in 2009 15
7. Section G—Employment-Related Services and Supports Used in 2009 15
8. Section H—Ticket Participants in 2009 15
9. Section I—Health and Functional Status 15
10. Section J—Health Insurance 15
11. Section K—Income and Other Assistance 16
12. Section L—Sociodemographic Information 16
13. Section M—Closing Information and Observations 16

B. Instrument Pathing and Preloaded Data 16

C. Comparisons with Other Questionnaires and Surveys 20

D. Special Design Considerations 21

III *(continued)*

E. Changes Made to Survey Instrument at Round 4 21

1. Changes to Reference Periods 22
2. Changes Made to Accommodate New Sample Design 22
3. Revisions to Items About Awareness of Work Incentive Programs to Address Recent Changes in Federal Programs 22
4. Addition of Items 22
5. Changes to Response Categories 23

IV DATA COLLECTION 25

A. Data Collection Procedures 25

1. Advance Contacts 25
2. Interviewer Training 26
3. Locating 27
4. CATI Data Collection 27
5. CAPI Data Collection 28
6. Assisted Interviews and Proxy Respondents 30

B. Case Disposition Summaries 31

V VARIABLE CONSTRUCTION AND EDITING 33

A. Editing of Questionnaire Variables 33

B. Imputation of Missing Values 33

C. Coding of Verbatim Responses 34

1. Health Condition Coding 36
2. Industry and Occupation 41

D. Constructed Variables 43

1. Survey Administration 43
2. Logical Zero 43
3. Duration and Amount Standardization 44
4. Pathing Combinations 44
5. Scales 45
6. Other 45

E. SSA Administrative Data 45

F. Public Use Variables 45

1. Variable Exclusion 46
2. Masking and Constructing New Variables 46

V *(continued)*

G. Additional Details on Selected Constructed Variables....46

1. Jobs Held in 2009....46
2. Service Providers....48

VI SAMPLING WEIGHTS....51

A. Computing and Adjusting the Sampling Weights: A Summary....51

1. Representative Beneficiary Sample....51
2. Ticket Participant Sample....54
3. Composite Weights....55
4. Quality Assurance....56

B. Representative Beneficiary Sample....56

1. Initial Weights....56
2. Nonresponse Adjustment....57
3. Post-Stratification....67

C. Ticket Participant Sample....67

1. Initial Weights....69
2. Dual-Frame Estimation....69
3. Nonresponse Adjustment....72
4. Trimming....88
5. Post-Stratification....90

VII IMPUTATIONS....91

A. NBS Imputations of Specific Variables....93

1. Section L: Race and Ethnicity....94
2. Section B: Disability Status Variables and Work Indicator....95
3. Section C: Current Jobs Variables....96
4. Section I: Health Status Variables....97
5. Section K: Sources of Income Other than Employment....101
6. Section L: Personal and Household Characteristics....102

VIII USING THE NBS RESTRICTED AND PUBLIC USE FILES....105

A. File Content and Technical Specifications....105

B. Choosing a Sample and Weight Variable....105

C. Estimating Sampling Variance for NBS....106

D. Codebook....108

IX REFERENCES....109

APPENDIX A: TOTAL SURVEY ERROR AND THE NBS

APPENDIX B: AVAILABILITY OF NBS VARIABLES IN THE RESTRICTED-AND PUBLIC- USE DATA FILES

APPENDIX C: CHANGES IN QUESTIONNAIRE CONTENT BETWEEN ROUNDS 3 AND 4

APPENDIX D: OTHER/SPECIFY AND OPEN-ENDED ITEMS WITH ADDITIONAL CATEGORIES CREATED DURING CODING

APPENDIX E: SOC MAJOR AND MINOR OCCUPATION CLASSIFICATIONS

APPENDIX F: NAICS INDUSTRY CODES

APPENDIX G: DESCRIPTION OF CONSTRUCTED VARIABLES

APPENDIX H: VARIABLES DROPPED OR REPLACED ON PUBLIC USE FILE AND REASON FOR DROP/REPLACEMENT

APPENDIX I: VARIABLES RECODED FOR THE PUBLIC USE FILE

APPENDIX J: PARAMETER ESTIMATES AND STANDARD ERRORS FOR NONRESPONSE MODELS

APPENDIX K: SAMPLING VARIANCE ESTIMATION AND SAMPLE SUDAAN AND SAS STATEMENTS

TABLES

I.1 Sources of Error, Description, and Methods to Minimize Impact 2

II.1 National Beneficiary and TTW Participant Sample Sizes—Initial Design 6

II.3 NBS Round 4 Actual Sample Sizes, Target Completes, and Completes—Implemented Design 7

III.1 NBS Instrument Sections 16

III.2 Survey Preloads 18

III.3 Items Skipped for Proxy Respondents 19

III.4 National Beneficiary Question Sources 20

III.5 Response Options Added to Survey Items in Round 4 23

IV.1 Summary Case Disposition by Sample Type and Sampling Strata 32

V.1 Missing Values and Description 34

V.2 Imputation Flag Values and Description 34

V.3 Supplemental Codes for Other/Specify Coding 35

V.4 Body System Diagnosis Groups (C_MAINCONBODYGROUP_1-_9, C_SECCONBODYGROUP_1-_9, C_REASBECELIGBODYGROUP) 37

V.5 Primary Diagnosis Groups (C_MAINCONDIAGGRP_1-_9, C_SECCONDIAGGRP_1-_9, C_REASBECELIGDIAGGRP) 39

V.6 Primary Diagnosis Codes Collapsed (C_MAINCONCOLDIAGGRP_1-_9, C_SECCONCOLDIAGGRP_1-_9, C_REASBECELIGDIAGGRP) 41

V.7 Supplemental Codes for Occupation and Industry Coding 42

V.8 Job Variables in Sections C and D 47

V.9 Numeric Values Associated With Provider Types 49

VI.1 Survey Population as of June 30, 2009, Initial Augmented Sample Sizes and Initial Weights by Sampling Strata in the National Beneficiary Survey 57

VI.2 Weighted Location and Response Rates for the Representative Beneficiary Sample, by Selected Characteristics 59

VI.3 Location Logistic Propensity Model: Representative Beneficiary Sample 64

VI.4 Cooperation Logistic Propensity Model: Representative Beneficiary Sample 64

VI.5 Survey Population and Initial Augmented and Final Sample Sizes, by Sampling Strata in the Participant Survey 68

VI.6 Weighted Location and Response Rates for the Ticket Participant Sample, SVRA ENs, by Selected Characteristics 73

VI.7 Weighted Location and Response Rates for the Ticket Participant Sample, Non-SVRA ENs, by Selected Characteristics 76

VI.8 Weighted Location and Response Rates for the Ticket Participant Sample, Traditional Payment System, by Selected Characteristics 79

VI.9 Variables Used in the Location Logistic Propensity Models: Ticket Participant Sample 84

VI.10 Variables in the Cooperation Logistic Propensity Models: Ticket Participant Sample 86

VI.11 Unadjusted and Adjusted R-Squared Values for Logistic Propensity Models in Ticket Participant Cross-Sectional Samples 88

VI.12 Percentages of Concordant and Discordant Pairs and Hosmer-Lemeshow p-Values for Logistic Propensity Models in Ticket Participant Cross-Sectional Samples 88

VI.13 Count of Trimmed Adjustment Factors and Range of Adjustment Factors Before and After Trimming 89

VI.14 Design Effects Attributo Unequal Weights Before and After Trimming, Within Trimming Strata, for Payment Types in the Round 4 Ticket Participant Samples 89

VII.1 Race and Ethnicity Imputations 94

VII.2 Disability Status Imputations 95

VII.3 Current Jobs Imputations 96

VII.4 Health Status Imputations, Questionnaire Variables 97

VII.5 Health Status Imputations, Constructed Variables 100

VII.6 Imputations on Sources of Income Other than Employment 101

VII.7 Imputations of Personal and Household Characteristics 103

VIII.1 NBS Sample Weights 106

ACRONYMS

ADL	Activities of Daily Living
AIC	Akaike's Information Criterion
CAPI	Computer-assisted personal interviewing
CATI	Computer-assisted telephone interviewing
CDR	Continuing Disability Review
CHAID	Chi-Squared Automatic Interaction Detector
CR	Cost Reimbursement Provider Payment Program
EN	Employment Network
IADL	Instrumental Activities of Daily Living
ICD-9	International Classification of Diseases–9th revision
ICPSR	Inter-University Consortium for Political and Social Research
IWP	Individual Work Plan
MIE	Medical Improvement Expected
MSA	Metropolitan Statistical Area
NAICS	North American Industry Classification System
NBS	National Beneficiary Survey
PMSA	Primary Metropolitan Statistical Area
PSU	Primary Sampling Units
SAS	Statistical software, formerly Statistical Analysis System (SAS is a registered trademark of SAS Institute, Inc., Cary, NC)
SOC	Standard Occupational Classification
SPSS	Statistical Package for the Social Sciences (SPSS is a registered trademark of SPSS, Inc., Chicago, IL)
SSA	Social Security Administration
SSDI	Social Security Disability Insurance (Title II of the Social Security Act)

SSI	Supplemental Security Income (Title XVI of the Social Security Act)
SSU	Secondary Sampling Units
STATA	Statistical software (STATA is a registered trademark of StataCorp LP, College Station, TX.)
SVRA	State Vocational Rehabilitation Agency (also called SVRA or VR)
TRS	Telecommunications Relay Service
TTW	Ticket to Work
TTY	Teletypewriter

I. INTRODUCTION

As part of an evaluation of the Ticket to Work and Self-Sufficiency program (TTW), Mathematica Policy Research (Mathematica) conducted Round 4 of the National Beneficiary Survey (NBS) in 2010. The survey, sponsored by the Social Security Administration's (SSA) Office of Retirement and Disability Policy, collected data from a national sample of SSA disability beneficiaries (hereafter referred to as the Representative Beneficiary Sample) and a sample of TTW participants (hereafter referred to as the Ticket Participant Sample). Mathematica collected data by using computer-assisted telephone interviewing (CATI), along with computer-assisted personal interviewing (CAPI) followups of CATI nonrespondents and of those who preferred or needed an in-person interview to accommodate their disabilities.

A voluntary employment program for people with disabilities, TTW was authorized by the Ticket to Work and Work Incentives Improvement Act of 1999 (TTWIIA). The legislation was designed to create market-driven services to help disability beneficiaries become economically self-sufficient. Under the program, SSA provides beneficiaries with a "Ticket," or coupon, that they may use to obtain employment-support services, including vocational rehabilitation, from an approved provider of their choice (called Employment Networks or ENs).[1]

The TTW program was implemented in three phases. In Phase 1, which began in February 2002, the program was rolled out in 13 states across the country. In Phase 2, which began in November 2002, the program was extended to an additional 20 states plus the District of Columbia. Phase 3, which began in November 2003, implemented TTW in the remaining 17 states and U.S. territories (Thornton, et al. 2004).

A. Overview of the National Beneficiary Survey

1. Survey Objectives

The NBS is one of several components of an evaluation to assess the impact of TTW relative to the current system, the SSA Vocational Rehabilitation Reimbursement Program, which has been in place since 1981. The evaluation includes a process analysis as well as an impact and participation analysis. Along with the NBS, data sources include SSA administrative records and interviews with program stakeholders. The NBS collects data needed for the TTW evaluation that are not available from SSA administrative data or other sources.

The NBS has five key objectives:

1. To provide critical data on the work-related activities of Supplemental Security Income (SSI) and Social Security Disability Insurance (SSDI) beneficiaries, particularly as these activities relate to TTW implementation.
2. To collect data on the characteristics and program experiences of beneficiaries who use their Ticket.

[1] For more information on the Ticket to Work program, see Thornton et al. (2004).

3. To gather information about beneficiaries who do not use their Ticket, and the reasons behind their decision.
4. To collect data that will allow us to evaluate the employment outcomes of Ticket users and other SSI and SSDI beneficiaries.
5. To collect data on service use, barriers to work, and beneficiary perceptions about TTW and other SSA programs designed to help SSA beneficiaries with disabilities find and keep jobs.

In addition to the meeting the original study objectives, the Round 4 survey was designed to assess the impact of changes made to the TTW program in July 2008 when new regulations took effect.

Round 4 NBS data will be combined with SSA administrative data to provide critical information on access to jobs and employment outcomes for beneficiaries, including those who do and do not participate in the TTW program. Though some sections of the NBS target beneficiary activity directly related to TTW, most of the survey captures more general information on SSA beneficiaries, including their disabilities, interest in work, use of services, and employment. As a result, SSA and external researchers interested in disability and employment issues may use the survey data for other policymaking and program-planning efforts.

2. Round 4 Survey Overview

The NBS was designed and implemented to maximize both response and data quality. Table 1.1 describes the most significant sources of potential non-sampling error identified at the outset of the NBS and describes the ways we attempted to minimize the impact of each. A more detailed discussion of our approach to minimizing total survey error can be found in Appendix A.

Table I.1. Sources of Error, Description, and Methods to Minimize Impact

Sources of Error	Description	Effort of Minimized
Specification	Error that results when the concept intended to be measured by the question is not the same as the concept the respondent ascribes to the question.	Cognitive interviewing during survey development[2] and pretesting; use of proxy if sample member unable to respond due to cognitive disability
Unit Non-response	Error that occurs when selected sample member is unwilling or unable to participate (failure to interview). Can result in increased variance and potential for bias in estimates if non-responders have different characteristics than responders.	Interviewer training; intensive locating; in-person data collection; refusal conversion; incentives; non-response adjustment to weights.

[2] Conducted during survey development phase under a separate contract held by Westat.

Table I.1 *(continued)*

Sources of Error	Description	Effort of Minimized
Item Non-response	Error that results when items are left blank or the respondent reports that he/she does not know the answer or refuses to provide an answer (failure to obtain and record data for all items). Can result in increased variance and potential bias in estimates if non-responders have different characteristics than responders.	Use of probes; allowing for variations in reporting units; assurance of confidentiality; assistance during interview; use of proxy if sample member unable to respond due to cognitive disability; imputation on key variables.
Measurement Error	Errors that occur as a result of the respondent or interviewer providing incorrect information (either intentionally or unintentionally). May result from inherent differences in interview mode.	Same instrument used in both interview modes; Use of probes; adaptive equipment; interviewer training, validation of in-field interviews; assistance during interview; use of proxy if sample member unable to respond due to cognitive disability
Data Processing Errors	Errors in data entry, coding, weighting, and/or analyses.	Coder training; monitoring and quality control checks of coders; quality assurance review of all weighting and imputation procedures

Item non-response was not expected to be a large source of error since there were few obviously sensitive items in the survey. In fact, item non-response was greater than 5 percent only for select items asking for wages and household income. Unit non-response was the greater concern given the population, thus the survey was designed to be executed as a dual-mode survey. Mathematica made initial attempts to interview beneficiaries using CATI followed by CAPI of nonrespondents. CAPI interviews were attempted with respondents who requested an in- person interview, needed an in-person interview to accommodate a disability, or did not have a telephone or whose telephone number could not be located. If a sample person was not able to participate in the survey because of his or her disability, Mathematica sought a proxy respondent. To promote response among Hispanic populations, the questionnaire was available in Spanish. For languages other than English or Spanish, interpreters conducted interviews. A number of additional accommodations were made available for those with hearing or speech impairments including teletypewriter (TTY), Telecommunications Relay Service (TRS), amplifiers, and instant messaging technology. To reduce measurement error, the survey instrument was identical in each mode.

Round 4 CATI data collection for both the Representative Beneficiary and Ticket Participant samples began in April 2010. Beginning in August 2010, Mathematica began in-person locating and CAPI which continued, concurrent with CATI interviewing, through December 2010. The NBS Round 4 sample comprised 3,683 cases selected for the Representative Beneficiary Sample and 4,334 cases selected for the Ticket Participant Sample (for a total 8,017 cases).

In total, Mathematica completed 5,078 interviews (including 38 partially completed interviews)—2,298 with individuals in the Representative Beneficiary Sample and 2,780 with individuals in the Ticket Participant Sample. An additional 222 beneficiaries and 77 Ticket participants were deemed ineligible for the survey.[3] Across both samples, Mathematica completed 3,936 cases by telephone and 1,142 by CAPI. In Round 4, we completed proxy interviews for 998 sample members (19.6 percent of all completes). In approximately 83 percent of proxy cases, the sample member failed the cognitive assessment or was otherwise deemed unable to respond due to a cognitive or mental impairment. Proxy interviews were completed for 611 sample persons in the Representative Beneficiary Sample (26.5 percent of completes) and 387 sample persons in the Ticket Participant Sample (13.9 percent of completes). In 152 cases, the sample member was unable to participate, and a proxy could not be identified. In approximately 60 percent of these cases, the sample member was unable to participate because they were unable to successfully complete the cognitive screener and approximately 35 percent were unable to participate based on gatekeeper report of limitation. The weighted response rates for the Representative Beneficiary Sample and the Ticket Participant Sample were 72.8 and 71.4 percent, respectively. More information about the sample selection and sampling weights is available in Chapters II and VI.

B. NBS Restricted- Use and Public- Use Data Files

To protect the anonymity of NBS respondents while still providing accurate and detailed data, we present the NBS data in two formats: a Restricted-Use Data File, which is available only to users approved by SSA and for use on specific research projects, and a Public-Use Data File, which SSA plans to release for the public's use in various statistical analyses. These two files present the same survey results, but offer differing degrees of accessibility to confidential information. For both data files, we have removed any information that could directly or indirectly identify a respondent, including respondents' names, Social Security numbers, and addresses. Because of its more widespread availability, the Public-Use Data File has undergone extensive masking and includes fewer available variables than the Restricted-Use Data File. Even with variables masked, however, the Public-Use Data File offers a wide variety of pertinent variables and topics for the general public's use. A full discussion of the masking procedures employed to create the Public-Use Data File appears in Chapter V. In Appendix B, we provide a list of the variables available in both the Restricted-Use Data File and the Public-Use Data File.

The Public-Use Data File is available to researchers through SSA's website (http://www.socialsecurity.gov/disabilityresearch/publicusefiles.html). Researchers must contact SSA to obtain permission to use the Restricted-Use Data File.

[3] Beneficiaries were statused as ineligible prior to and during the data collection period. Prior to the data collection period we received an updated data extraction identifying beneficiaries in the Representative Beneficiary Sample who may have been in a "holding" status at the time of sample selection, but who had subsequently been denied benefits. These cases were coded as ineligible prior to fielding. Due to time constraints, this extraction was limited to SSI files at Round 4. In addition, we statused as ineligible any beneficiaries who died between sample selection and the start of data collection based on information obtained from LexisNexis\Accurint prior to the start of data collection. Finally, beneficiaries who were found to be deceased, incarcerated, no longer living in the continental United States, or reported had not received benefits in the past five years at the time of the interview, were statused as ineligible during the data collection period.

C. NBS Data Documentation Reports

The following publically available reports are available from SSA on their website (http://www.socialsecurity.gov/disabilityresearch/publicusefiles.html):

- **User's Guide for Restricted- and Public-Use Data Files** (current report). This report provides users with information about the restricted- and public-use data files, including construction of the files; weight specification and variance estimation; masking procedures employed in the creation of the Public-Use File; and a detailed overview of the questionnaire design, sampling, and NBS data collection. The report provides information covered in the two reports mentioned above, including procedures for data editing, coding of open-ended responses, and variable construction, and a description of the imputation and weighting procedures and development of standard errors for the survey. In addition, this report contains an appendix addressing Total Survey Error (TSE) and the NBS.
- **NBS Public-Use File Codebook** (Rall et al. 2012). This codebook provides extensive documentation for each variable in the file, including variable name, label, position, variable type and format, question universe, question text, number of cases eligible to receive each item, constructed variable specifications, and user notes for variables on the public-use file. The codebook also includes frequency distributions and means as appropriate.
- **NBS Questionnaire** (Wright et al. 2012). This document contains all items on the Round 4 NBS and includes documentation of skip patterns, question universe specifications, text fills, interviewer directives, and consistency and range checks.
- **Editing, Coding, Imputation, and Weighting Report** (Grau et al. 2012). This report summarizes the editing, coding, imputation, and weighting procedures as well as the development of standard errors for Round 4 of the NBS. It includes an overview of the variable naming, coding, and construction conventions used in the data files and accompanying codebooks; describes how the sampling weights were computed to the final post-stratified analysis weights for both the Representative Beneficiary Sample and Ticket Participant Sample (and describes the procedures for combining the samples); outlines the procedures used to impute missing responses; and discusses procedures that should be used to estimate sampling variances for the NBS.
- **Cleaning and Identification of Data Problems Report** (Barrett et al. 2012). This report describes the data processing procedures performed for Round 4 of the NBS. It outlines the data coding and cleaning procedures and describes data problems, their origins, and the corrections implemented to create the final data file. The report describes data issues by sections of the interview and concludes with a summary of types of problems encountered and general recommendations.
- **NBS Nonresponse Bias Analysis** (Grau et al. 2012). The purpose of this report is to determine if the nonresponse adjustments applied to the sampling weights of the Round 4 NBS appropriately account for differences between respondents and nonrespondents, or if the potential for nonresponse bias still exists.

The following restricted use reports are available from SSA through a formal agreement:

- **NBS Restricted-Access Codebook** (Rall et al. 2012). This codebook provide extensive documentation for each variable in the file, including variable name, label, position, variable type and format, question universe, question text, number of cases eligible to receive each item, constructed variable specifications, and user notes for variables on the restricted-access file. The codebook also includes frequency distributions and means as appropriate.

In the discussion that follows, we provide detailed information about the NBS to assist users of the Round 4 Public- and Restricted-Use Data files. In Chapter I, we outline the NBS and the study objectives. In Chapter II, we describe the NBS sample design while in Chapter III, we provide an overview of questionnaire design. In Chapter IV, we explain NBS data collection, including the locating and calling protocols. Chapter V is devoted to discussions of variable construction and editing, the coding of verbatim and open-ended responses, and the masking procedures used to create the Public-Use Data File. In Chapter VI, we explain the weighting, imputation, and variance estimates. Finally, in Chapter VII, we discuss use of the NBS data files, including weight specification and variance estimation.

II. SAMPLE DESIGN

A. Overview of the Design

SSA implemented the TTW program in three phases spanning three years, with each phase corresponding to about one-third of the states. The initial NBS survey design called for four national cross-sectional surveys (called "rounds") of Ticket-eligible SSA disability beneficiaries—one each in 2003, 2004, 2005, and 2006—and cross-sectional surveys of Ticket participants in each of three groups of states (Phase 1, Phase 2, and Phase 3 states)—defined by the year in which the program was rolled out (Bethel and Stapleton 2002).[4] This design was subsequently revised to accommodate Phase 1 data collection starting in 2004 rather than 2003. In addition, the fourth and final round was postponed until 2010 to address the experiences of TTW participants under the new TTW regulations, implemented in July 2008. In Table II.1, we provide the original planned sample sizes for all rounds of data collection. The initial sampling and survey design documents are available from SSA on request.

Under the initial design, the Round 4 surveys were to concentrate largely on following the Ticket Participant Sample interviewed in earlier rounds and on interviewing new Ticket participants in Phase 3 states. The cross-sectional Representative Beneficiary Sample in Round 4 was to be substantially smaller than the cross-sections in earlier rounds. However, changes in the Federal regulations that substantially altered the TTW program made it less meaningful to track the long-term experiences of beneficiaries who participated in the program under the old regulations. As a result, Ticket participants from previous rounds were not re-interviewed in Round 4 as part of the longitudinal sample and the sample design underwent revision to include a larger cross-section sample of beneficiaries and a representative cross-sectional Ticket Participant Sample.

In Rounds 1 through 3, we stratified Ticket participants by the implementation phase of their state of residence and, within each phase, according to the reimbursement system under which their Ticket provider received payments: the traditional cost reimbursement (CR) program, the milestone-outcome payment system, or the outcome-only payment system.[5] In the fourth round, it was no longer necessary to stratify by implementation phase since the TTW program was up and running in

[4] The Ticket to Work program, implemented in 2002, was phased in nationwide over three years. In 2002, the first year of the program, SSA distributed Tickets in the following 13 states, known as the Phase 1 states: Arizona, Colorado, Delaware, Florida, Illinois, Iowa, Massachusetts, New York, Oklahoma, Oregon, South Carolina, Vermont, and Wisconsin. The Phase 2 rollout ran from November 2002 through September 2003, during which time SSA distributed Tickets in the following 20 states and the District of Columbia: Alaska, Arkansas, Connecticut, Georgia, Indiana, Kansas, Kentucky, Louisiana, Michigan, Mississippi, Missouri, Montana, Nevada, New Hampshire, New Jersey, New Mexico, North Dakota, South Dakota, Tennessee, and Virginia. The Phase 3 rollout ran from November 2003 through September 2004, during which time SSA distributed Tickets in 17 states: Alabama, California, Hawaii, Idaho, Maine, Maryland, Minnesota, Nebraska, North Carolina, Ohio, Pennsylvania, Rhode Island, Texas, Utah, Washington, West Virginia, and Wyoming as well as in American Samoa, Guam, the Northern Mariana Islands, Puerto Rico, and the Virgin Islands.

[5] ENs may choose to be paid under the traditional payment system or under one of two other payment systems developed specifically for the Ticket program: (1) an outcome-only payment system or (2) a milestone-outcome payment system. Under both systems, SSA makes up to 60 monthly payments to the EN for each assigned beneficiary who does not receive SSDI or SSI payments because of work or earnings. Under the milestone-outcome payment system, SSA pays smaller monthly payments in the event that the beneficiary leaves cash benefits, but it will also pay the EN for up to four milestones achieved by a beneficiary.

all areas. In Rounds 1 through 3, many of the Ticket participants sampled as having a Ticket assigned to a milestone-outcome or outcomes-only provider were signed up with State Vocational Rehabilitation Agencies (SVRA) rather than with ENs. Thus, the first three rounds overrepresented participants signed up with SVRAs. To compensate, in Round 4, we stratified the participant sample by the following provider and payment types: (1) participants with Tickets assigned to SVRAs receiving payments under the traditional CR payment system (referred to in this report as "traditional SVRA") and (2) participants with Tickets assigned to ENs or SVRAs functioning as ENs under the TTW program (referred to in this report as "non–SVRA ENs" and "SVRA ENs"). Participants who assigned their Ticket to an EN were oversampled. Because the number of tickets assigned to the SVRA ENs and Non-SVRA ENs was low among Ticket participants, we selected both a clustered and unclustered sample of participants for each provider type. The sample of participants using the traditional payment type was limited to a clustered sample. For the Ticket Participant Sample the target number of completed interviews for participants at Round 4 was 3,000 overall, with a target of approximately 750 interviews each for traditional SVRAs and SVRA ENs and 1,500 interviews for non–SVRA ENs.

Table II.1. National Beneficiary and TTW Participant Sample Sizes—Initial Design

Sample[a]		Year 1	Year 2	Year 3	Year 4	All Years[c]
National Beneficiary Samples		7,200	4,800	2,400	1,500	15,900
Longitudinal TTW Participant Samples	Phase 1 Cohorts (1)[b]	1,000	922	850	784	3,556
	(2)		1,000			1,000
	Phase 2 Cohorts (1)		1,000	922	850	2,772
	(2)			1,000		1,000
	Phase 3 Cohorts (1)			1,000	922	1,922
	(2)				1,000	1,000
	Total	**1,000**	**2,922**	**3,772**	**3,556**	**11,250**
Total Sample Size		**8,200**	**7,722**	**6,172**	**5,056**	**27,150**

Source: NBS Sample Design Report (Bethel and Stapleton 2002).

[a] Sample sizes refer to number of completed interviews.

[b] (1) = TTW participant longitudinal sample and (2) = TTW participant cross-sectional supplement.

[c] The All Years column is a tabulation of the number of interviews, not the number of sample members. Longitudinal cases may be included up to three times in these counts, depending upon the number of completed interviews for the sample member in question.

As in prior rounds, we stratified the cross-sectional Representative Beneficiary Sample by four age-based strata: 18- to 29-year-olds, 30- to 39-year-olds, 40- to 49-year-olds, and 50-year-olds and older. To ensure a sufficient number of persons seeking work, beneficiaries in the first three cohorts were oversampled (18- to 49-year-olds). The target number of completed interviews for Round 4 was 667 beneficiaries in each of the three younger age groups (18 to 29 years, 30 to 39 years, and 40 to 49 years). For those 50 years and older, the target number of completed interviews totaled 400 beneficiaries. Table II.2 summarizes the actual sample sizes and number of completed interviews for both samples under the revised design.

Table II.2. NBS Round 4 Actual Sample Sizes, Target Completes, and Completes—Implemented Design

Sampling Strata	Sample Size	Target Completed Interviews	Actual Completed Interviews
Representative Beneficiary Sample	3,683	2,400	2,298
18- to 29-years-old	1,029	666	634
30- to 39-years-old	1,032	666	625
40- to 49-years-old	603	666	643
50 or more		402	396
Ticket Participant Sample	4,334	3,000	2,780
Employment Networks	3,251	2,250	2,030
Non-SVRA providers	2,157	1,500	1,352
SVRA providers	1,094	750	678
Traditional SVRA	1,083	750	750
Total Sample Size	8,017	5,400	5,078

Source: NBS, Round 4.

For all survey rounds, the NBS used a multi-stage sampling design with a supplemental single-stage sample for some Ticket participant populations. For the multi-stage design, we used data from SSA on the counts of eligible beneficiaries in each county to form primary sampling units (PSU) consisting of one or more counties. The same PSUs selected as part of the Round 1 sampling activities were used for all survey rounds. We selected a stratified national sample of 80 PSUs; in particular, we selected with certainty Los Angeles County, California, and Cook County, Illinois,[6] because of the number of SSA beneficiaries in those counties. In view of the size of both counties (in terms of beneficiary population and geographic area), we formed secondary sampling units (SSU) by using beneficiaries' ZIP codes and then selected four SSUs from Los Angeles County and two from Cook County. We selected PSUs with probability proportional to size of their beneficiary population. The Los Angeles PSU received a double allocation because it deserved two selections based on size such that the final number of PSUs totaled 79.[7] We used age-defined sampling strata to select the sample of all SSA beneficiaries (the Representative Beneficiary Sample) from among beneficiaries residing in these PSUs/SSUs. The final sample size for the Representative Beneficiary Sample in Round 4 was 3,683 (Table II.2).

The Los Angeles County and Cook County PSUs were also used to generate the Ticket participant samples for each of three strata. Stratification for the Ticket Participant Sample was based on the payment system available to TTW service providers: (1) State Vocational Rehabilitation Agencies (SVRA) receiving payments under the traditional cost reimbursement (CR) payment system (referred to in this report as traditional SVRA), (2) SVRAs functioning as Employment Networks under the TTW program (referred to as SVRA ENs in this report), and (3) Employment Networks not linked to SVRAs (referred to as non–SVRA ENs in this report). (In Section D of this chapter, we provide details on the stratification for Ticket participants.) For participants with Tickets assigned to SVRA ENs or non–SVRA ENs, the number of Ticket participants in the clusters was insufficient to support the survey's analytic objectives; therefore, the clustered samples for the two groups were each supplemented by an independent unclustered sample of participants. All three

[6] Los Angeles County includes the city of Los Angeles; Cook County includes the city of Chicago.

[7] For the data analysis, the number of PSUs totaled 80, which is the original number of selections.

clustered Ticket Participant Samples were selected using the same PSUs, but due to the small number of Ticket participants, the Secondary Sampling Units in Los Angeles and Cook Counties were not needed for the Ticket Participant Sample and that sample was drawn from all participants in the PSUs. For participants using the Non-SVRA ENs and SVRA ENs, the unclustered sample was a stratified random sample using two strata: participants who happened to reside within the PSU boundaries and participants residing outside of the PSUs.[8] This stratification was needed to control the sample release. At Round 4, the final sample size for the Ticket Participant Sample was 4,331 (Table II.2).

B. Target Population

The target population for both the Representative Beneficiary Sample and Ticket Participant Sample consisted of SSI and SSDI beneficiaries between the ages of 18 and 64 years. For the Representative Beneficiary Sample, the target population included beneficiaries in all 50 states and the District of Columbia who were in active pay status as of June 2009.[9] Two subpopulations of these beneficiaries were not eligible for Ticket participation but were included in the survey samples to ensure complete coverage of the national beneficiary population:

- Beneficiaries who were designated as Medical Improvement Expected (MIE) at the time they received their allowances and who had not yet completed a first Continuing Disability Review (CDR).
- Young SSI recipients who were receiving benefits because of their eligibility as a child and were in the process of completing a re-determination under the adult eligibility criteria.

The beneficiary target population included approximately 12.1 million persons; approximately 2.4 million beneficiaries were in the sampled PSUs.[10]

For the Ticket Participant Sample, the target population included beneficiaries who had used the Ticket at least once as of January 1, 2009, or between January 1, 2009, and October 2, 2009. At the time of Round 4 sampling, the target population for the Ticket Participant Sample totaled 85,038

[8] Participants in the Ticket program are also SSA beneficiaries, and these samples of participants are designed to support the more detailed analysis required for the program evaluation. We expected that some Ticket participants would be selected in the beneficiary survey (and a small number of Ticket participants were selected in both samples).

[9] We obtained an updated extraction from SSA files after sampling, but just prior to data collection, indicating that a significant number of cases had no payment status because they had been denied benefits, and therefore were considered ineligible. This extraction was limited to SSI files. Hence, the payment-type distribution among ineligible cases contains more SSI-only cases and fewer SSDI-only cases than would be expected if the ineligible cases were like the rest of the population. Beneficiaries in the Trust Territories and Puerto Rico were excluded from the survey target population.

[10] The target population excludes 185,840 beneficiaries living in Puerto Rico or other outlying territories; the target population was limited to the 50 States and the District of Columbia.

Ticket participants, including 68,592 signed up with traditional SVRA providers, 12,728 signed up with non–SVRA ENs, and 3,718 signed up with SVRA ENs.[11]

C. Primary Sampling Unit Formation and Selection

PSUs were needed for both the Representative Beneficiary Survey and Ticket Participant Survey and were constructed using county-level beneficiary counts. Based on the design report for the TTW evaluation (Bethel and Stapleton 2002), the design for the Representative Beneficiary Survey called for 60 to 100 PSUs to be formed from counties or groups of counties. The design report also recommended that, in the geographically largest PSUs, SSUs would be formed according to ZIP codes and that a sample of these SSUs would be selected.[12]

Construction of the PSUs began with county-level counts of beneficiaries in four age strata (18 to 29 years, 30 to 39 years, 40 to 49 years, and 50 years and older) and a composite size measure (Folsom et al. 1987). The composite size measure incorporates the count of beneficiaries and the desired sampling rate of beneficiaries in each age stratum and permits equal probability of selection of beneficiaries within each age stratum across PSUs and approximately equal workload in each PSU. To form the PSUs, we used a score based on latitude and longitude to order counties within each state by geography. An eligible PSU needed a composite size measure above a specific level to ensure that adequate counts of beneficiaries existed in each of four sampling strata. The PSUs were also evaluated based on geographic size (square miles), topography (lakes, rivers, and mountain ranges), and transportation access among counties in a PSU (roadways in mountainous areas and bridges around the Great Lakes).

In total, 1,330 PSUs were formed with 48 percent (639 PSUs) having a single county and 84 percent (1,113 PSUs) had three or fewer counties. Of the 1,330 PSUs, just 30 (2.3 percent) included 10 or more counties; mostly rural areas in Western states.

For sample selection of PSUs, we stratified the PSUs explicitly by the Ticket program's three implementation phases (each accounting for approximately one-third of the states). As stated earlier, two PSUs were classified as certainty PSU selections (Los Angeles County and Cook County[13]); the Los Angeles County PSU was allocated twice the sample size allocated to the others. Los Angeles and Cook counties were certainty selections based on the selection frequencies for the PSUs computed using the composite size measure. To complete the sample of 80 PSUs, we selected 77 other noncertainty PSUs with probability proportional to the composite size measure within each Ticket phase stratum. The selection of the PSUs was controlled implicitly by SSA region, state within SSA region, and a beneficiary weighted score (from 0 to 9) based on the 2003 Urban

[11] The target population excludes 207 participants residing in Puerto Rico or other outlying territories; the target population was limited to the 50 States and the District of Columbia. Of these 207 participants, 8 used the traditional SVRA payment system, 19 used SVRA ENs, and 180 used non–SVRA ENs.

[12] As stated, the clustered Ticket Participant Sample was selected in the same manner as the Representative Beneficiary Sample by using the same PSUs, but given the small number of Ticket participants, the SSUs were not needed for the Ticket Participant Sample, which was drawn from all participants in the PSUs. This was not foreseen when the design report was written.

[13] Los Angeles County includes the city of Los Angeles; Cook County includes the city of Chicago.

Influence Code (Area Resource File 2003). In the Phase 1 states, we selected 23 PSUs; in the Phase 2 and 3 states, we selected 25 and 31 PSUs, respectively.

As noted, SSUs were formed in the Los Angeles and Cook County PSUs by using counts of beneficiaries in each stratum for five-digit ZIP codes and the composite size measure. Once again, SSUs consisted of one or more ZIP code areas such that the aggregate composite size measure exceeded the criterion value. In the Los Angeles PSU, 62 SSUs were formed, and 4 were selected with probability proportional to the composite size measure. In the Chicago PSU, 44 SSUs were formed, and 2 were selected with probability proportional to the composite size measure. In total, SSA beneficiaries were selected from 83 distinct locations (77 PSUs and 6 SSUs) across the 50 states and the District of Columbia. Ticket participants for the clustered sample were selected from 80 distinct locations (77 noncertainty PSUs and the entirety of the 2 certainty PSUs).[14] PSUs and SSUs were selected once for Round 1 sampling activities, and the same PSUs and SSUs were used for all subsequent rounds.

D. Strata Definitions and Sample Sizes

The sample is designed to be statistically and operationally efficient and to provide adequate sample sizes for the planned analyses. To ensure a sufficient number of persons seeking work, we classified the Representative Beneficiary Sample into sampling strata based on age, with persons in the younger age categories selected at higher rates than those in the oldest age category; the age groups—18 to 29 years, 30 to 39 years, 40 to 49 years, and 50 years and older—were the sampling strata. The target number of completed interviews for Round 4 was 667 beneficiaries in each of the three younger age groups (18 to 29 years, 30 to 39 years, and 40 to 49 years). For those 50 years and older, the target number of completed interviews totaled 400 beneficiaries.

In Rounds 1 through 3, Ticket participants were stratified by implementation phase of their state of residence and within each phase, according to the reimbursement system their Ticket provider was receiving payments under: the traditional CR program, the milestone-outcome payment system, and the outcome-only payment system.[15] In the fourth round, it was no longer necessary to stratify by implementation phase since the TTW program was up and running in all areas. Because we stratified only on payment type and did not include provider type for Rounds 1 through 3, many of the Ticket participants sampled as having a Ticket assigned to a milestone-outcome and outcomes-only provider were signed up with SVRAs rather than with ENs. Thus, the first three rounds overrepresented participants with SVRAs. To compensate for the overrepresentation, we stratified the participant sample in Round 4 by the following provider and payment types: (1) participants with Tickets assigned to traditional SVRAs, (2) participants with Tickets assigned to SVRA ENs, and (3) participants with Tickets assigned to non–SVRA ENs.

[14] Although the number of distinct locations is smaller for the clustered portion of the Ticket Participant Sample compared to the Representative Beneficiary Sample, the geographic area is larger because the six SSUs were subsets of two certainty PSUs.

[15] ENs may choose to be paid under the traditional payment system or under one of two other payment systems developed for the Ticket program: (1) an outcome-only payment system or (2) a milestone-outcome payment system. Under both systems, SSA makes up to 60 monthly payments to the EN for each assigned beneficiary not receiving SSDI or SSI payments because of work or earnings. Under the milestone-outcome payment system, SSA pays smaller monthly payments in the event that the beneficiary leaves cash benefits but also pays the EN for up to four milestones achieved by a beneficiary.

Participants using the milestone-outcome and outcome-only payment system had Tickets assigned to both SVRA ENs and non–SVRA ENs (see the "Evaluation of the Ticket to Work Program Initial Report," Thornton et al. (2004), for more information about the EN payment systems). Because the number of tickets assigned to the SVRA ENs and Non-SVRA ENs was low among Ticket participants, we selected both a clustered and unclustered sample of participants for each provider type. The sample of participants using the traditional payment type was limited to a clustered sample. The target number of completed interviews for participants in the cross-sectional samples in Round 4 was 3,000 overall, with a target of approximately 750 interviews each for traditional SVRAs and SVRA ENs and 1,500 interviews for non–SVRA ENs.

In order to statistically combine the clustered and unclustered samples, we needed to establish comparability between the portions of the samples related to the data collection effort because, while both samples received central office locating and telephone interviewing, only the clustered sample received field locating and in-person interviewing if necessary. Sample members in both the clustered and unclustered samples underwent the same level of central office locating activities (including batch processing through search databases and individualized locating efforts) to identify a telephone number so that a telephone interview could be attempted.

For the unclustered sample, we made no further attempt to locate potential respondents who could not be located by the central office. Sample members with no field followup (in the unclustered sample) were not "selected" for field followup. This process is analogous to the accepted practice of subsampling nonrespondents for more intensive effort; in this case, we essentially subsampled cases in the clustered sample for field followup. For the clustered sample, beneficiaries who could not be located or required an in-person interview were eligible for field followup and assigned to field interviewers. The sample members in the clustered sample who were assigned for field work represented the subpopulation who required field work for locating and interviewing from both sample components.

The sample members in both the clustered and unclustered samples were comparable up to the point of assignment of sample members for field work and therefore could be statistically combined because the two samples represented the same subpopulation (Ticket participants who could be located by central office locating efforts and interviewed by telephone).

For fielding purposes in both the Representative Beneficiary Sample and the Ticket Participant Samples, we selected a larger sample than needed (called the "augmented sample") to ensure that an adequate pool of sample would be available if we found that the response and eligibility rates during data collection differed from our initial assumptions. Within each stratum, we selected an equal probability sample of beneficiaries or participants by using a sequential selection algorithm with the sampling frame sorted by disability diagnosis, race andethnicity, and ZIP code to form the augmented sample. These sorting factors ensured an approximate proportional allocation of the sample across levels of these factors and therefore enhanced the face validity of the sample across these factors.

For the Representative Beneficiary Sample, we selected for the augmented sample approximately 3,333 beneficiaries in each of the three younger age groups (18 to 29 years, 30 to 39 years, and 40 to 49 years) and 2,000 beneficiaries in the oldest cohort, enough to allow for approximately 667 completed interviews in the younger groups and 400 in the oldest cohort. Any beneficiaries that were deceased as of June 30, 2009, were completely excluded from the sample frame and were therefore not part of this sample. The size of the augmented sample in the Ticket Participant Sample, 11,863, was sufficient to ensure approximately 3,000 target completes, though

the multiplicative factor used to determine the augmented sample size based on the targeted completes varied by the three payment system/provider type subpopulations. Any participants that were deceased as of October 2, 2009, were excluded from the sample frame and were therefore not part of this sample.[16]

For both the Representative Beneficiary and Ticket Participant samples, the larger augmented samples were randomly partitioned into subsamples (called "waves") to allow the controlled release of the sample throughout the data collection effort. We created between 20 and 115 waves, depending on the stratum of the beneficiary or participant sample. During the data collection period, we monitored the sample results and determined whether, and in which strata and PSUs, additional waves of sampled cases were needed. Round 4 required three releases, of which the first was the largest. After the first release, the number needed in the second or third release in each PSU depended on the number of completed interviews observed from the cases worked in the first release. For some strata and PSUs in the participant sample, the number of participants available for sampling was so small that all cases were released in the first release. However, for most strata and PSUs, the number of cases released was far smaller than the number available in the augmented sample.

[16] We statused as ineligible any beneficiaries who died between sample selection and the start of data collection based on information obtained from LexisNexis\Accurint prior to the start of data collection. Additionally, beneficiaries who were found to be deceased, incarcerated, no longer living in the continental United States, or reported had not received benefits in the past five years at the time of the interview, were statused as ineligible during the data collection period. The proportion of cases found to be ineligible at data collection was small enough that the impact on yield rates was small, and is similar to the ineligibility rates from past rounds.

III. QUESTIONNAIRE DESIGN

The NBS collects data on a wide range of topics, including employment, disability, experience with SSA programs, employment services used in the past year, health and functional status, health insurance, income and other assistance, and sociodemographic information. The survey items were developed and initially pre-tested as part of a separate contract held by Westat. Mathematica subsequently made revisions to the survey items to prepare the instrument for CATI/CAPI programming and then added minor wording changes in response to pre-testing results. Minor revisions made in Round 4 accommodated changes to the sample design and captured changes to the TTW program. The survey instrument is available from SSA (http://www.socialsecurity.gov/disabilityresearch/publicusefiles.html).

To promote responses among Hispanic populations, Mathematica translated the questionnaire into Spanish. If, in some cases, a Spanish speaker was more familiar with a word or term in English than in Spanish, we provided the term in both languages, allowing interviewers to reinforce the question by using the second language as a probe, if necessary.[17] We treated measurements in a similar way. Questions that mentioned a particular weight also mentioned the kilogram equivalent.[18] Interpreters participated as needed to conduct interviews in languages other than Spanish.

A. Summary of Modules

The questionnaire is divided into 13 sections, labeled A through M:

- Section A—Introduction and Screener
- Section B—Disability and Current Work Status
- Section C—Current Employment
- Section D—Jobs/Other Jobs During 2009
- Section E—Awareness of SSA Work Incentive Programs and Ticket to Work
- Section F—Ticket Non-Participants in 2009
- Section G—Employment-Related Services and Supports Used in 2009
- Section H—Ticket Participants in 2009
- Section I—Health and Functional Status
- Section J—Health Insurance
- Section K—Income and Other Assistance

[17] For example, on Item L-5: Did {you/NAME} receive any food stamps last month? Spanish: Recibió {usted/NAME} food stamps o cupones de alimentos el mes pasado?

[18] For example, on Item Jb-10: {Do you/Does NAME} have any difficulty lifting and carrying something as heavy as 10 pounds, such as a full bag of groceries? Spanish: Tiene {usted/NAME} cualquier dificultad en levantar y cargar algo que pesa hasta unas 10 libras {4½ kilos}, tal como una bolsa llena con compras del mercado?

- Section L—Sociodemographic Information
- Section M—Closing Information and Observations

Descriptions of each section follow.

1. Section A—Screener

This section confirms that the interviewer has contacted the correct sample person and verifies that the sample person is still eligible for the survey. In addition, the screener allows interviewers to:

- Identify any barriers to participation and, if needed, identify a proxy respondent. The sample member was offered every opportunity to complete the interview himself or herself; a proxy responded only if necessary.
- Identify the need for an interpreter for a respondent speaking a language other than English or Spanish.
- Administer a cognitive assessment to ensure that the respondent was capable of completing a complex survey.

The screener presents three statements: (1) a brief description of what it means that the survey is confidential, (2) what it means that the survey is voluntary and (3) an overview of the study topics; and then asks the respondent to reiterate the concepts in his or her own words. If the respondent could not restate a concept, the question was read a second time. If the respondent still could not restate a concept, he or she was asked if someone else (such as a friend, parent, caseworker, or payee) could answer questions about his or her health, daily activities, and any jobs he or she might hold. We then pursued an interview with the proxy respondent. To minimize bias in reporting, the screener did not ask the proxy respondent to provide subjective assessments on behalf of the sample person with respect to, for example, satisfaction with jobs or programs. The constructed variable C_Rtype indicates whether the sample person or a proxy completed most of the interview.

2. Section B—Disability and Current Work Status

This section collects information on the beneficiary's limiting physical or mental condition(s) and current employment status. If the beneficiary is not currently employed, the section explores reasons for not working. It also asks questions to determine the job characteristics that are important to beneficiaries and collects information about work-related goals and expectations.

3. Section C—Current Employment

This section collects detailed information about the beneficiary's current job(s). Respondents address type of work performed, type of employer, hours worked, benefits offered, and wages earned. Section C also asks about work-related accommodations—those received as well as those needed but not received. Other questions solicit information about job satisfaction.

4. Section D—Jobs/Other Jobs During 2009

This section collects information about employment during the 2009 calendar year, including type(s) of employer(s), hours worked, wages earned, and reasons for leaving employment, if applicable. Other questions ask whether beneficiaries worked or earned less than they could have

(and, if so, why) and collect information about experiences related to Social Security benefit adjustments due to work.

5. Section E—Awareness of SSA Work Incentive Programs and Ticket to Work

This section asks questions to assess whether the beneficiary is aware of or is participating in SSA work incentive programs and services. For the TTW program, we collected information on how beneficiaries learned about the program and the names and dates they signed up with their current service providers.

6. Section F—Ticket Nonparticipants in 2009

This section pertains to beneficiaries who do not participate in the TTW program and collects data on reasons for nonparticipation. It asks whether the beneficiary has attempted to learn about employment opportunities (including TTW), and any problems with Employment Networks or other employment agencies.

7. Section G—Employment-Related Services and Supports Used in 2009

Questions in this section ask beneficiaries about their use of employment-related services in calendar year 2009, including types of services received, types of providers used, length of service receipt, how the services were paid for, and reasons for and satisfaction with services. Other questions ask about sources of information about services and the nature of any services needed but not received.

8. Section H—Ticket Participants in 2009

This section asks 2009 Ticket participants about their program experiences, including their decision to participate in the Ticket program, the types of information they used to select their current service providers, development of their individual work plan (IWP), and any problems with services provided by an Employment Network. The section includes a series of questions about how problems with ENs were resolved and overall satisfaction with the TTW program.

9. Section I—Health and Functional Status

This section asks about the beneficiary's health status and daily functioning, including the need for special equipment or assistive devices. It asks for information about general health status (via the SF-8™ [19] scale), difficulties with Activities of Daily Living (ADLs) and Instrumental Activities of Daily Living (IADLs), functional limitations, substance abuse/dependence, and treatment for mental health conditions.

10. Section J—Health Insurance

Questions in this section collect information about the beneficiary's sources of health insurance, both at the time of interview and during calendar year 2009.

[19] SF-8™ is a trademark of QualityMetric, Inc.

11. Section K—Income and Other Assistance

Questions in this section ask about sources of income, including income received from earnings, Social Security, workers' compensation, and other government programs and sources.

12. Section L—Sociodemographic Information

This section collects basic demographic information about the beneficiary, such as race, ethnicity, education, parental education, marital status, living arrangements, and household income.

13. Section M—Closing Information and Observations

This section collects address information for the sample person so that the $10 incentive check may be mailed. The interviewer also records the reasons that a proxy or assistance was required, if appropriate, and documents special circumstances.

B. Instrument Pathing and Preloaded Data

Sample members in the Representative Beneficiary Sample and the Ticket Participant Sample received the same version of the NBS questionnaire. We did not base pathing to questions about participation in the TTW program on sample type but rather on answers given to items in previous sections (awareness of the program and use of a Ticket). Similarly, both CATI and CAPI respondents received the same questionnaire. The NBS required, on average, 50 minutes to administer. The interview length ranged from 16 to 180 minutes, excluding TTY, TRS, and instant messaging interviews.

Interviewers asked all respondents questions from Sections A, B, E, G, I, J, K, L, and M. Only respondents who reported that they were currently working answered the questions in Section C. Similarly, only respondents who reported working in 2009 answered the questions in Section D. Section F applied only to respondents who reported that they had never tried to obtain a Ticket from SSA, had never tried to use a Ticket to sign up with a provider, or did not sign up with a provider in 2009. Only respondents who reported using their Ticket to sign up with a provider in 2009 answered questions in Section H. In Table III.1, we provide a summary description of the main questionnaire pathing.

Table III.1. NBS Instrument Sections

Section	Title of Section	Respondents Receiving the Section
A	Screener	All respondents
B	Disability and Current Work Status	All respondents
C	Current Employment	Respondents who answer (B24 = YES) Question B24: Are you currently working at a job or business for pay or profit?
D	Jobs/Other Jobs During 2009	Respondents who answer (B30 = YES) Question B30: Did you work at a job or business for pay or profit any time in 2009?
E	Awareness of SSA Work Incentive Programs and Ticket to Work	All respondents

Table III.1 *(continued)*

Section	Title of Section	Respondents Receiving the Section
F	Ticket Nonparticipants in 2009	Respondents who have heard of the Ticket to Work program (answer E21, E24, or E25 =YES) AND Respondents who answer (E35 = NO, DON'T KNOW, OR REFUSED) Question E35: Did you ever try to get a Ticket from Social Security or anywhere else? OR Respondents who answer (E36 = NO, DON'T KNOW, OR REFUSED) Question E36: Have you ever used your Ticket to sign up with an Employment Network? OR Respondents who answer (E37/E7b = NO, DON'T KNOW, OR REFUSED) Question E37/E37b: Were you signed up with any Employment Network/State Vocational Rehabilitation Agency at any time in 2009?
G	Employment-Related Services and Supports Used in 2009	All respondents
H	Ticket Participants in 2009	Respondents who have heard of the Ticket to Work program (answer E21, E24, or E25 =YES) AND Respondents who answer (E37/E37b = YES) Question E37/E37b: Were you signed up with any Employment Network/State Vocational Rehabilitation Agency at any time in 2009?
I	Health and Functional Status	All respondents
J	Health Insurance	All respondents
K	Income and Other Assistance	All respondents
L	Sociodemographic Information	All respondents
M	Closing Information and Observations	All respondents

Source: NBS, Round 4.

The NBS instrument, which Mathematica programmed in Blaise, is complex and involves several integrated skips within and across sections. The use of preloaded SSA administrative data and allowances for proxy participation introduce further complexities into the questionnaire pathing. Preloaded data on respondents' disability-benefits status (SSI, SSDI, or both), age at which respondents first received SSI benefits, and TTW participant status determine pathing for certain survey items. Other administrative variables serve as fills for particular items to provide respondents with names of local programs or to prompt recognition of program participation. In Table III.2, we provide a complete list and description of the preloaded variables.

Table III.2. Survey Preloads

Variable	Definition	Purpose
Sampgrp	Ticket participant provider/payment type	Used to determine pathing for awareness of TTW items. Only respondents identified by SSA as having a Ticket assigned to an EN (Sampgrp =1) and who indicated that they had never heard of the TTW program were asked Item E24. In addition, participants with a Ticket assigned to an SVRA (Sampgrp = 2) were asked about services received from an SVRA (Items E36b and E36c).
Bstatus	SSA benefit type (SSI only, SSDI only, or SSI and SSDI) received by sample member	Used to determine pathing for awareness of SSA work incentive items. Only respondents who received SSDI benefits were asked Items E3 through E13. Only respondents who received SSI were asked Items E15 through E18.
DOB	Sample member date of birth	Reported date of birth (or age) matched with administrative data to verify that the correct person was contacted in the screener portion of the survey.
ENsample	Name of the EN to which the sample member's Ticket was assigned at the time the TTW Participant Sample was drawn	Used as a fill at Item E24 to prompt TTW participants who responded that they had never heard of the TTW program. This item reminds respondents that, according to SSA, the sample person's Ticket was assigned to the particular EN (as of the date the sample frame was drawn).
SDate	Date sample frame drawn for TTW participants	Used as fill at Item E24 to prompt TTW participants who responded that they had never heard of the TTW program. This item reminds respondents that, according to SSA, the sample person's Ticket was assigned to an EN (as of the date the sample frame was drawn).
SSIage	Age at which sample member first received SSI benefits	Used to determine pathing at Items E11 and E12. Only respondents who received SSI before age 22 (and were 25-years-old or younger) received these items.
StateMed	State name for Medicaid based on state of residence reported at time of survey	Used at Item J2 to identify, by name, the Medicaid program in the respondent's state.
VRname	State name for State Vocational Rehabilitation Agency based on state of residence reported at time of survey	Used at Items B29, E28, E36b, E36c, F2, F6, F12, F20, F29, F31, H7, H12, and H21 and to identify, by name, the State Vocational Rehabilitation Agency in the respondent's state.
VRDate	Date Ticket assigned to State Vocational Rehabilitation Agency	Used at Item E36c to prompt respondents who say they have not received services from a State Vocational Rehabilitation Agency but who had a Ticket assigned to an SVRA based on SSA records.

Source: NBS, Round 4.

Finally, given that proxies are needed when the sample member's disability precludes participation, the instrument was programmed to fill in the proper pronoun or name in the question text after the interviewer indicated that the survey respondent would be either a sample member or a proxy. In addition, the instrument was programmed to skip attitudinal and opinion items for proxy respondents to minimize bias in reporting. (See Table III.3 for a complete list of items not asked of proxy respondents.) As mentioned previously, interviewers completed 931 proxy interviews.

Table III.3. Items Skipped for Proxy Respondents

Survey Item	Question Text
B29_3a	You said that one of the reasons you did not accept a job you were offered was because it did not pay enough. What is the lowest wage or salary you would have accepted for this job?
B29_3b	If you did get a job offer that matched your current needs and abilities, what is the lowest wage or salary you would be willing to accept for such a job?
B29_8a	You said that one of the reasons you are unable to find a job is that the jobs that are available do not pay enough. What is the lowest wage or salary you would accept for a job that matched your current needs and abilities?
B29_8b	If you did get a job offer that matched your needs and abilities, what is the lowest wage or salary you would be willing to accept for such a job?
B29_12a	If you did get a job offer that matched your current needs and abilities, what is the lowest wage or salary you would be willing to accept for such a job?
C18	Taking all things into account, how satisfied are you with your {main/current} job? Would you say very satisfied, somewhat satisfied, not very satisfied, or not at all satisfied?
C39a–C39l	Thinking about your {main/current} job, how much do you agree with each of the following statements? Would you say you strongly agree, agree, disagree, or strongly disagree?
C39a	The pay is good.
C39b	The benefits are good.
C39c	The {job security is good/work is steady}.
C39d	You have a chance for promotion.
C39e	You have a chance to develop abilities.
C39f	You have recognition or respect from others.
C39g	You can work on your own in your job if you want to.
C39h	You can work with others in a group or team if you want to.
C39i	Your work is interesting or enjoyable.
C39j	Your work gives you a feeling of accomplishment or contribution.
C39k	Your supervisor is supportive.
C39l	Your co-workers are friendly and supportive.
H10a–H10f	Now I'm going to read you some statements about the Ticket to Work program. For each statement, please tell me if it is something you knew before today or not. Is this something you knew before today or not:
H10a	Participation in the Ticket to Work program is voluntary, and you do not have to participate to keep your disability benefits.
H10b	You can, during any month, take back your Ticket and give it to another Employment Network or participating provider.
H10c	After the first year, you must work at certain levels to remain in the program.
H10d	While you are working, you can keep your Medicare and/or Medicaid benefits.
H10e	You can get services from your State Vocational Rehabilitation Agency without giving the agency your Ticket.
H10f	You can use your Ticket to get follow-up services somewhere else after you finish getting services from the State Vocational Rehabilitation Agency.
H11	Before you started participating, how much would you say you knew about the Ticket to Work program? Would you say a lot, some, a little, or nothing?

Table III.3 *(continued)*

Survey Item	Question Text
H45	Overall, how satisfied are you with the Ticket to Work program? Would you say very satisfied, somewhat satisfied, not very satisfied, or not at all satisfied?
H45_1a-H45_1g	Why are you not satisfied with the [Ticket to Work program/2009 EN]? Is it because:
H45_1a	The services you received were not a good fit for your needs?
H45_1b	The [Ticket to Work program/State Vocational Rehabilitation Agency] did not offer you enough services?
H45_1c	The services provided were not available at times that fit your schedule?
H45_1d	The services took too long to start?
H45_1e	The services were of poor quality?
H45_1f	Your medical condition or other personal circumstances kept you from fully participating in the services?
H45_1g	Are there other reasons you are not satisfied?
H58	How satisfied are you with how the problem (with the SVRA/EN) was solved? Would you say very satisfied, somewhat satisfied, not very satisfied, or not at all satisfied?

Source: NBS, Round 4.

C. Comparisons with Other Questionnaires and Surveys

The NBS contains a number of questions that are found on other survey instruments. In Table III.4, we list the names of the studies from which NBS questions have been drawn, their sponsors (where relevant), and the NBS question number. In some instances, several studies asked the same question, in which case we list all studies.

Table III.4. National Beneficiary Question Sources

Study/Source	Sponsor	Question Numbers
A National Study of Health and Activity (NSHA)	Social Security Administration (SSA)	B18, B19, B25a-k, B47a-d, C6, C8, C9, C11, C20a-i, C33a-f, D14, D16-D19, I19, I20, I23, I24, I31, I32, J1, J2, J4-J6, K7, K8a-h
Employment Intervention Demonstration Program (EIDP)	Center for Mental Health Services, Substance Abuse and Mental Health Services Administration (SAMHSA)	B47a-k
State Partnership Initiative Participant Employment Data Form	SSA	C20a-i
Project Network Baseline Survey	SSA	K7, K8a-h
Evaluation of the Effects of the 1996 Welfare Reform Legislation on Children with Disabilities	SSA	E3-10, E12, E13, E15-E19, E20a-d
1996 Survey of Income and Program Participation (SIPP) Wave 5 Functional Limitations and Disability Adult Topical Module	Demographic Survey Division, U.S. Census Bureau	I17, I18, I21, I22, I25, I26, I29, I30, I33-I39, I41, I43, I45-I52, I55-I61
Office of Management and Budget (OMB) Standards for Maintaining, Collecting and Presenting Federal Data on Race and Ethnicity		L1-L2

Source: NBS, Round 4.

D. Special Design Considerations

The NBS survey population represented a wide range of disabilities with varying degrees of severity; in addition, some sample members had several disabling conditions. While the survey could not be designed to overcome all possible challenges, the instrumentation procedures attempted to address three broad categories of common challenges: (1) communication, (2) stamina, and (3) cognitive barriers. Communication challenges include both hearing and speech impairments. Stamina challenges include physical and mental fatigue. Cognitive challenges include, but are not limited to, emotional disturbance, difficulty processing questions and responses, lack of complete or specific knowledge, and confusion about the purpose of the interview (Mitchell et al. 2004).

The NBS featured several techniques designed to overcome the above challenges. The interviews could be conducted via text typewriter, Telecommunications Relay Service, or instant messaging so that persons with severe hearing or speech impairments could be interviewed by telephone. In addition, to maximize survey participation, in-person interviewers obtained the services of sign language translators and made a range of other accommodations when interviewing persons with hearing impairments in their home.

The survey instrument included structured probes that both allowed questions to be rephrased and permitted concepts to be defined in a standard manner in the event that respondents required clarification or additional information. In addition, to minimize item nonresponse, the survey instrument included follow-up questions for continuous variables. For example, if a respondent could not provide an exact amount, a "Don't know" response was followed with a modified version of the question that offered response categories. The upper and lower bounds of each category were based on ranges specified by analysts. In general, we attempted to word survey questions simply, clearly, and briefly as well as in an unbiased manner so that respondents could readily understand key terms and concepts. Given the intent of the questions, response categories were appropriate, mutually exclusive, and reasonably exhaustive.

The introduction to the study notified all respondents that, if they began to tire during the interview, the interviewer could stop and resume the interview later. Interviewers were also trained to check with respondents about their level of fatigue during the interview. If they sensed that a respondent was tiring, they repeated this and asked the respondent if he or she was OK to continue. The instrument was set up so that the interview could be broken off at any time and a call-back time scheduled. In Round 4, some 885 interviews (about 11 percent of the total sample) were broken off after the interview began (that is, after the screener and cognitive items had been administered and the respondent was in the body of the questionnaire). Of these, 678 cases were later completed (77 percent); 207 were not completed (23 percent).

E. Changes Made to Survey Instrument at Round 4

As noted below, Mathematica made some modifications to the survey instrument in Round 4 to update it for administration in 2010, including (1) a change in reference periods from 2005 to 2009, (2) revisions to accommodate the change in sample design (3) revisions to items about awareness of work incentive programs to address recent changes in Federal programs, (4) the addition of items to gather in-depth data from respondents who reported that they either did not receive services in 2009 or were dissatisfied with the services they received, and (5) the addition of pre-defined response categories to some open-ended items. In addition, we deleted items no longer relevant.

1. Changes to Reference Periods

Questions that referred to calendar year 2005 during Round 3 were changed to 2009. The affected items included those asking about jobs held in 2009, Ticket use in 2009, services received in 2009, TTW participation in 2009, and insurance coverage in 2009. In a few cases, response categories were edited to reflect the new data collection period.

2. Changes Made to Accommodate New Sample Design

Given that we did not re-interview Ticket participants as part of the longitudinal sample[20] in Round 4, we removed all pathing, question text, and references to preloaded data from earlier rounds specific to longitudinal survey participation. To address changes to the TTW program related to Partnership Plus, which allows Ticket participants to assign their Ticket to an EN even if they currently receive services from a SVRA, we added a sample group variable to distinguish traditional SVRA "in-use" providers from ENs or SVRAs acting as ENs and then added items in Section E in order to obtain detail about services received from SVRAs for in-use participants. If participants had heard of TTW and were receiving services from in-use SVRAs, they then answered questions in Section F about why they did not assign their Ticket to an EN (with the exception of Items F11 through F19) and questions in Section H about program experiences (with the exception of Items H1 through H34). Appendix C summarizes the revisions.

3. Revisions to Items About Awareness of Work Incentive Programs to Address Recent Changes in Federal Programs

Throughout the survey, references to Benefit Planning and Assistance Organizations (BPAO) were changed to Work Incentive Planning and Assistance (WIPA). We also added questions about knowledge and use of Protection and Advocacy for Beneficiaries of Social Security (PABSS). To ensure that beneficiaries with Tickets assigned to an SVRA answered questions about their awareness of TTW, we added an item to remind such participants that SSA records indicated that their Ticket was assigned to an SVRA if they said they had never received services from an SVRA.

4. Addition of Items

Follow-up questions were added to Section G for beneficiaries who reported that the services they received in 2009 were not useful. For TTW participants aware of their TTW status and not reporting the receipt of services during 2009, we added a probe to verify that they received no services from a TTW provider. If participants verified that they received no services, we asked why not. To determine why services were not helpful, follow-up questions were also added to Section H for beneficiaries who reported that they were dissatisfied with the services they received, that the services they received did not help them secure or retain a job, or that the services they received did not help them reach their work goals. Appendix C includes a list of items added in Round 4.

[20] It was theoretically possible for a sample member selected in Round 4 to have been selected in earlier rounds. With the same PSUs used in previous rounds, the likelihood of earlier selection was not negligible. In fact, it occurred for a handful of cases in Round 4.

5. Changes to Response Categories

During the coding of the Round 3 open-ended items, we identified responses commonly given to questions eliciting a verbatim answer. In some cases, we revised the responses or added them to the survey item as pre-defined response options (Table (III.5)).

Table III.5. Response Options Added to Survey Items in Round 4

Survey Item	Response Option Added
B39. Who do you discuss your work goals with most?	"Other Non-Relative" was added
B42. Who else do you discuss your work goals with?	"Other Non-Relative" was added
B45. Who else do you discuss your work goals with?	"Other Non-Relative" was added
C23. What kind of special equipment do you use?	"Hearing aid/device," "Special glasses," "Special chair/back support," "Special shoes/stockings" were added
F29. After receiving information about ENs in your area, including the state VR agency, why didn't you contact any of them?	"Got a job or in school" was added
G55. Who pressured you to use these services?	"Health care professional" and "Court/police" added
G56. How did {person from Item G55} pressure you to use these services?	"Threatened Hospitalization or Jail" added
H31. Why didn't any of the other ENs you tried to use your Ticket with accept your Ticket in 2009?	"Trouble Contacting EN" was added
I20. What devices, equipment, or other types of assistance do you use? Anything else?	"Magnifying Glass" was added
J11. Now I'd like you to think back to 2009. In 2009, what health coverage did you have?	"Private Insurance, Not Specified Who Through" was added
M2a_rlsp. How are you related to {NAME}?	"Friend," "Caseworker/Caregiver/Payee," "Girlfriend/Boyfriend/Partner," "Guardian/Foster Parent/Step Parent," and "In-Law" were added
M13. How is the assistant/proxy related to {NAME}?	"Friend," "Caseworker/Caregiver/Payee," "Girlfriend/Boyfriend/Partner," "Guardian/Foster Parent/Step Parent," and "In-Law" were added

This page has been left blank for double-sided copying.

IV. DATA COLLECTION

The NBS was executed as a dual-mode survey. Initial attempts to interview respondents used computer-assisted telephone interviewing (CATI) followed by computer-assisted personal interviewing (CAPI) of nonrespondents. The NBS attempted CAPI interviews with respondents who requested an in- person interview, those needing an in-person interview to accommodate a disability, and those without a telephone or whose telephone number could not be located. If a sample person was not able to participate in the survey because of his or her disability, Mathematica sought a proxy respondent. If no proxy was available and an in-person interview was not possible, we classified the final status of the case as a nonresponse. Sample persons or proxies who requested an in-person interview and were eligible for field follow-up were held for the start of CAPI data collection.

CATI data collection began in April 2010.[21] In-person locating and interviewing of telephone nonrespondents and beneficiaries who requested an in-person interview began in August 2010 and continued, concurrent with CATI interviewing, through December 2010. In total, Mathematica completed 5,078 cases[22] (including 38 partially completed interviews)[23]—2,298 from the Representative Beneficiary Sample and 2,780 from the Ticket Participant Samples. Mathematica conducted a CATI pretest in December 2003 to test the programmed instrument prior to fielding the NBS and completed 74 pre-test interviews--32 with participants and 42 with nonparticipants. As a result of the pre-test, Mathematica identified the need for minor instrument changes and corrected programming problems before full-scale CATI interviewing began. Details of the pre-test are in the NBS Round 1 User's Guide (Wright et al. 2009).

A. Data Collection Procedures

1. Advance Contacts

To increase respondent trust and rapport before the start of data collection, Mathematic sent all sample members with a valid address an advance letter and a list of frequently asked questions and answers. Printed on SSA letterhead and signed by an SSA official, the advance letter identified SSA as the sponsor of the survey and Mathematica as the survey contractor, explained the purpose of the survey, offered assurances of confidentiality, described the voluntary nature of participation, and included a toll-free number, a TTY number, and an e-mail address for respondents' use in contacting Mathematica with questions or to complete the interview at their convenience. To encourage participation and show appreciation for respondents' participation, Mathematica offered a post-paid incentive payment of $10 to respondents who completed the survey. The advance letters

[21] Interviewing began approximately eight months after the sample was selected.

[22] Given that the clustered and unclustered samples of the Ticket Participant Sample were independent, it was possible for individuals to be chosen for both samples. It was also possible for a sample member to be chosen for both the Representative Beneficiary Sample and the Ticket Participant Sample. Interviews for duplicate cases were conducted only once but recorded twice (once for each sample). The counts above include the duplicates as separate cases.

[23] Partial interviews were considered as completed if responses were provided through Section H of the interview (or, if the respondent was not eligible to receive Section H, through Section G).

indicated that the interview could be conducted in the sample person's home if the respondent were unable to respond by telephone because of a disability.

In an additional effort to help establish the NBS's legitimacy, SSA posted information about the survey on the agency's web site and circulated information about the survey to SSA field offices and the SSA teleservice (800) center. Field offices and the SSA teleservice (800) center were sent the names of telephone and in-person interviewers involved in the NBS so that these individuals could be identified as legitimate contacts. If, upon receipt of the advance letter, disability beneficiaries contacted their local field office or called the SSA teleservice number with questions about the survey or its legitimacy, SSA staff could then assure beneficiaries of the study's legitimacy and encourage them to participate.

2. Interviewer Training

CATI interviewers participated in 14 hours of training over four sessions in April 2010. CAPI interviewers participated in 24 hours of training over three days. The training provided interviewers with the study's background and purpose, a question-by-question review of the instrument, contact protocols, refusal avoidance strategies, and a series of practice interviews. In addition, sensitivity training emphasized the importance of demonstrating patience, professionalism, and unconditional positive regard for respondents regardless of impairments. Trainers stressed that the greatest barriers faced by people with disabilities are often others' prejudgments and erroneous images of them. Interviewers learned how to use positive rather than patronizing language and were encouraged to focus on the individual first and the disability last.

To overcome stamina challenges, interviewers were trained to be aware of behaviors that might indicate that a respondent was too fatigued to continue the interview. If a respondent seemed tired, agitated, or distracted, for example, interviewers were encouraged to ask whether the respondent needed to take a break and schedule another time to continue the interview or to set appointments for times when the respondent was most alert. To ensure that interviewers could address cognitive challenges, the training focused on neutral, nondirected probing methods (repeating the question, repeating response categories, asking for more information, stressing generality, stressing subjectivity, and zeroing in) and using active listening skills and patience. Interviewers were instructed to provide neutral feedback and encouragement and to help keep the respondent free of distractions, to say the respondent's name often, and to avoid an exaggerated inflection or tone of voice.

As part of training interviewers on administering the cognitive assessment, we played nine pre-recorded mock screenings during the first day of training. Interviewers were asked to listen to the mock interviews and independently code the outcome. Interviewers' ratings were compared to an expert assessment and scored as "correct" or "incorrect". On the final day of training, after having discussed the screening process in greater detail and role playing several example interviews, we replayed the same mock interviews and asked interviewers to code the outcome to assess whether scores changed. The number of interviewers coding eight or more of the nine screening interviews correct improved markedly (76 versus 51 percent) after this exercise. Those who scored three or more screenings incorrectly, received additional one-on-one training on administration of the screener.

All Round 4 telephone interviews were digitally recorded, enabling us to perform an additional validation check approximately 4 weeks into data collection. For this, we randomly selected five cases in which a sample member had "passed" the cognitive screener and five cases in which the

sample member had "failed' the cognitive screener. Twenty five separate audio files were created from screener items selected from these cases (including both the interviewer's reading of the item and the sample person's response). The items selected were those an expert concluded had been coded correctly based on the sample person's response. The vast majority of interviewers (95 percent) coded the items with at least 80 percent accuracy. More than half of the interviewers coded with nearly 90 percent accuracy. None of the interviewers coded with less than 72 percent accuracy.

3. Locating

SSA provided sample members' contact information drawn from administrative records. Before the mailing of the advance materials, Mathematica verified or updated all addresses using a commercially available database. Over the course of Round 4 data collection, 63 percent of telephone numbers initially provided by SSA were determined to be invalid and submitted to central office locating. Mathematica used a variety of techniques for locating updated information, including database searches, calling relatives and friends, receiving updated contact information from SSA, and making in-person visits for field locating. Through these efforts, Mathematica eventually located approximately 70 percent of the sample for interviewing or determining ineligibility. Of the located sample, 59 percent completed the interview.

4. CATI Data Collection

CATI data collection began in April 2010. In total, Mathematica completed 3,936 cases by telephone (78 percent of completes). Sixty-seven percent of the Representative Beneficiary Sample completes (n = 1,537) and 86 percent of the Ticket Participant Sample completes (n = 2,399) were completed via CATI. Mathematica achieved approximately 52 percent of total completes before the start of CAPI data collection (August 2010). On average, the telephone survey took 54 minutes to administer, with the interview length ranging from 19 to 180 minutes.

Assistive technologies. Several technologies were available to assist with telephone interviewing of sample persons who were deaf or hard-of-hearing, including telephone amplifying volume controls, an in-house TTY machine, telephone or video TRS, and instant messaging. To minimize respondent burden when using TTY, TRS, and instant messaging, a Word version of the instrument included standard TTY abbreviations and punctuation (such as "ga" [go ahead], "nu" [number], "oic" [oh, I see]), which interviewers could use to "cut" the question text from the electronic file and "paste" into the TTY text box or instant messaging screen to ask a question. Interviewers then entered respondents' answers into the computerized survey instrument on a second PC. Nonetheless, the average length of a TTY or TRS interview was considerably longer than that of a non–TTY/TRS interview. For Round 4 of the NBS, the average time to complete a TTY/TRS interview was 80 minutes. The shortest TTY interview lasted about 18 minutes; the longest was 2.5 hours over several sessions.

For Round 4, we identified 142 respondents who were hearing impaired and could potentially be interviewed using TTY, TRS, or instant messaging. In 56 cases, the sample member completed the interview: one by TTY, 22 by telephone or video TRS, 16 using a sign language interpreter or other assistance, and 17 with an in-person interviewer. Proxies completed an additional 24 cases. The remainder either did not answer the call or refused an interview, usually citing length of the interview as the reason for refusal.

5. CAPI Data Collection

In-person survey administration can maximize the number of responses among persons with disabilities by facilitating interviews of persons with hearing and speech limitations who are unable to participate by telephone, permitting persons with cognitive challenges to benefit from in-person assistance, and improving the locating rate through in-field searching (Mitchell et al. 2004). To control costs, Mathematica first attempted to contact and interview sample persons via telephone and, if needed, conducted CAPI follow-ups with beneficiaries who either requested an in-person interview or required an in-person interview to accommodate a disability (provided they were part of the clustered sample and thus eligible for in-person interviewing).

Cases referred for in-person interviewing (refusals, sample members resistant to telephone attempts, and sample members requesting an in-person interview) went first to central office locating. Additionally, cases for which a telephone number could not be located were flagged for CAPI follow-up. It was the job of central office locating to verify or update, if needed, sample members' telephone number and address and compile a list of previous addresses before assigning cases to field interviewers. As discussed in Chapter II, the unlocated, unclustered outcome-only Ticket Participant Sample was not eligible for CAPI field treatment. For the purpose of data collection, clustered and unclustered cases were subjected to identical predetermined central office locating procedures. Once central office locating was exhausted, clustered cases were sent to the field for in-person locating and unclustered cases were put on hold and received no further locating treatment. In all, 354 cases were statused as unclustered unlocated at the end of data collection. See Figure IV.1 for a summary of the CAPI Ticket Participant Sample administration procedures.

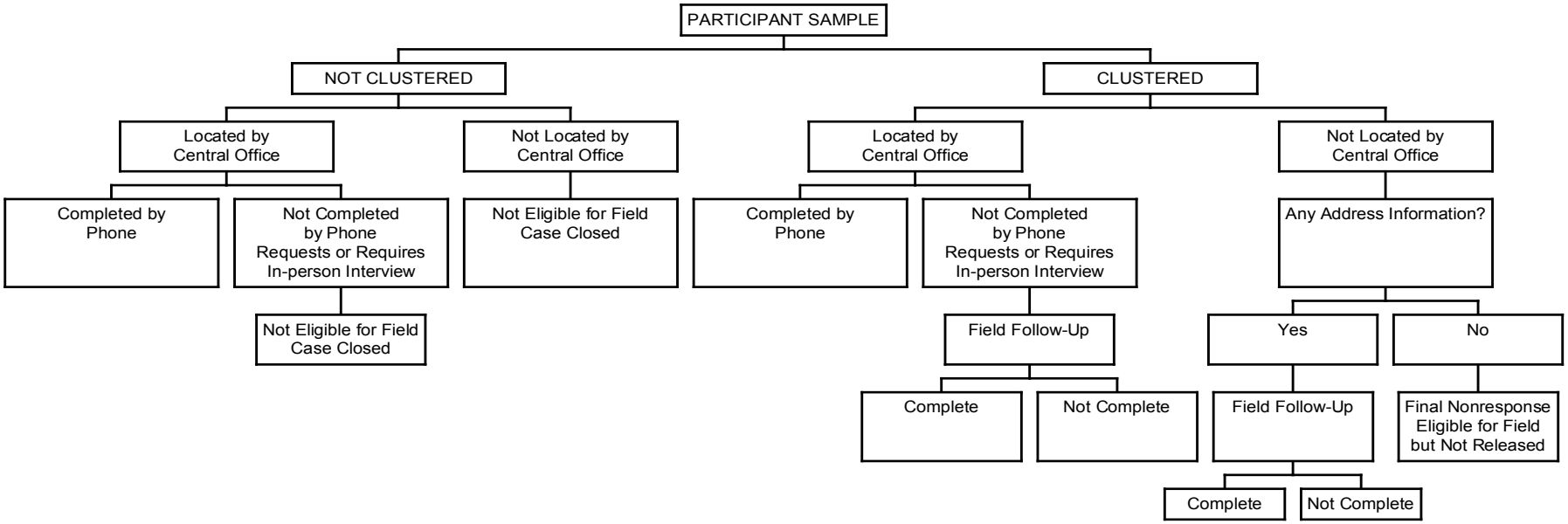
In all, 2,553 cases, or approximately 32 percent of the total sample, were sent to in-person interviewers. Of these, 53 percent were completed; 188 (7 percent) by CATI and 1,142 (45 percent) by field interviewers. To save on data collection costs, field interviewers were trained to encourage sample persons to call in and complete the survey by telephone once they were located. Thirty-three percent of the Representative Beneficiary Sample (n = 761) and 14 percent of the Ticket Participant Sample (n = 381) were completed via CAPI.

More than half (59 percent) of the cases sent to the field could not be located or lacked a telephone number while 24 percent of the cases were sent to the field because the sample ember initially refused a CATI interview. An additional 15 percent were sent to the field because they were difficult to contact by telephone or had evaded contact efforts. The remaining two percent of cases sent to the field represented sample members requesting an in-person interview.

To ensure collection of the highest-quality CAPI data, Mathematica put in place several Quality Assurance (QA) procedures. First, we reviewed early CAPI data for the frequency of item nonresponse and other data problems. Using such information, we provided feedback and additional instruction to interviewers as needed. Second, we checked interview length for patterns of especially long or short interviews; such interviews might indicate data forgery or other problems. Finally, we randomly selected 10 percent of each interviewer's cases and verified them by either telephone or mail. During verification, we asked respondents about the length of the interview, whether the interviewer used a laptop, and the types of questions asked. In addition, we re-asked some questions to ensure that the answers matched those recorded during the interview.

FIGURE IV.1

NATIONAL BENEFICIARY SURVEY - SAMPLE ADMINISTRATION



6. Assisted Interviews and Proxy Respondents

To increase opportunities for self-response, we permitted "assisted" interviews, which differed from proxy interviews in that beneficiaries answered most questions themselves. The assistant, typically a family member, provided encouragement, interpretation, and verified answers as needed. Assisted interviews minimized item nonresponse, improved response accuracy, and overcame some limiting conditions (such as difficulties with hearing) and language barriers. In all, 234 assisted interviews were conducted (approximately 5 percent of all completes) during Round 4.

As a last resort, we relied on proxy respondents to complete the survey on behalf of respondents who could not complete the survey themselves (even with assistance) either by telephone or in-person. This included sample persons with severe communication impairments, those with severe physical disabilities that precluded participation (in any mode), and those with mental impairments that might have compromised data quality. We strongly preferred reliance on a beneficiary rather than on a proxy when possible because sample members generally provide more complete and accurate information than do proxy respondents. However, allowing the use of proxies when necessary minimized the risk of nonresponse bias that would have resulted from the exclusion of individuals with severe physical or cognitive impairments.

To identify the need for proxy respondents, we administered an innovative mini-cognitive test designed expressly for the NBS.[24] The test provided interviewers with a tool for determining when to seek a proxy rather than leaving the decision to interviewer discretion or a gatekeeper. The test, which included three questions at the start of the interview, combined the ability to understand the survey topics with elements of informed consent. First, we gave a general description of the survey topics to be covered (your health, daily activities, and any jobs you might have) and asked the respondent to state the topics in his or her own words. Second, we described the voluntary nature of the survey and asked respondents to state, in their own words, what that description meant to them. Third, we described the confidential nature of the respondents' answers and asked them to state what that description meant. If respondents were unable to restate accurately any description after two attempts, we asked if someone else could answer questions on their behalf.

In some cases, a knowledgeable informant expressed that a proxy would be necessary before the cognitive screener could be administered to the sample person. In these cases we relied on several guidelines to determine whether a proxy was indeed warranted. These guidelines included using proxies only when the sample member's physical or mental condition precluded self-response, selecting the most knowledgeable proxy, and ensuring that the proxy answered on behalf of the sampled respondent rather than offering his or her own opinions. Interviewers were trained to overcome gatekeepers' objections, and to give sample members the opportunity to speak for themselves whenever possible.

In Round 4, we completed proxy interviews for 998 sample members (20 percent of all completes). In approximately 83 percent of proxy cases, the sample member failed the cognitive assessment or was otherwise deemed unable to respond due to a cognitive or mental impairment. Nearly 75 percent of the time (n=744), the need for a proxy was determined prior to administration

[24] Westat designed the test as part of the design of the Ticket to Work evaluation; Mathematica modified it after pre-testing.

of the cognitive screener based on discussions with a knowledgeable informant. In approximately twenty-two percent of cases, a proxy was requested because the sample member failed the cognitive screener (n=222). In a small number of cases, the interviewer switched to a proxy after the sample member successfully completed the cognitive screener and had started the interview when it became apparent that the sample member could not answer the survey questions (n=32). In 152 cases, the sample member was unable to participate, and a proxy could not be identified. In approximately 60 percent of these cases, the sample member was unable to participate because they were unable to successfully complete the cognitive screener and approximately 35 percent were unable to participate based on gatekeeper report of limitation.

B. Case Disposition Summaries

A total of 2,298 cases from the Representative Beneficiary Sample and 2,780 cases from the Ticket Participant Sample were completed; 222 beneficiaries and 77 TTW participants were determined to be ineligible for the survey. Ineligible cases included sample persons who were deceased, no longer living in the continental United States, who were incarcerated, or who were denied benefits since the time of sample selection or who had never received SSA benefits. In Table IV.1, we summarize the final case disposition for all released cases in the cross-sectional sample by sampling strata.

Table IV.1. Summary Case Disposition by Sample Type and Sampling Strata

		Complete			Ineligible			Refused			Unlocated			Non-Respondents		
	Total Sample	Count	Un-weighted Percent	Weighted Percent	Count	Un-weighted Percent	Weighted Percent	Count	Un-weighted Percent	Weighted Percent	Count	Un-weighted Percent	Weighted Percent	Count	Un-weighted Percent	Weighted Percent
Representative Beneficiary Sample																
AGE 18-29	1,029	634	61.6	63.6	71	6.9	6.6	109	10.6	9.8	108	10.5	10.0	107	10.4	10.0
AGE 30-39	1,032	625	60.6	62.3	54	5.2	5.0	115	11.1	10.6	120	11.6	11.5	118	11.4	10.7
AGE 40-49	1,019	643	63.1	65.3	56	5.5	5.2	122	12.0	11.2	78	7.7	7.3	120	11.8	11.0
AGE 50+	603	396	65.7	68.7	41	6.8	6.5	79	13.1	11.9	32	5.3	5.0	55	9.1	7.9
Total Beneficiary Sample	3,683	2,298	62.4	66.8	222	6.0	6.1	425	11.5	11.4	338	9.2	6.7	400	10.9	9.1
Ticket Participant Sample																
SVRA EN	1,094	678	62.0	68.2	15	1.4	1.3	118	10.9	11.3	49	4.5	9.6	234	21.3	9.6
NON-SVRA EN	2,157	1,352	62.7	69.4	47	2.2	2.1	237	11.0	11.3	115	5.3	6.7	406	18.8	10.5
TRADITIONAL	1,083	750	69.3	70.1	15	1.4	1.3	140	12.9	12.6	74	6.8	6.7	104	9.6	9.2
Total Participant Sample	4,334	2,780	64.1	69.9	77	1.8	1.4	495	11.4	12.4	238	5.5	6.9	744	17.2	9.4
Combined Sample																
Total Sample**	8,017	5,078	63.3	66.8	299	3.7	6.0	920	11.5	11.4	576	7.2	6.7	1144	14.3	9.1

Source: NBS, Round 4.

Note: The number of completed cases includes 38 partially completed interviews: 20 in the Ticket Participant Sample and 18 in the Representative Beneficiary Sample. The number of non-respondents includes 354 cases statused as unclustered unlocated in the Ticket Participant Sample.

**The weighted percentages may be calculated as a weighted average of the Representative Beneficiary and Ticket Participant samples. The average is dominated by the percentages from the Representative Beneficiary Sample.

V. VARIABLE CONSTRUCTION AND EDITING

The NBS data files contain several types of variables: unedited and edited questionnaire variables, imputed variables and imputation flags, coded verbatim responses, variables masked for the Public Use File, constructed variables derived from questionnaire variables, weights, survey administration variables, and SSA administrative data.[25] In this chapter, we provide an overview of the types of variables in both the Restricted Access and Public Use data files and variable naming conventions as well as additional details on coded items and select constructed variables.

A. Editing of Questionnaire Variables

Questionnaire variables are survey items collected directly from the respondent. On the NBS data files, these variables are distinguished by a two-part name with the first part of the variable name representing the section of the questionnaire where the question originates and the second part of the variable name representing the numerical question from the questionnaire (for example, question F11 comes from Section F of the questionnaire and is question 11). Variables on the data file are also preceded by an R4_ to identify them as Round 4 variables.

We thoroughly reviewed the NBS data for discrepancies that might have resulted from programming or interviewer errors. We performed the necessary editing to resolve any inconsistencies in skip patterns and to review and resolve some outlier values by recoding either to an appropriate valid value or a value of missing (.D = don't know). For key variables, we imputed these responses and other missing values. In consultation with SSA and research analysts, we took the general approach of editing only those cases where there appeared to be an obvious data entry or respondent error. As a result, while we devoted substantial time to a meticulous review of individual responses, some suspect values remain in the file. The "National Beneficiary Survey: Round 4 Data Cleaning and Identification of Data Problems Report" (Barrett et al. 2012) provides more information on data problems and the completeness of the survey data set.

B. Imputation of Missing Values

A case may be missing data for a particular item because of a logical skip (the respondent was ineligible for the item), the respondent refused the item or responded "Don't know," an interviewer or programming error resulted in a loss of data, or the case was a partial complete and is missing data for some items. Data for cases completed up through H61 (or G61 if the respondent was not eligible for Section H) were included on the file as partial completes. All subsequent items for these cases were coded as .P. In Table V.1, we summarize missing value codes and their description. For selected variables in the file, we imputed missing data due to "Don't know" or refused responses and those missing because the case was partially completed (.D, .R, and .P).

[25] In general, unedited variables are those which contain the original response to a single questionnaire item.

Table V.1. Missing Values and Description

Value	Description
L	Logical skip: Respondent not eligible to receive the item
D	Don't know: Respondent did not know how to answer the item
R	Refused: Respondent refused to respond to the item
M	Missing data: Data are missing due to interviewer or programming error
P	Partial complete: Data are missing due to partial interview

Source: NBS, Round 4.

We selected variables for imputation based on their level of missing data and their analytic importance. Imputed variables include those related to race and ethnicity, disability status, current employment, health, income, and personal and household characteristics. In Chapter VII, we provide a complete list of variables selected for imputation and the specific imputation procedures used for each item. Imputed variables share the same name as the original variable but end in an _i. The original non-imputed variables are retained on the Restricted Access File, along with imputation flags indicating that a case was imputed and a description of the method of imputation (Table V.2). Imputation flag variables share the same name as the original variable and end in _iflag (for example, BMI_cat_i is the imputed version of the constructed variable C_BMI. BMI_cat_iflag, which indicates which cases were imputed and the method used for that imputation).

Table V.2. Imputation Flag Values and Description

Imputation Flag Value	Description
0	No change
1	Logical imputation
2	Administrative data
3	Hot-deck imputation
4	Imputed by distributional assumptions
5	Imputed by descriptive statistic
6	Constructed from imputed variables
7	Longitudinal imputation
L	Logical skip
P	Partial

Source: NBS, Round 4.

C. Coding of Verbatim Responses

The NBS questionnaire includes a number of questions designed to elicit open-ended responses. To make it easier to use the data connected with these responses in an analysis, we grouped the responses and, when possible, assigned them numeric codes. The methodology used to code each variable depended upon the content of the variable. Three kinds of questions (described below) on the NBS did not have designated response categories; rather, the response to these questions was recorded verbatim:

1. **Open-ended questions** have no response options specified (such as E43—"Why are you no longer receiving services from your employment network?"). For these items, interviewers recorded the verbatim response. Using common responses, we developed categories and reviewed them with analysts. Coders then attempted to code the verbatim response into an established category. If the response did not fit into one of these categories, it was coded as "other."
2. **"Other/specify"** is a response option for questions that have a finite number of possible answers that may not necessarily capture all possible responses. A good example is: "Did you do anything else to look for work in the last four weeks that I didn't mention?" For questions of this type, respondents were asked to specify an answer to the question "anything else?" or "anyone else?"
3. **Field-coded responses** are answers coded by interviewers into a pre-defined response category without reading the categories aloud to the respondent. If none of the response options seemed to apply, interviewers selected an "other specify" category and typed in the response.

As part of data processing in prior rounds, we examined a portion of all verbatim responses in an attempt to uncover dominant themes for each question. Based on this initial review, we developed a list of categories and decision rules for coding verbatim responses to open-ended items. In addition, we added supplemental response categories to some field-coded or other/specify items to facilitate coding if enough such responses could not be back-coded into pre-existing categories. (In Appendix D, we list all open-ended items assigned additional categories during the coding process.) Thus, we categorized verbatim responses for quantitative analyses by coding responses that clustered together (for open-ended and "other/specify" responses) or by back-coding responses into existing response options if appropriate (for "field-coded" and "other/specify" items). Categories developed during Round 1, 2, and 3 coding were applied in Round 4. We added a new category—health insurance unspecified—to four items in Round 4. In some cases, we added to the categories developed in earlier rounds to minimize back-coding. If, during coding, it became apparent that changes to the coding scheme were needed (for example, the addition of more categories or the clarification of coding decisions), we discussed and documented new decision rules. Verbatim responses were sorted alphabetically by item for coders and could be filtered by coding status so that new decision rules could be easily applied to cases that had been previously coded. When it was impossible to code a response, when responses were invalid, or when they could not be coded into a given category, we assigned a two-digit supplemental code to the response (see Table V.3). The data files do not include the verbatim responses. Barrett et al. (2012) provide full details on back-coding procedures.

Table V.3. Supplemental Codes for Other/Specify Coding

Code	Label	Description
94	Invalid response	Indicates that response should not be counted as an "other" response and should be deleted
95	Refused	Used only if verbatim response indicates respondent refused to answer question
96	Duplicate response	Indicates that verbatim response already has been selected in a "code all that apply" item
98	Don't know	Used only if verbatim indicates that respondent does not know answer
99	Not codeable	Indicates that a code cannot be assigned based on verbatim response

Source: NBS, Round 4.

1. Health Condition Coding

Responses to questions on health conditions required a specific type of open-ended coding. Section B of the questionnaire asked each respondent to cite the main and secondary physical or mental conditions that limit the kind or amount of work or daily activities he or she can do. Main conditions could be reported as one of four items: B2 (main reason limited), B6 (main reason eligible for benefits), B12 (main reason was eligible for benefits if not currently eligible), and B15 (main reason limited when first started getting disability benefits). The main purpose of items B6, B12, and B15 was to collect information on a health condition from people who reported no limiting conditions in B2. For example, if respondents said that they had no limiting conditions, they were asked if they were currently receiving benefits from Social Security. If they answered "yes," they were asked for the main reason that made them eligible for benefits (B6). If respondents said that they were not currently receiving benefits, they were asked whether they had received disability benefits in the last five years. If they answered "yes," they were asked for the condition that made them eligible for Social Security benefits (B12) or for the reason that first made them eligible if they no longer had that condition (B15). If respondents said that they had not received disability benefits in the last five years, they were screened out of the survey and coded as ineligible. We assigned to each response to B2, B6, B12, and B15 a value for the three health condition constructs. Although B2, B6, B12, or B15 asked respondents to cite one "main" condition, many respondents listed more than one. The additional responses were maintained under the main condition variable and coded in the order in which they were recorded.

For each item on a main condition, respondents were also asked to list any other, or secondary, conditions. For example, respondents reporting a main condition at B2 were asked at B4 to list other conditions that limited the kind or amount of work or daily activities they could do. Respondents reporting the main reason they were eligible for disability benefits (at B6) were asked at B8 to list other conditions that made them eligible. Finally, respondents who reported that they were not currently receiving benefits and who reported a main condition at B12 (the condition that made them eligible to receive disability benefits in the last five years) were asked at B14 for other reasons that made them eligible for benefits. Those who reported that their current main condition was not the condition that made them eligible for benefits, and who were asked for the main reason they were first limited, were also asked if there were any other conditions that had limited them when they first started receiving benefits (B17).

As in previous rounds, the respondents' verbatim responses were coded according to the International Classification of Diseases, 9th revision, Clinical Modification (ICD-9-CM) five-digit coding scheme. The ICD-9 is a classification of morbidity and mortality information that was developed in 1950 to index hospital records by disease for data storage and retrieval. The ICD-9 was available in hard copy for each of the coders. Coders, many of whom had previous medical coding experience, attended an eight-hour training session before coding, and were instructed to code to the highest possible level of specificity. Responses not specific enough for a five-digit code were coded to four (subcategory) or three digits (category codes). Responses not specific enough for even three- or four-digit ICD-9 codes were coded either as a physical problem (not specified) or to broader categories representing disease groups. (See Table V.4 for a list of the broad categorical and supplementary codes.) When respondents provided several distinct conditions, we coded all conditions (for instance, three distinct conditions would be recorded and coded as B2_1, B2_2, and B2_3).

Table V.4. Body System Diagnosis Groups (C_MAINCONBODYGROUP_1- _9, C_SECCONBODYGROUP_1- _9, C_REASBECELIGBODYGROUP)

Code	Label	Description of ICD-9 Codes	Corresponding ICD-9 Codes
00	Other	Other and unspecified infectious and parasitic disease; alcohol dependence syndrome and drug dependence; learning disorders and developmental speech or language disorders; complications of medical care, not elsewhere classified	136.0-136.9, 303.00-304.90, 315.00-315.39, 999.0-999.9
01	Infectious and parasitic diseases	Borne by a bacterium or parasite and viruses that can be passed from one human to another or from an animal/insect to a human, including tuberculosis, HIV, other viral diseases, and venereal diseases (excluding other and unspecified infectious and parasitic diseases)	001.0-135, 137.0-139.8
02	Neoplasms	New abnormal growth of tissue, i.e., tumors and cancer, including malignant neoplasms, carcinoma in situ, and neoplasm of uncertain behavior	140.0–239.9
03	Endocrine/nutritional disorders	Thyroid disorders, diabetes, abnormal growth disorders, nutritional disorders, and other metabolic and immunity disorders	240.0–279.9
04	Blood/blood-forming	Diseases of blood cells and spleen	280.0–289.9
05	Mental disorders	Psychoses, neurotic and personality disorders, and other non-psychotic mental disorders, including mental retardation (excluding alcohol and drug dependence and learning, developmental, speech, or language disorders)	290.0–302.9, 305.00-314.9, 315.4-319
06	Diseases of nervous system	Disorders of brain, spinal cord, central nervous system, peripheral nervous system, and senses including paralytic syndromes, and disorders of eye and ear	320.0-389.9
07	Diseases of circulatory system	Heart disease, disorders of circulation, and diseases of arteries, veins, and capillaries	390-459.9
08	Diseases of respiratory system	Disorders of the nasal, sinus, upper respiratory tract, and lungs including chronic obstructive pulmonary disease	460-519.9
09	Diseases of digestive system	Diseases of the oral cavity, stomach, esophagus, and duodenum	520.0-579.9
10	Diseases of genitourinary system	Diseases of the kidneys, urinary system, genital organs, and breasts	580.0-629.9
11	Complications of pregnancy, child birth, and the puerperium	Complications related to pregnancy or delivery, and complications of the puerperium	630-677
12	Diseases of skin/ subcutaneous tissue	Infections of the skin, inflammatory conditions, and other skin diseases	680.0-709.9
13	Diseases of musculoskeletal system	Muscle, bone, and joint problems, including arthropathies, dorsopathies, rheumatism, osteopathies, and acquired musculoskeletal deformities	710.0-739.9

Table V.4 *(continued)*

Code	Label	Description of ICD-9 Codes	Corresponding ICD-9 Codes
14	Congenital anomalies	Problems arising from abnormal fetal development, including birth defects and genetic abnormalities	740.0-759.9
15	Conditions in the perinatal period	Conditions that have origin in birth period even if disorder emerges later	760.0-779.9
16	Symptoms, signs, and ill-defined conditions	Ill-defined conditions and symptoms; used when no more specific diagnosis can be made	780.01-799.9
17	Injury and poisoning	Problems that result from accidents and injuries including fractures, brain injury, and burns (excluding complications of medical care not elsewhere classified)	800.00–998.9
18	Physical problem, NEC	The condition is physical, but no more specific code can be assigned.	No ICD-9 codes
95	Refused	Verbatim indicates respondent refused to answer the question.	No ICD-9 codes
96	Duplicate condition reported	The condition has already been coded for the respondent.	No ICD-9 codes
97	No condition reported	The verbatim does not contain or symptom to condition to code.	No ICD-9 codes
98	Don't know	The respondent reports that he/she does not know the condition.	No ICD-9 codes
99	Uncodeable	A code cannot be assigned based on the verbatim response.	No ICD-9 codes

Source: NBS, Round 4.

We used several approaches to ensure that responses were coded according to protocol. First, we performed an initial quality assurance check, per coder, for the first several cases that were coded. In addition, during coding, we randomly selected 10 percent of responses for review. In total, a supervisor reviewed approximately 16 percent of all coded responses, including cases that coders flagged for review because they were unable or did not know how to code them. Approximately 17 percent of all cases required recoding. Further, in the course of the quality assurance check, we developed additional decision rules to clarify and document the coding protocol. We discussed the decisions with coders and posted the decisions to ensure consistent and accurate coding throughout the coding process. Finally, as for other open-ended items, when we added decision rules, we reviewed previously coded responses and re-coded them if necessary.

After completion of the ICD-9 coding, we processed the health condition variables into a series of constructed variables that grouped health conditions into broad disease groups. In addition to the body system classifications represented in Table V.4 (C_MAINCONBODYGROUP_1-_9, C_SECCONBODYGROUP_1-_9), we formed primary diagnosis groups with separate categories for HIV/AIDS, schizophrenia, major affective disorders, mental retardation, visual impairments, hearing impairments, and speech disorders (C_MAINCONDIAGGRP_1-_9, C_SECCOND-IAGGRP_1-_9; see Table V.5 for codes). Additional constructs collapsed the categories into four broad groups for the Public Use File (C_MAINCONCOLDIAGGRP_1-_9, C_SECCONCOLDIAGGRP_1-_9; see Table V.6 for codes). We also created a set of separate constructs to summarize responses in B6, B12, and B15 (C_REASBECELIGICD9,

C_REASBECELIGDIAGGRP, C_REASBECELIGCOLDIAGGRP, and C_REASBECELIG-BODYGROUP). These constructs clarify the eligibility of sample members who indicate at B1 and B2 that they do not have a disabling condition.

Table V.5. Primary Diagnosis Groups (C_MAINCONDIAGGRP_1- _9, C_SECCONDIAGGRP_1- _9, C_REASBECELIGDIAGGRP)

Code	Label	Description of ICD-9 Codes	Corresponding ICD-9 Codes
00	Other	Other and unspecified infectious and parasitic disease; alcohol dependence syndrome and drug dependence; learning disorders and developmental speech or language disorders; complications of pregnancy, childbirth and the puerperium; conditions in the perinatal period; symptoms, signs and ill-defined conditions; complications of medical care, not elsewhere classified; physical problems not elsewhere classified.	136.0-136.9, 303.00-304.93, 315.00-315.39, 630-677, 760.0–779.9, 780.01-784.2, 784.60-799.99, 999.0-999.9, 11,15, 16, 18
01	Infectious and parasitic Diseases	Borne by a bacterium or parasite and viruses that can be passed from one human to another or from an animal/insect to a human, including tuberculosis, other viral diseases, and venereal diseases (excluding HIV and other and unspecified infectious and parasitic diseases)	001.0-041.9, 045.00-135, 137.0-139.8, 01
02	HIV/AIDS	HIV infection	042
03	Neoplasms	New abnormal growth of tissue, i.e., tumors and cancer, including malignant neoplasms, carcinoma in situ, and neoplasm of uncertain behavior	140.0–239.9, 02
04	Endocrine/nutritional disorders	Thyroid disorders, diabetes, abnormal growth disorders, nutritional disorders, and other metabolic and immunity disorders	240.0–279.9, 03
05	Blood/ blood-forming diseases	Diseases of blood cells and spleen	280.0–289.9, 04
06	Schizophrenia/ psychoses	Schizophrenic disorders	295.00-295.95
07	Major affective disorders	Affective psychoses including major depression and bipolar disorder	296.00-296.99
08	Other mental disorders	Organic psychotic conditions, paranoid states, neurotic disorders, personality disorders, and other non-psychotic mental disorders (excluding alcohol and drug dependence and learning /developmental speech or language disorders, schizophrenia, and major affective disorders)	290.0–294.9, 297.0-302.9, 305.00-314.9, 315.4-316, 05
09	Mental retardation	Mild mental retardation and other specified and unspecified mental retardation	317-319
10	Visual impairment	Disorders of the eye and adnexa	360.00-379.99
11	Hearing impairment	Disorders of the ear and mastoid process	380.00-389.9
12	Speech impairment	Asphasia, voice disturbance, other speech disturbance	784.3-784.5

Table V.5 *(continued)*

Code	Label	Description of ICD-9 Codes	Corresponding ICD-9 Codes
13	Other diseases of nervous system	Disorders of brain, spinal cord, central nervous system, peripheral nervous system, and senses, including paralytic syndromes, excluding disorders of eye and disorders of ear	320.0-359.9, 06
14	Diseases of circulatory system	Heart disease, disorders of circulation, and diseases of arteries, veins, and capillaries	390-459.9, 07
15	Diseases of respiratory system	Disorders of the nasal, sinus, upper respiratory tract, and lungs including chronic obstructive pulmonary disease	460-519.9, 08
16	Diseases of digestive system	Diseases of the oral cavity, stomach, esophagus, and duodenum	520.0-579.9, 09
17	Diseases of genitourinary system	Diseases of the kidneys, urinary system, genital organs, and breasts	580.0-629.9, 10
18	Diseases of skin/ subcutaneous tissue	Infections of the skin, inflammatory conditions, and other skin diseases	680.0-709.9, 12
19	Diseases of musculoskeletal system	Muscle, bone, and joint problems including arthropathies, dorsopathies, rheumatism, osteopathies, and acquired musculoskeletal deformities	710.0-739.9, 13
20	Congenital anomalies	Problems arising from abnormal fetal development, including birth defects and genetic abnormalities	740.0-759.9, 14
21	Injury and poisoning	Problems that result from accidents and injuries including fractures, brain injury, and burns (excluding complications of medical care not elsewhere classified)	800.00–998.9, 17
95	Refused	Verbatim indicates respondent refused to answer the question.	No ICD-9 codes
96	Duplicate condition reported	The condition has already been coded for the respondent.	No ICD-9 codes
97	No condition reported	The verbatim does not contain symptom or condition to code.	No ICD-9 codes
98	Don't know	The respondent reports that he/she does not know the condition.	No ICD-9 codes
99	Uncodeable	A code cannot be assigned based on the verbatim response.	No ICD-9 codes

Source: NBS, Round 4.

Table V.6. Primary Diagnosis Codes Collapsed (C_MAINCONCOLDIAGGRP_1- _9, C_SECCONCOLDIAGGRP_1- _9, C_REASBECELIGDIAGGRP)

Code	Label	Description of ICD-9 Codes	ICD-9 and Two-Digit Codes
00	Other	Infectious and parasitic diseases; neoplasms; endocrine/nutritional disorders; blood/blood-forming diseases; alcohol dependence syndrome and drug dependence; learning disorders and developmental speech or language disorders; disorders of nervous system; disorders of circulatory system; diseases of respiratory system; diseases of digestive system; diseases of genitourinary system; complications of pregnancy, childbirth and the puerperium; diseases of skin/subcutaneous tissue; conditions in the perinatal period; congenital anomalies; symptoms, signs and ill-defined conditions; injury and poisoning; physical problems not elsewhere classified	001.0-139.8, 01, 140.0–239.9, 02, 240.0–279.9, 03, 280.0–289.9, 04 ,303.00-304.93, 315.00-315.39, 320.0-359.9, 06, 390-459.9, 07 460-519.9, 08, 520.0-579.9, 09, 580.0-629.9, 10, 630-677, 11, 680.0-709.9, 12, 740.0-759.9, 14, 760.0–779.9, 15 780.01-784.2, 784.6-799.99, 16, 800.00–999.9, 17, 18
01	Mental Illness	Organic psychotic conditions, paranoid states, other non-organic psychoses, psychoses with origin specific to childhood, neurotic disorders, personality disorders, and other non-psychotic mental disorders (excluding alcohol dependence syndrome and drug dependence; learning disorders and developmental speech or language disorders; and mental retardation)	290.0-316, 05
02	Mental Retardation	Mild mental retardation and other specified and unspecified mental retardation	317-319
03	Muscular/ Skeletal	Muscle, bone, and joint problems including arthropathies, dorsopathies, rheumatism, osteopathies, and acquired musculoskeletal deformities	710.0-739.9, 13
04	Sensory Disorders	Visual, hearing, and speech disorders	360.00-389.9, 784.3-784.5
95	Refused	Verbatim indicates respondent refused to answer the question.	No ICD-9 codes
96	Duplicate condition reported	The condition has already been coded for the respondent.	No ICD-9 codes
97	No condition reported	The verbatim does not contain symptom or condition to code.	No ICD-9 codes
98	Don't know	The respondent reports that he/she does not know the condition.	No ICD-9 codes
99	Uncodeable	A code cannot be assigned based on the verbatim response.	No ICD-9 codes

Source: NBS, Round 4.

2. Industry and Occupation

Information about both a sample member's current employment and employment in 2009 was recorded in Section C and Section D of the questionnaire. For each job, respondents were asked what kind of work they did (C2 and D4) and for the type of business or industry (C3 and D5) they

were employed in. To maintain comparability with earlier rounds of the NBS, verbatim responses were coded according to the Bureau of Labor Statistics' 2000 Standard Occupational Classification (SOC).[26] The SOC is a system for classifying all work and major activities in the economy, including private, public, and military occupations, in which work is performed for pay or profit. Occupations are classified based on work performed, skills, education, training, and credentials. The sample member's occupation was assigned one occupation code. The first two digits of the SOC codes classify the occupation to a major group and the third digit to a minor group. For the NBS we assigned three-digit SOC codes to describe the major group the occupation belonged to and the minor groups within that classification (using the 23 major groups and 96 minor). In Appendix E, we list the three-digit minor groups classified within major groups.

Again, to maintain comparability with earlier rounds of the NBS, we coded verbatim responses to the industry items according to the 2002 North American Industry Classification System (NAICS).[27] The NAICS is an industry classification system that groups establishments into categories based on of activities in which those establishments are primarily engaged. The NAICS uses a hierarchical coding system through which all economic activity is classified into 20 industry sectors. For the NBS, we coded NAICS industries to three digits: the first two numbers specify the industry sector, and the third number specifies the sub-sector. (In Appendix F, we list the broad industry sectors.) Most Federal surveys use both the SOC and NAICS coding schemes, thus providing uniformity and comparability across data sources.

Mathematica developed supplemental codes for responses to questions about occupation and industry that could not be coded to a three-digit SOC or NAICS code (See Table V.7). As with health condition coding, we performed an initial quality assurance check, per coder, for the first several cases coded. During coding, we randomly selected 10 percent of responses for review. In total, a supervisor reviewed approximately 12 percent of all coded responses, including cases that coders flagged for review because they were unable or did not know how to code the responses. Approximately 15 percent of all cases were re-coded.

Table V.7. Supplemental Codes for Occupation and Industry Coding

Code	Label	Description
94	Sheltered workshop	Code used if occupation is in sheltered workshop and the occupation cannot be coded from verbatim.
95	Refused	The respondent refuses to give his/her occupation or type of business.
97	No occupation or industry reported	No valid occupation or industry is reported in the verbatim.
98	Don't know	The respondent reports that he/she does not know the occupation or industry.
99	Uncodeable	A code may not be assigned based on verbatim response.

Source: NBS, Round 4.

[26] For more information, see Standard Occupational Classification Manual, 2000, or http://www.bls.gov/soc.

[27] For more information, see North American Industry Classification System, 2002, or http://www.naics.com/info.htm.

The data file does not include the verbatim responses provided in C2 and C3. The coded responses to C2 for each listed job are in the constructed variables C_MainCurJobSOC, C_CurJob2SOC-C_CurJob3SOC. The coded responses to C4 are in C_MainCurJobNAICS, C_CurJob2NAICS-C_CurJob3NAICS.

D. Constructed Variables

To simplify the data file and assist the user, the NBS data file required the creation of more than 300 constructed variables. Constructed variables are created by combining information from two or more other sources of data to create one variable. The data file codebooks include the algorithms and specifications used to create the constructed variables.

Constructed variables are positioned to appear at the end of the section of variables from which they were created. All constructed variables begin with "C_" succeeded by a brief description of what the variable measures (for example, "C_TotCurWkHours" measures the total weekly hours the respondent currently worked at all of the jobs he or she listed).

For the NBS, the constructed variables fall into several categories as described below. In Appendix G, we list the constructed variable names and their descriptions.

1. Survey Administration

The first type of constructed variable includes survey administration and respondent descriptor variables. Included in this set of constructed variables are C_Rtype (indicating whether the interview was completed by the sample member or a proxy respondent), C_IntMode (CAPI or CATI interview), C_Resptype (indicating whether the interview was completed by the sample member only, the sample member with help, or a proxy only), and C_Intage (age at interview). In some cases, constructs were based on sampling variables, for example C_Cohort (sampling cohort). These constructs are positioned at the beginning of the file, prior to the questionnaire sections.

2. Logical Zero

To reduce the number of legitimate missing responses originating from survey skip patterns, we constructed logical zero constructs for variables that assess the amount of income the sample member received from a variety of sources in the month prior to interview (based on K3, K7a-K7h, K12, and K15). These constructs included the amount earned from jobs last month (C_LstMnthPay), the amount received from private disability insurance (C_AmtPrivDis), worker's compensation (C_AmtWorkComp), veteran's benefits (C_AmtVetBen), public assistance (C_AmtPubAssis), unemployment (C_AmtUnemply), private pension (C_AmtPrivPen), food stamps (C_AmtFoodStamp), other government programs (C_AmtOthGov), other sources on a regular basis (C_AmtOthReg), and from other sources on a nonregular basis (C_AmtOthNonReg). For example, if the respondent reported he or she did not receive private disability insurance last month (question K6a), the follow-up question asking how much private disability insurance was received (question K7a) was skipped. During data processing, such .L (logical skip) responses were recoded to $0. Thus, if the sample member reported not receiving private disability insurance the previous month, then the value of C_AmtPrivDis was "$0." Logical zero constructed variables are identified in the codebook user notes.

3. Duration and Amount Standardization

Throughout the NBS questionnaire, respondents had the option of reporting contacts with providers, income, and expenditures in the unit of their choosing—for instance, daily, weekly, or monthly. The NBS questionnaire was designed with the expectation that allowing respondents to select the time frame (ideally, the time frame with which they were most comfortable) would improve data quality. In these situations, the amount and the unit reported by the respondent existed as two distinct variables in the survey data. For example, question C12amt asked for the amount paid on a job and C12hop, how often the amount was paid. To aid the user, we constructed variables to standardize the time frame and produced a single variable (for example, C_MainJobHrPay) in one unit. In Sections C and D, we created both hourly pay (C_MainCurJobHrPay, C_MainJobHrPay2009) and monthly pay variables (C_MainCurJobMnthPay, C_MainCurJobMnthPayTH, C_MainJobMnthPay2009, C_MainJobMnthPayTH2009). The unit of time for reporting a respondent's current job to SSA was standardized to a week (C_MainCurJobRepSSA). Household income, as reported in L23Aamt and L23Ahop, was standardized to an annual unit (C_HhInc2004). We also standardized reporting units by creating variables in Section G referencing cost of services (C_ServCost2009, C_TotSerCost2009), costs of equipment and personal assistance services (C_CurMnthEquipExp, C_CurMnthPASExp, C_TotCurEquipPASExp), duration of visits with provider (C_DurProvVisit), number of contacts with provider (C_NumProvCont), and total money received from ENs (C_TotMoneyENS2009). The NBS codebook provides the specifications used to create the variables in the construct specification notes for each variable.

4. Pathing Combinations

We created other constructs to combine or summarize survey responses when answers could be provided in more than one place. For example, respondents could report current Medicare coverage at J1 when explicitly probed for this type of insurance and at J9 ("What kinds of health insurance coverage do you have?") if they reported having no current insurance at J1-J5. In this case, we created a construct that checked both J1 and J9 to determine if the respondent indicated Medicare coverage at either item (C_CurMedicare). This type of construct was created for all health insurance variables in Section J. We created similar constructs to flag awareness of the Ticket to Work program (C_AwareTTW) as well as the age at which the sample member first became limited (C_DisAge and C_AdultChildOnset), ever worked for pay (C_EvrWorked), and worked when limited (C_WrkdWhenLim). Similarly because G46 (family paid for services) was skipped if family was indicated as a source of payment in G45 (who paid for services from provider), we created constructs to identify sources of payments across these items (C_SelfFamPayServ-C_C_AgencyPayServ). The constructed variable code included in the codebooks provides the original questionnaire variables used to create each constructed variable.

Finally, we created several constructed variables in Section G to summarize information across providers. To facilitate the reporting of services received, respondents listed the names of places where they received various types of services (employment, job training, medical services, mental health services, and schooling). For each provider mentioned, respondents were then asked whether they received services from this provider in 2009. To consolidate the information, we created constructs to flag whether each type of service was ever received (C_EvrUseEmploy, C_EvrUsedServ) and which services were received in 2009 across providers (C_PhyTh2005-C_JobCch2009). In addition, we created constructs to flag whether services were ever received from particular types of providers (for example, C_EvrUseSVR) and whether respondents used those

providers in 2009 (for example, C_UseSVR2009). The provider constructs created in Section G are discussed in more detail below.

5. Scales

We constructed variables to summarize items that were part of a pre-existing scale, including a total SF-8TM physical and mental score (C_PCS8TOT, C_MCS8TOT), a score on the CAGE alcohol scale (C_CAGEAlcohol), and a drug dependence indicator (C_DrugDep). We created a body mass index (C_BMI) construct based on height and weight.

6. Other

We created additional constructs to simplify the analysis of income data (by creating a poverty-level construct), impairments (by creating a series of variables to identify the number of ADL, IADL, physical, emotional, other impairment types), job information (by collapsing information across jobs), and information about ENs and length of time in the TTW program (by summarizing across ENs).

E. SSA Administrative Data

Mathematica received administrative data from SSA for the purposes of selecting the sample; contacting, locating, and verifying sample members; and to fill information or drive instrument pathing in the survey instrument. Neither the Restricted Use nor the Public Use Files include personally identifying information received from SSA (for example, Social Security number, name, address, telephone number). Key items that were used for the creation of sampling strata and those that were used to dictate pathing in the instrument are included. These variables begin with "OrgSampInfo" to indicate that they are original sample file variables.

Given that the questionnaire did not ask respondents for the SSA benefit amount received last month, we retrieved such information from SSA administrative variables and incorporated it into the monthly income variables (C_AmtOthReg, C_TotGovCashBen). In addition, for the variable C_AmtOthNonReg, we included back payments received from SSA as other income received on a nonregular basis. We appended to the Public Use File additional administrative variables from the SSA records to enable more comprehensive data analysis. The data retain their original names and are included at the end of the file.

F. Public Use Variables

We edited some data to ensure the confidentiality of survey respondents for the Public Use File. File editing excluded variables containing information that could potentially be used either directly or indirectly to identify a sample member; we then constructed new variables to mask extreme or rare values and populations. Using SSA's Disclosure Review Board guidelines, we developed encryption and masking algorithms to maximize the analytic value of the data while maintaining acceptable confidentiality for program participants. We then created variables for the Public Use File to mask identifying questionnaire data. Such constructs end with a PUB and replace the original survey item in the Public Use File. These variables are also included on the Restricted Use File.

1. Variable Exclusion

To minimize the likelihood of indirect identification of a sample member, we deleted variables that could identify residents of smaller geographic areas or sample members with rare attributes (outliers). We paid particular attention to variables associated with fewer than 100 sample members distinguished by a given characteristic (small cell sizes). We also simplified the file by dropping variables with little analytic value, including survey administration variables, source variables with corresponding imputed versions, imputation flags, source variables summarized in a constructed variable, and constructed variables not yet used in Round 1 or 2 analyses. In addition, we dropped data elements with quality problems that would reduce the elements' analytic value. We also dropped SSA administrative data appended to the Restricted Use File; in their place, we masked certain key administrative variables and added them to the file as new constructs. In Appendix H, we list all variables dropped or replaced and the reason for the exclusion; in Appendix B, we list all variables included on and dropped from the Public Use File.

2. Masking and Constructing New Variables

We assessed the remaining variables for their confidentiality disclosure risk. When survey questions identified relatively rare populations, we constructed a new variable to combine small groups into larger groups. For many variables that posed a potential risk, constructed variables summarizing the information already existed on the file. When constructed variables did not exist, Mathematica prepared masking algorithms that maximized their analytic value while maintaining acceptable confidentiality for the program participants. Masking algorithms included top and bottom coding of continuous variables, collapsing continuous variables into categories, and combining responses for categorical variables. We assigned these Public Use File constructs the same variable name as the source variable and ended the constructs with PUB to indicate their creation for the Public-Use Data File. In Appendix J, we provide a complete list of all variables edited for confidentiality with a brief description of the re-code. Descriptions of the specific re-codes and construct specifications for each variable are also in the codebook.

G. Additional Details on Selected Constructed Variables

1. Jobs Held in 2009

In Section C (Current Employment), we collected job-related information for each job held at the time of interview. In Section D (Jobs/Other Jobs in 2009), we collected information for any other jobs held in 2009 not already reported in Section C. Data for each job are represented on the Restricted Use data file with an _n indicating which job the data are in reference to (for example, D6mth_1 indicating month started first job held in 2009, D4mth_2 indicating month started second job held in 2009, and so on). In both sections, respondents were asked to report first on their main job, that is, the job at which they worked the most hours, and then to subsequently report on other jobs held. To reduce respondent burden, respondents were not asked to report on any jobs held during 2009 that had previously been mentioned in section C as current employment. Rather, during data processing for all current jobs also held during 2009 (Table V.8), we copied employment data from Section C to Section D. We coded items in Section D with no equivalent in Section C (D8mth, D8yr, and D23) as .L (logical skip).

Table V.8. Job Variables in Sections C and D

Variable in C	Variable in D	Variable Description
C2	D4	Occupation
C3	D5	Industry
C4mth, C4yr	D6mth, D6yr	Start month and year of job
No equivalent item	D8mth, D8yr	Stop month and year of job
C6	D14	Self-employed status
C7	D15	Sheltered workshop status
C8	D16	Hours usually worked per week
C9	D17	Weeks usually worked per year
C10	D18	Paid by the hour
C11	D19	Hourly pay
C12amt, C12hop	D20amt, D20hop	Amount of pre-tax pay
C13amt, C13hop	D21amt, D21hop	Amount of post-tax pay
No equivalent item	D23_1 through D23_22	Reasons for stopping work

Source: NBS, Round 4.

a. Including Current Jobs Held in 2004 in Section D

Jobs mentioned in Section C were defined as held in 2009 if C4yr (year started current job) was earlier than or equal to 2009 and the job held in 2009 was held for longer than one month. We copied each applicable job from Section C into the first blank job slot in Section D (for example, copied into D6mth_2 if D6mth_1 already contained data and into D6mth_3 if both D6mth_1 and D6mth_2 already contained data). The variables C_job_from_SecC_1 through C_job_from_SecC_4 are included on the Restricted Use File to indicate which jobs from Section C (by job number) were copied into specific Section D job slots.

b. Determining Main Job Held in 2009

In addition to copying job data from Section C to Section D, we had to determine which job held in 2009 was the main job. Before including the jobs from Section C, we stored the main job held in 2009 as job 1. Since it was possible that a job reported in Section C was the respondent's main job in 2009, we compared hours worked in 2009 on each job with the first job mentioned in Section D once the jobs from Section C were incorporated. We considered as the main 2009 job the job with the greatest number of hours per year (numbers of hours per week multiplied by number of weeks per year).[28] The variable Main_Job_grid_num identifies the job number of the main job held in 2009 after this analysis.

[28] If hours per year could not be calculated because of missing data on either number of hours per week or number of weeks per year, it was coded as missing. If hours per year were missing for all 2009 Section C jobs, job 1 in Section D was counted as the main job in 2009. If no jobs were listed in Section D and hours per year were missing for all 2009 jobs in Section C, the first job listed in Section C that was a 2009 job was counted as the main job in 2009. If hours per year were missing for job 1 in Section D, the Section C job with most hours per year was counted as the main 2009 job. If there was no 2009 job from Section C or hours per year were missing for all Section C 2009 jobs, job 1 in Section D was counted as the main 2009 job. If hours per year were missing for all 2009 Section C jobs and from job 1 in Section D, job 1 in Section D was counted as the main job in 2009.

We used the main 2009 job to create a series of variables ending with _m to represent each job-specific item listed in Table V.8 for the main job held in 2009 (for example D6mth_m and D6yr_m). It is important to note that, in creating the variables ending with _m, we did not delete from the job_1-job_5 variables any information related to the main job. For example, for a case in Section D listing three jobs (after copying relevant jobs from Section C) where the second job is determined to be the main job, both D8_m and D_8_2 provide information related to hours worked on this job. Therefore, _m jobs should not be counted as additional jobs. The Public Use File includes only the main job variables (_m) for jobs held in 2009.

For purposes of the constructed variables created in this section, we created separate constructs for each job mentioned (job 1, job 2, and so on). We created additional constructs for the main job (C_MainJob2009SOC, C_MainJob2009NAICS, C_MainJobHrPay2009, C_MainJobMnthPay2009, C_MainJobMnthPayTH2009, and C_MnthsMain2009Job) as identified by the variable Main_Job_grid_num. As stated above, information in the main job constructs is replicated in one of the other job slots on the Restricted Use File and does not represent an additional job.

2. Service Providers

Section G asked respondents to discuss employment-related services and supports they received in 2009. To aid in the recall of such services, Section G first asked respondents if they had ever received employment services, job training, medical services, or counseling to improve their ability to work or live independently. For each service type, respondents could list up to eight providers or places where they received services (at G2, G11, G16, G20). Provider type was then collected for each provider mentioned. To minimize respondent burden by avoiding the need to ask provider type again if a provider was listed under two or more services, interviewers could indicate that a provider had already been mentioned, thus skipping the provider type follow-up questions. Once they listed providers, respondents were asked when they last received services from each provider. Section G then asked follow-up questions regarding specific services received, number of visits, duration of visits, cost of services, and usefulness of services received in 2009 for each provider from whom services were received in 2009.

Data for each specific provider mentioned were stored in a grid using the convention _n (1-34) to indicate data associated with each provider. Providers mentioned under G2 (employment services received) were stored in slots _1-_10; providers mentioned under G11 (job training) were stored in slots _11-_18; providers mentioned under G16 (medical services) were stored in slots _19-_26; and providers mentioned under G20 (therapy or counseling) were stored in slots _27-_34. This convention was maintained throughout the section so that data associated with the second provider listed under G2 (_2) are always found in the _2 variables (for example G33_2) and data associated with the second provider listed under G11 (_12) are found in the _12 variables (for example G33_12).

To simplify Section G for purposes of analyses, we created a series of constructed variables. We first assigned each provider a code (C_ProvType2009_1-_34) indicating the type of provider delivering services (see the NBS codebook for detailed construct specifications). We also created constructs to identify services received from each provider (for example, C_PhyTh2009_1-_34, C_OccTh2009_1-_34, and so on), the duration of the visit with each provider (C_DurProvVisit_1-C_DurProvVisit_34), the number of contacts with each provider (C_NumProvCont_1-C_NumProvCont_34), and the usefulness of services received from each provider (C_ProvUse2009_1-C_ProvUse2009_34). We then created variables to classify providers by type so that we could develop a list of providers and services received by provider type. For example, if the

first provider mentioned by the respondent was an SVRA, we considered such provider the first SVRA provider (C_Provtype2005_01_1), with _01 indicating provider type 1 (SVRA) and _1 indicating first provider of this type mentioned. If the second provider was a mental health provider, we considered the provider the first mental health provider (C_Provtype2009_03_1). If the third provider was another SVRA, we considered the provider the second SVRA provider (C_Provtype2009_01_2). We then linked these variables to data pertaining to specific services received, payment of services, and duration and usefulness of visits mentioned above (for example, C_Phyth2009_01_1 indicating that physical therapy was received by the first SVRA provider). In Table V.9, we list the classification of provider types.

Table V.9. Numeric Values Associated With Provider Types

Provider Type	Description
1	SVRA
2	Welfare agency
3	Mental health agency
4	Other state agency
5	Private business
6	Other non-state agency
7	School
8	Unemployment office
9	Unknown employment/training
10	Clinic/hospital/physician
11	Rehabilitation treatment center
12	Other medical/mental health provider
13	Unknown medical/mental health provider

Source: NBS, Round 4.

We created additional constructs that summarized provider types across services, for example, C_EvrUseSVR (indicating that the sample member ever used an SVRA) and C_UseSVR2009 (indicating that an SVRA was used in 2009), as well as specific services received across providers, for example, C_PHYTH2009 (received physical therapy in 2009), C_OCCTHER2009 (received occupational therapy in 2009), and so on.

The Public Use File does not provide source variables and intermediary constructs related to the data collection grid (_1-_34). Given small cell sizes, we combined welfare agency (type = 2), other non-state agency (type = 6), and unemployment office providers (type = 8) with provider type other state agency (type = 4). We dropped provider type = 9 (unknown employment provider) and type = 13 (unknown medical provider). For the Public-Use Data File, we dropped second and third providers for many provider types because of small cell sizes.

This page has been left blank for double-sided copying.

VI. SAMPLING WEIGHTS

The final analysis weights for the Representative Beneficiary Sample and Ticket Participant Sample were determined via a four-step process: (1) calculate the initial probability weights, (2) adjust the weights for two phases of nonresponse (location and completion), (3) trim the weights to reduce the variance, and (4) post-stratification. In Section A, we summarize the procedures used to compute and adjust the sampling weights as well as the procedure for creating composite weights.[29] In Sections B and C, respectively, we describe the procedures for computing the weights for the Representative Beneficiary Sample and the Ticket Participant Sample.

A. Computing and Adjusting the Sampling Weights: A Summary

1. Representative Beneficiary Sample

The sampling weights for any survey are computed from the inverse selection probability that incorporates the stages of sampling in the survey. We selected the Representative Beneficiary Sample in two stages by (1) selecting primary sampling units (PSU) as part of the Round 1 sampling activities and (2) selecting the individuals within the PSUs from a current database of beneficiaries.[30] The Round 1 PSUs were the first-stage sampling units for all subsequent rounds. We selected 79 of these PSUs, with 2 PSUs—Los Angeles County, California, and Cook County, Illinois—acting as certainty PSUs because of their large size.[31] The Los Angeles PSU received a double allocation because it deserved two selections. The sample of all SSA beneficiaries (Representative Beneficiary Sample) was selected from among beneficiaries residing in these 79 PSUs. For the Representative Beneficiary Sample, the Los Angeles County and Cook County PSUs had a much larger number of beneficiaries than other counties, and were therefore partitioned into a large number of Secondary Sampling Units (SSUs) based on beneficiaries' ZIP codes. From these SSUs, we selected four SSUs from the Los Angeles PSU and two from the Cook County PSU.[32] Beneficiaries were selected from the PSUs or SSUs using age-defined sampling strata. In total, we selected SSA beneficiaries from 83 locations (77 PSUs and 6 SSUs) across the 50 states and the District of Columbia. We used four age-based strata in each PSU. In particular, we stratified beneficiaries into the following age groups: 18- to 29-year-olds, 30- to 39-year-olds, 40- to 49-year-olds, and 50-year-olds and older. Because we used a composite size measure to select the PSUs, we could achieve equal probability samples in the age strata and nearly equal workload in each PSU for the Representative Beneficiary Sample.[33]

---

[29] For the Ticket Participant Sample, we combined, when needed, the supplemented stratified sample with the PSU-based Ticket Participant Sample, using a composite weight. We also combined the Representative Beneficiary Sample with the Ticket Participant Sample, using composite weights.

[30] An intermediate stage of sampling of secondary sampling units (SSUs) was used in two PSUs, but for the sake of simplicity, these SSUs are generally equivalent to PSUs in this description. All PSUs and SSUs were selected during Round 1 sampling.

[31] Los Angeles County includes the city of Los Angeles; Cook County includes the city of Chicago.

[32] It was therefore possible for a beneficiary to reside in one of the selected PSUs (Los Angeles County or Cook County) and not be selected because they did not reside in one of the selected SSUs.

[33] The composite size measure was computed from the sum of the products of the sampling fraction for a stratum and the estimated count of beneficiaries in that stratum and PSU (Folsom et al. 1987).

For the initial beneficiary sample, we selected more individuals than we expected to need in order to account for differential response and eligibility rates in both the PSUs and the sampling strata. We randomly partitioned this augmented sample into subsamples (called "waves") and used some of the waves to form the actual final sample (i.e., released for data collection). We released an initial set of waves and then monitored data collection to identify which PSUs and strata required additional sample members. After we released sample members in the initial waves, we were able to limit the number of additional sample members (in subsequently released waves) just to those PSUs and strata requiring them and thus achieved sample sizes close to our targets while using the smallest number of beneficiaries. Controlling the release of the sample also allowed us to control the balance between data collection costs and response rates. We computed the initial sampling weights based the inverse of the selection probability for the augmented sample. Given that we released only a subset of the augmented sample, we then adjusted the initial weights for the actual sample size. The release-adjusted weights were post-stratified to population totals obtained from SSA.[34]

We then needed to adjust the initial sampling weights for nonresponse. A commonly used method for computing weight adjustments is to form classes of sample members with similar characteristics and then use the inverse of the class response rate as the adjustment factor in that class. The adjusted weight is the product of the sampling weight and the adjustment factor. We formed the "weighting classes" in such a way to ensure that there were sufficient counts in each class to make the adjustment more stable (that is, to ensure smaller variance). The natural extension to the weighting class procedure is to perform logistic regression with the weighting class definitions used as covariates, provided that each level of the model covariates has a sufficient number of sample members to ensure a stable adjustment. The inverse of the propensity score is then the adjustment factor. The logistic regression approach also has the ability to include both continuous and categorical variables, and standard statistical tests are available to evaluate the selection of variables for the model. For the nonresponse weight adjustments (at both the location and cooperation stages), we used logistic models to estimate the propensity for a sample member to respond. The adjusted weight for each sample case is the product of the initial sampling weight and the adjustment factor.

We calculated the adjustment factor in two stages: (1) by estimating a propensity score for locating a sample member and (2) by estimating a propensity score for response among these located sample members. In our experience with the NBS, factors associated with the inability to locate a person tend to differ from factors associated with cooperation. The unlocated person generally does not deliberately avoid or otherwise refuse to cooperate. For instance, that person may have chosen not to list his or her phone number or may frequently move from one address to another, even though there is no evidence to suggest that, once located, he or she would show a specific unwillingness to cooperate with the survey. Located nonrespondents, on the other hand, may deliberately avoid the interviewer or express displeasure or hostility toward surveys in general or SSA in particular.

To develop the logistic propensity models for Round 4, we used as covariates information from the SSA data files as well as geographic information (such as urban or rural region). We obtained much of the geographic information from the Area Resource File (ARF 2009–2010), a file with

[34] The totals were obtained from a frame file provided by SSA that contains basic demographics for all SSI and SSDI beneficiaries.

county-level information about the population, health, and economic-related matters for every county in the United States. Using a liberal level of statistical significance (0.3) in forward and backward stepwise logistic regression models, we made an initial attempt to reduce the pool of covariates and interactions. We used a higher significance level because each model's purpose was to improve the estimation of the propensity score, not to identify statistically significant factors related to response. In addition, the information sometimes reflected proxy variables for some underlying variable that was both unknown and unmeasured. We excluded from the pool any covariate or interaction that was clearly unrelated to locating the respondent or to response propensity. Given that the stepwise logistic regression analysis does not fully account for the complex survey design, we developed the final weighted models by using SUDAAN software, which accounts appropriately for the complex sample design.

The next step called for the careful evaluation of a series of models by comparing the following measures of predictive ability and goodness of fit: the R-squared statistic, Akaike's Information Criterion (AIC),[35] the percentage of concordant and discordant pairs, and the Hosmer-Lemeshow goodness-of-fit test. Model-fitting also involved reviewing the statistical significance of the coefficients of the covariates in the model and avoiding any unusually large adjustment factors. In addition, we manipulated the set of variables to avoid data warnings in SUDAAN.[36] We then used the specific covariate values for each located person to estimate the propensity score, from which the adjustment factor was determined by taking the inverse. When computing the adjustment factors, we limited the maximum location adjustment to smaller than two and the maximum cooperation adjustment to smaller than three. If such a location adjustment was not possible, we used a trimming algorithm to reallocate the part of location adjustments greater than two (or the part of the cooperation adjustments greater than three) to other individuals with smaller adjustment factors.[37] The location-adjusted weight is the product of the released-adjusted probability weight and the trimmed location adjustment. The nonresponse-adjusted weight is the product of the location-adjusted weight and the inverse of the cooperation propensity score, calculated in the same manner as the location propensity score.

Once we made the adjustments, we assessed the distribution of the adjusted weights for unusually high values, which could make the survey estimates less precise. We used the design effect attributed to the variation in the sampling weights as a statistical measure to determine both the necessity and amount of trimming. The design effect attributed to weighting is a measure of the potential loss in precision caused by the variation in the sampling weights relative to a sample of the same size with equal weights. We also wanted to minimize the extent of trimming to avoid the

---

[35] Akaike's Information Criterion is defined as AIC = -2LogL + 2(k+s), where LogL is the log likelihood of the binomial distribution using the parameters from the given model, k is the total number of response levels minus 1, and s is the number of explanatory effects (Akaike 1974). AIC is a relative number and has no meaning on its own. For a given model, smaller values of AIC are preferable to larger values.

[36] SUDAAN data warnings usually included one or more of the following: (1) an indication of a response cell with zero count; (2) one or more parameters approaching infinity (which may not be readily observable with the parameter estimates themselves); and (3) degrees of freedom for overall contrast less than the maximum number of estimable parameters. We tried to avoid all of these warnings, although avoidance of the first two was of highest priority. The warnings usually were caused by a response cell with a count that was too small, which required dropping covariates or collapsing categories in covariates.

[37] This is a form of weight trimming. Among the location adjustments, 26 cases were trimmed, and 5 cases had a trimmed cooperation adjustment factor (discussed in Section B.2.d of this chapter).

potential for bias in the survey estimates. For the Representative Beneficiary Sample, we checked the design effect attributable to unequal weighting within the age-related sampling strata and determined that no further trimming of the adjusted weights was required. The maximum design effect among all age strata in the Representative Beneficiary Sample was 1.10.

The final step is a series of post-stratification adjustments through which the weights sum to known totals obtained from SSA on various dimensions (specifically, gender, age grouping, and, for beneficiaries only, recipient status[38]). After post-stratification, we checked the survey weights again to determine whether more trimming was needed. In Round 4, trimming was not needed after post-stratification in the Representative Beneficiary Sample.

2. Ticket Participant Sample

We computed the initial sampling weights for the Ticket Participant Sample based of the inverse of the selection probability for the participant. As with the Representative Beneficiary Sample, we used the PSUs as the primary source of sample members and, when possible, selected an initially larger (augmented) sample. We selected the sample of all TTW participants (Ticket Participant Sample) from among participants residing in the same PSUs and used no secondary sampling units.[39] In all four rounds of the NBS, the number of Ticket participants in the selected PSUs was insufficient in one or more participant strata for the analysis. For such strata, we drew a supplemental single-stage sample from all Ticket participants, those both in and not in the PSUs, with stratification based on payment type (Rounds 1 through 3) or provider and payment type (Round 4) and whether the participant was or was not in a PSU.

For participants with Tickets assigned either to SVRAs acting as ENs or non–SVRA ENs, the PSUs in the initial sampling design lacked a sufficient number of participants to support the analysis tasks—even with all participants in the PSUs from these two provider-payment types selected for the sample. As a result, we had to supplement the sample from the PSUs with a second independent sample of Ticket participants from two geographic strata defined by the PSUs (participants residing in a PSU or not residing in any of the PSUs).[40] We refer to the initial sample design as the "clustered" sample; the second independent sample is referred to as the "unclustered" sample. Mathematica randomly selected sample members in the unclustered sample in the two aforementioned geographic strata from the entire population of participants with Tickets assigned to SVRAs receiving traditional CR payments and participants with tickets assigned to non–SVRA ENs.[41] We referred to the combination of data from the clustered and unclustered samples to calculate estimates as a paired sample design (discussed later).

---

[38] Disability payments were made in the form of SSI or SSDI or both.

[39] For the Ticket Participant Sample, Mathematica selected participants from the entire Los Angeles County PSU and from the entire Cook County PSU.

[40] Given that the target population for the NBS did not include Puerto Rico or other outlying territories, we excluded from the frame all beneficiaries and Ticket participants who resided in these areas.

[41] Because of the small populations for the provider types where the paired sample design was required, Mathematica often selected Ticket participants who resided in the selected PSUs for these provider types for both the clustered and in-PSU strata of the unclustered samples. Hence, we had to count these duplicate cases in the weighting process (discussed later).

As with the Representative Beneficiary Sample, we computed the weights for the augmented sample and then adjusted them for the number of sample members released into the final sample. We adjusted for located sample members and then for response among such members. We used logistic propensity models to calculate the location adjustment for all Ticket participants and the response adjustments for located Ticket participants of all three provider-payment types. As needed, we trimmed adjustments so that they did not exceed two for the location model and three for the cooperation model.[42] The modeling procedures were similar to those used with the Representative Beneficiary Sample.

The size of the sample for the three provider-payment types was similar, but the size of the population for each was markedly different. (More than 80 percent of the population of Ticket participants had their Ticket assigned to an SVRA under the traditional payment system. In Section C, we provide percentages for each phase and provider-payment type.) Hence, the sampling weights differed substantially in magnitude from one provider-payment type to the next. As a result, we conducted the weight adjustments separately for each provider-payment type. For the subsamples associated with provider-payment type within the Ticket Participant Sample, we trimmed the weights to ensure that the design effect attributable to unequal weighting was not substantially greater than 3.0 (less than 3.0, if possible). (In Section C, we provide more detail on the trimming of participants' weights and the design effects attributable to unequal weighting before and after trimming.) The final adjustment for participants' weights was a post-stratification adjustment to the counts of participants within subgroups defined by age and gender in the sampling frame. After post-stratification, we checked the survey again to determine the need for more trimming. Even though the Round 4 weights required trimming before post-stratification in the Ticket Participant Sample, they required no further trimming after post-stratification.

3. Composite Weights

While the Ticket participant population constitutes a small subset of the beneficiary population, some analyses required a sample with a substantial number of individuals both within and outside the Ticket participant population. Such a sample simply represents a combination of the Ticket Participant and Representative Beneficiary samples and required the use of composite weights to account for the combined sample. When conducting analyses representing the beneficiary population, we used the combined sample weights to make estimates about participants within the beneficiary population. (Analyses limited to the participants' subpopulation used weights from the Ticket Participant Sample only.)

In Round 1, we used a sophisticated procedure to create the weights in order to minimize the variance of survey estimates. The procedure allowed weights to be applied to observations duplicated across the two samples.[43] However, given that Ticket participants were such a small fraction of the beneficiary sample frame, we used a simpler alternative method in Rounds 2, 3, and 4.

---

[42] Across the three Ticket participant subpopulations, we trimmed 11 location adjustment factors and 4 cooperation adjustment factors (details in Section C.2.d of this chapter).

[43] A complex procedure also combined the clustered and unclustered samples of the Ticket Participant Sample in all rounds (described in Section C of this chapter).

In Round 4, we replaced the original Representative Beneficiary Sample weights with a value of zero among the 50 Ticket participants selected for that sample. To ensure representation of the Ticket participant population, we replaced these 50 members of the Representative Beneficiary Sample with the 4,334 members of the Ticket Participant Sample who had completed an interview (or had ineligible dispositions after sample selection). The sum of the weights for the 50 participants in the Representative Beneficiary Sample is an unbiased estimate of the number of participants in the sampling frame. However, given the relatively small number of Ticket participants in the Representative Beneficiary Sample, the estimate did not equal the known total in the sampling frame, as expected. The post-stratification adjustment realigned the population totals.

4. Quality Assurance

To ensure that the methods used to compute the weights at each step were sound, a senior statistician conducted a final quality assurance check of the weights from the Representative Beneficiary and Ticket Participant cross-sectional samples as well as the composite weights. For the sake of objectivity, we chose a statistician not directly involved in the project.

B. Representative Beneficiary Sample

1. Initial Weights

We computed the initial weights by using the inverse of the probability of selection. For the Representative Beneficiary Sample, we selected samples independently in each of four age strata in each geographic unit or PSU.[44] We determined the number of sample members selected in each stratum and PSU for the augmented sample by independently allocating five times the target sample size across the 83 geographic units (PSUs and secondary sampling units) for each stratum,[45] thereby ensuring the availability of ample reserve sample units in case response or eligibility rates were lower than expected. The augmented sample size for the three younger age strata (18- to 29-year-olds, 30- to 39-year-olds, and 40- to 49-year-olds) was 3,335 sample members (roughly five times the target sample size of 667); for beneficiaries age 50 and older, the augmented sample size was 1,998 (again, five times the target sample size of 400). By using the composite size measure already described, we calculated the initial weights for the full augmented sample of 12,000 sample members by taking the inverse of the global sampling rate (Fi) for each stratum. In Table VI.1, we provide the global sampling rates and initial weights.

[44] The sample of PSUs contained 79 unique selections. Given the size of its beneficiary population, the PSU representing Los Angeles County (LA) received two selections. Within the LA PSU, we formed SSUs and selected four. In the PSU representing Cook County (Chicago), we also formed SSUs in order to decrease travel costs and selected two. The six SSUs and the other 77 PSUs (83 units) were treated as PSUs for the beneficiary sample.

[45] We selected an augmented sample that was five times as large as needed in order to allow for both an adequate supplemental sample in all PSUs and sampling strata within the PSUs and to account for expected variation in the response and eligibility rates across PSUs and sampling strata.

Table VI.1. Survey Population as of June 30, 2009, Initial Augmented Sample Sizes and Initial Weights by Sampling Strata in the National Beneficiary Survey

Sampling Strata (ages as of June 30, 2009)	Survey Population[a]	Augmented Sample Size	Global Sampling Rate (Fj)	Initial Sample Weights	Released Sample
Beneficiaries age 18 to 29	1,295,767	3,335	0.002574	388.5	1,029
Beneficiaries age 30 to 39	1,314,526	3,335	0.002537	394.2	1,032
Beneficiaries age 40 to 49	2,524,579	3,335	0.001321	757.00	1,019
Beneficiaries age 50 and older	6,982,459	1,998	0.000286	3,496.5	603
Total	12,117,331	11,999			3683

Source: Sample allocation and counts computed by Mathematica.

[a] The survey population represents all SSI and SSDI beneficiaries in the 50 states and the District of Columbia. It excludes 185,840 beneficiaries who live in Puerto Rico and other outlying territories.

As described previously, we randomly partitioned the full sample into subsamples called "waves" that mirrored the characteristics of the full sample. The waves were formed in each of the four sampling strata in the 83 geographic units (a total of 332 combinations of PSUs and sampling strata). At the start of data collection, we assigned a preliminary sample to the data collection effort and then assigned additional waves as needed, based on experience with eligibility and response rates. Within the 336 combinations of PSUs and sampling strata, we adjusted the initial weights to account for the number of waves assigned to data collection. The final sample size for the Representative Beneficiary Sample totaled 3,683 beneficiaries, as shown under "Released Sample" in Table VI.1.

2. Nonresponse Adjustment

As in virtually all surveys, we had to adjust the sampling weights to compensate for sample members who could not be located or who, once located, refuse to respond. First, we fitted weighted logistic regression models where the binary response was whether the sample member could be located. Using variables obtained from SSA databases, we selected, through stepwise regression, a pool of covariates from which to choose a final location model. The pool included both main effects and interactions. From the pool of covariates, we used various measures of goodness of fit and predictive ability to compare candidate models while avoiding large adjustments. Even though we developed the logistic regression propensity models to minimize the number of large adjustment factors, we still had to trim the adjustment factors within trimming classes, based on the four age categories, in order to ensure that the maximum did not exceed two. We repeated the process for interview respondents among the located sample members and fitted another weighted logistic regression model, trimming large adjustments within the four age categories so that the maximum did not exceed three.[46] The two levels in the binary response for this model were "respondent" or "nonrespondent." For the Representative Beneficiary Sample, a sample member was classified as a respondent if the sample member or the person responding for the sample member completed the interview (that is, an eligible respondent) or if the sample member was

[46] As stated earlier, we trimmed 26 location adjustment factors and 5 cooperation adjustment factors (discussed in Section B.2.d of this chapter).

deemed ineligible after sample selection (an ineligible respondent). Ineligible sample members included persons who were never SSA beneficiaries, were in the military at the time of the survey, were incarcerated, had moved outside the United States, or were deceased at the time of the survey.

Based on the above procedures, the main factors or attributes affecting our ability to locate and interview a sample member included the sample member's personal characteristics (race, ethnicity, gender, and age), identity of the payee with respect to the beneficiary, whether the beneficiary and the applicant for benefits lived in the same location, how many phone numbers or addresses were n the SSA files for the beneficiary, living situation of beneficiary, and geographic characteristics, including attributes of the county where the beneficiary lives.

a. Coding of Survey Dispositions

The Mathematica Survey Management System maintained the status of each sample member during the survey, with a final status code assigned after the completion of all locating and interviewing efforts on a given sample member or at the conclusion of data collection. For the nonresponse adjustments, we classified the final status codes into four categories:

1. Eligible respondents.
2. Ineligible respondents (sample members ineligible after sample selection, including deceased sample members, sample members in the military or incarcerated, sample members living outside the United States, and other ineligibles).
3. Located nonrespondents (including active or passive refusals and language barrier situations).
4. Unlocated sample members (sample members who could not be located through either central office tracing procedures or in-field searches).

This classification of the final status code allowed us to measure the overall response rate, the completion rate among located sample members, and the location rate among all sample members.[47]

b. Response Rates

The 72.8 percent **response rate** for the Representative Beneficiary Sample noted in the introduction to this report and given in the first line of Table VI.2, is the weighted count of sample members who completed an interview or were deemed ineligible, divided by the weighted sample

[47] Disposition codes 420 (institutionalized) and 430 (unavailable during field period) were classified as nonrespondent codes in Rounds 2, 3, and 4, even though they were considered ineligible codes in Round 1. This affected cases in the beneficiary samples of Round 2 (eight cases), Round 3 (six cases), and Round 4 (five cases). As a result, the nonresponse adjusted weight for these cases was zero in Rounds 2, 3, and 4, even though a similar response in Round 1 would have resulted in a positive weight. In view of the small numbers, the effect on response rates was very small.

count of all sample members.[48] It may be determined by taking the product of the weighted location rate and the weighted cooperation rate, also known as the weighted completion rate, among located sample members.

Table VI.2. Weighted Location and Response Rates for the Representative Beneficiary Sample, by Selected Characteristics

	Sample	Located Sample		Response Among Located Sample		Overall Respondents
	Count	Count	Location Rate	Count	Response Rate	Response Rate
All	3,683	3,345	93.3	2,520	77.8	72.8
SSI Only, SSDI Only, or Both SSI and SSDI						
SSI only	1,581	1,404	90.4	1,068	78.7	71.6
SSDI only	1,322	1,237	96.1	922	76.8	74.0
Both SSI and SSDI	780	704	90.4	530	79.1	71.8
SSI or SSDI						
SSI only or both SSI and SSDI	2,361	2,108	90.4	1,598	78.9	71.7
SSDI only or both SSI and SSDI	2,102	1,941	94.6	1,452	77.4	73.4
Constructed Disability Status						
Deaf	44	40	92.5	29	80.1	75.5
Mental	2,016	1,811	91.8	1,333	76.7	70.6
Physical	1,488	1,379	94.6	1,071	78.7	74.8
Unknown	135	115	89.1	87	76.4	68.0
Beneficiary's Age (four categories)						
18 to 29	1,029	921	90.0	705	77.7	70.2
30 to 39	1,032	912	88.5	679	75.4	67.3
40 to 49	1,019	941	92.7	699	75.7	70.5
50 and older	603	571	95.0	437	79.1	75.2
Sex						
Male	1,935	1,751	93.3	1,297	76.4	71.5
Female	1,748	1,594	93.2	1,223	79.2	74.2
Hispanicity						
Hispanic	250	214	89.3	153	63.9	58.9
Non-Hispanic	3,433	3,131	93.5	2,367	78.6	73.6

[48] The response rate is calculated as the weighted count of sample members who completed an interview or were deemed ineligible divided by the weighted sample count of all sample members: (number of completed interviews + number of partially completed interviews + number of ineligibles)/(number of cases in the sample). The response rate is essentially equivalent to the American Association of Public Opinion Research (AAPOR) standard response rate calculation, assuming that all nonrespondents have unknown eligibility status: RR_{AAPOR} = number of completed interviews/(number of cases in the sample - estimated number of ineligible cases). Ineligible cases are included in the numerator and denominator for two reasons: (1) the cases classified as ineligible are part of the original sampling frame (and hence the study population), and we obtained complete information for fully classifying these cases (that is, their responses to the eligibility questions in the questionnaire are complete) such that we may classify them as respondents; and (2) incorporation of the ineligibles into the numerator and denominator of the response rate is essentially equivalent to the definition of a more conventional response rate, assuming that all nonrespondents have unknown eligibility status.

Table VI.2 *(continued)*

	Sample	Located Sample		Response Among Located Sample		Overall Respondents
	Count	Count	Location Rate	Count	Response Rate	Response Rate
Race						
White	2,115	1,955	94.1	1,465	77.1	72.7
Black	857	761	92.4	594	82.7	76.6
Unknown	628	555	92.2	413	75.7	70.8
Asian American, Pacific Islander,	57	51	85.0	27	36.8	29.8
North American Indian, or Alaskan Native	26	23	78.8	21	94.0	74.4
Living Situation						
Living alone	2,362	2,124	91.8	1,622	79.3	73.2
Living with others	273	252	88.9	187	80.8	72.2
Living with parents	72	60	84.4	40	68.3	57.6
In institution or unknown	976	909	96.0	671	75.6	72.7
Did the Applicant for Benefits Live in Same ZIP Code as the Beneficiary?						
No	387	331	84.8	236	72.9	62.6
Yes	2,199	1,998	93.5	1,538	80.6	75.7
No information	1,097	1,016	94.8	746	75.0	71.0
Identity of the Payee with Respect to Beneficiary						
Beneficiary received beneficiary payments himself or herself	108	99	95.6	65	60.1	58.4
Payee is a family member	1,262	1,138	90.5	856	76.9	69.9
Payee is an institution	220	200	90.1	150	77.2	69.9
Other	2,093	1,908	94.1	1,449	78.7	74.2
Count of Phone Numbers in File						
Only one phone number in file	59	58	98.8	48	82.4	81.2
Two phone numbers in file	513	491	96.1	394	80.9	77.9
Three phone numbers in file	331	294	92.2	210	74.7	69.5
Four phone numbers in file	265	228	85.9	168	77.6	68.4
Five or more phone numbers in file	1,056	851	83.2	623	76.9	63.9
No information	1,459	1,423	98.7	1,077	77.8	76.8
Count of Addresses in File						
One address in file	1,416	1,336	96.6	1,065	81.2	78.5
Two addresses in file	1,017	872	88.5	628	73.9	65.2
Three or more addresses in file	417	313	73.8	207	71.0	52.5
No information	833	824	99.2	620	78.8	78.2
Type of Claim						
Survivor	393	369	92.7	261	74.6	69.3
Disabled	1,787	1,644	95.0	1,244	78.0	74.3
Unknown	1,503	1,332	90.2	1,015	78.4	71.1
Census Region						
Midwest	888	798	92.6	604	78.1	72.4
Northeast	583	532	94.0	389	77.7	73.4
South	1,501	1,387	95.0	1,072	79.5	75.8
West	711	628	89.5	455	73.6	66.0

Table VI.2 *(continued)*

	Sample	Located Sample		Response Among Located Sample		Overall Respondents
	Count	Count	Location Rate	Count	Response Rate	Response Rate
Census Division						
East North Central	630	559	91.7	432	81.7	75.1
East South Central	286	269	94.7	215	83.5	79.3
Middle Atlantic	400	364	94.1	267	79.8	75.3
Mountain	190	170	90.1	128	76.6	68.7
New England	183	168	93.9	122	73.0	69.1
Pacific	521	458	89.3	327	72.5	65.0
South Atlantic	839	767	94.5	572	76.7	72.7
West North Central	258	239	94.9	172	68.6	65.4
West South Central	376	351	96.2	285	82.2	79.5
Metropolitan						
Metropolitan areas of 1 million population or more	1,592	1,438	92.7	1,062	76.9	71.4
Metropolitan areas of 250,000 to 999,999 population	962	870	93.2	649	78.2	73.4
Metropolitan areas of fewer than 250,000 population	409	368	92.7	273	74.1	68.6
Nonmetropolitan areas adjacent to large metropolitan areas	267	250	95.8	199	77.6	74.6
Nonmetropolitan areas adjacent to medium or small metropolitan areas	257	242	96.5	199	86.8	83.9
Nonmetropolitan areas not adjacent to metropolitan areas	196	177	91.1	138	76.4	69.7
County with Low Education						
Yes	565	518	94.9	394	76.7	73.3
No	3,118	2,827	93.0	2,126	78.0	72.7
County with Housing Stress						
Yes	1,535	1,384	92.4	1,022	76.2	70.8
No	2,148	1,961	93.8	1,498	78.9	74.2
Population Loss County						
Yes	395	361	94.9	283	84.4	80.6
No	3,288	2,984	93.1	2,237	77.0	71.9
Retirement Destination County						
Yes	498	443	90.5	343	77.6	70.4
No	3,185	2,902	93.7	2,177	77.8	73.2
Service- Dependent Economy County						
Yes	1,556	1,403	91.4	1,018	74.9	68.8
No	2,127	1,942	94.6	1,502	79.8	75.6
Nonspecialized- Dependent Economy County						
Yes	1,023	922	94.5	719	79.8	75.5
No	2,660	2,423	92.8	1,801	77.1	71.8
Government- Dependent Economy County						
Yes	349	322	93.7	234	73.8	69.2
No	3,334	3,023	93.2	2,286	78.2	73.2

Table VI.2 *(continued)*

	Sample	Located Sample		Response Among Located Sample		Overall Respondents
	Count	Count	Location Rate	Count	Response Rate	Response Rate
County Racial/Ethnic Profile						
County with at least 90% non-Hispanic white population	594	545	94.8	435	79.5	75.4
County with plurality or majority Hispanic population	392	348	93.0	263	74.4	69.8
County with majority but fewer than 90% non-Hispanic white population	1,413	1,281	93.1	953	77.8	72.8
County with a racially/ethnically mixed population, no majority group	1,089	989	92.3	712	75.7	69.9
County with plurality or majority non-Hispanic black population	142	132	97.2	114	91.0	88.9
County with at least 20% American Indian population	53	50	91.2	43	84.7	77.2
Phase						
Phase 1	1,086	981	92.9	716	75.8	70.7
Phase 2	1,124	1,022	93.2	785	79.2	73.9
Phase 3	1,473	1,342	93.6	1,019	78.2	73.5

Source: NBS, Round 4.

The **weighted location rate** is the ratio of the weighted sample count for located sample members to the weighted count of all sample members, given in Table VI.2 as 93.3 percent. The **weighted cooperation rate** (the weighted completion rate among located sample members), 77.8 percent in Table VI.2, is the weighted count of sample members who completed an interview or were deemed ineligible, divided by the weighted sample count of all located sample members. Weighted cooperation rates reflect the common survey situation that, once a person is located, repeated contact efforts often result in a completed interview.

We use the weighted rates because: (1) the sampling rates (therefore the sampling weights) vary substantially across the sampling strata, as seen in Table VI.1, and (2) the weighted rates better reflect the potential for nonresponse bias. The weighted rates represent the percentage of the full survey population for which we were able to obtain information sufficient for use in the data analysis or in determining ineligibility for the analysis.

c. Factors Related to Location and Response

In addition to overall response rate information, Table VI.2 provides information for selected factors associated with locating a sample member and for factors associated with response among located sample members. The table displays the unweighted counts of all sample members, counts of located sample members, and counts of sample members who completed an interview or were deemed ineligible. We also include in the table the weighted location rate, the weighted completion rate among located sample members, and the weighted overall completion rate for these factors, which helped inform the decision about the final set of variables to be used in the nonresponse adjustment models.

d. Propensity Models for Weight Adjustments

Using the main effects already described as well as selected interactions, we developed response propensity models to determine the nonresponse adjustments. To identify candidate interactions from the main effects for the modeling, we first ran a chi-squared automatic interaction detector (CHAID) analysis in SPSS to find possible significant interactions.[49] The CHAID procedure iteratively segments a data set into mutually exclusive subgroups that share similar characteristics based on their effect on nominal or ordinal dependent variables. It automatically checks all variables in the data set and creates a hierarchy showing all statistically significant subgroups. The algorithm identifies splits in the population, which are as different as possible based on a chi-square statistic. The forward stepwise procedure finds the most diverse subgroupings and then splits each subgroup further into more diverse sub-subgroups. Sample size limitations are set to avoid cells with small counts. The procedure stops when splits are no longer significant; that is, a group is homogeneous with respect to variables not yet used, or cells contain too few cases. The CHAID procedure produces a tree that identifies the set of variables and interactions among the variables that are associated with the ability to locate a sample member (and a located sample member's propensity either to respond to or to be deemed ineligible for the NBS). We first ran CHAID with all covariates and then re-ran it a few times with the top variable in the tree removed to ensure the retention of all potentially important interactions for additional consideration. We further reduced the resulting pool of covariates by evaluating tabulations of all the main effects and the interactions identified by CHAID. At a particular level of a given covariate or interaction, if all respondents were either located or unlocated (for the location models), complete or not complete (for the cooperation models), or the total number of sample members at that level was fewer than 20, the levels were collapsed if collapsing was possible. If collapsing was not possible, then we excluded the covariate or interaction from the pool.[50]

To refine further the candidate variables and interaction terms, we then processed all of the resulting candidate main effects and the interactions identified by CHAID using forward and backward stepwise regression (using the STEPWISE option of the SAS LOGISTIC procedure with weights normalized to the sample size).[51] After identifying a smaller pool of main effects and interactions for potential inclusion in the final model, we evaluated a set of models to determine the final model. Given that the SAS logistic regression procedure does not incorporate the sampling design, we relied on the logistic regression procedure in SUDAAN to make the final selection of covariates.

For selecting variables or interactions in the stepwise procedures, we included variables or interactions with a statistical significance level (alpha level) of 0.30 or lower (instead of the

[49] CHAID is normally attributed to Kass (1980) and Biggs et al. (1991), and its application in SPSS is described in Magidson (1993).

[50] Deafness historically has been shown to be an important indicator both of locating a sample member and determining whether the sample member completed the interview. For that reason, deafness remained in the covariate pool even though the number of deaf cases was sometimes as few as 18.

[51] SUDAAN offers no automated stepwise procedures; the stepwise procedures described here were performed by using SAS.

commonly used 0.05).[52] Once we determined the candidate list of main effects and interactions, we used a thorough model-fitting process to determine a parsimonious model with few very small propensities. (In Section A of this chapter, we described the model selection criteria.) In Table VI.3, we summarize the variables used in the model as main effects and interactions for locating a sample member and, in Table VI.4, for cooperation among located sample members.

Table VI.3. Location Logistic Propensity Model: Representative Beneficiary Sample

Factors in Location Model
Main Effects
MOVE (COUNT OF ADDRESSES IN SSA FILES)
PHONE (COUNT OF PHONE NUMBERS IN SSA FILES)
METRO (METROPOLITAN STATUS OF COUNTY)
REGION (CENSUS REGION)
RACE
CNTYRACE (COUNTY RACIAL/ETHNIC PROFILE)
CNTYPOPLOSS (POPULATION LOSS COUNTY)
CNTYLOWEDUC (LOW EDUCATION COUNTY)
Two- Factor Interactions
RACE*CNTYRACE

Table VI.4. Cooperation Logistic Propensity Model: Representative Beneficiary Sample

Factors in Cooperation Model
Main Effects
AGECAT (AGE CATEGORY)
RACE
HISPANICITY
METRO (METROPOLITAN STATUS OF COUNTY)
DIVISION (CENSUS DIVISION)
GENDER (SEX)
REPREPAYEE (IDENTITY OF PAYEE WITH RESPECT TO BENEFICIARY)
PDZIPSAME (WHETHER APPLICANT FOR BENEFITS LIVES IN SAME ZIP CODE AS BENEFICIARY)
MOVE (COUNT OF ADDRESSES IN SSA FILES)
PHONE (COUNT OF PHONE NUMBERS IN SSA FILES)
LIVING (LIVING SITUATION)
CNTYRACE (COUNTY RACIAL/ETHNIC PROFILE)
CNTYGOV (GOVERNMENT-DEPENDENT ECONOMY COUNTY)
Two- Factor Interactions
PDZIPSAME*PHONE
PDZIPSAME*METRO
GENDER*METRO
HISPANICITY*AGECAT
HISPANICITY*MOVE

[52] As stated, we used a higher significance level because the model's purpose was to improve the estimation of the propensity score rather than to identify statistically significant factors related to response. In addition, the information sometimes reflected proxy variables for some underlying variable that was both unknown and unmeasured.

The R-squared is 0.107 (0.275 when rescaled to have a maximum of 1) for the location model and 0.070 (0.107 when rescaled) for the cooperation model.[53] These values are similar to those observed for other response propensity modeling efforts that use logistic regression with design-based sampling weights. For the location model, 77.9 percent of pairs are concordant, 21.2 percent of pairs are discordant,[54] and the p-value for the chi-square statistic from the Hosmer-Lemeshow (H-L) goodness-of-fit test is 0.441;[55] these values indicate a reasonably good fit of the model to the data. The location adjustment from the model, calculated as the inverse of the location propensity score, ranged from 1.00 to 2.36. To ensure that the maximum did not exceed 2.0, we trimmed 26 adjustment factors so that the location adjustment ranged from 1.00 to 2.00. For the cooperation model, 59.5 percent of pairs are concordant, and 39.5 percent of pairs are discordant. The p-value for the chi-square statistic for the H-L goodness-of-fit test is 0.480 for the model. The cooperation adjustment from the model ranged from 1.02 to 3.78. To ensure that the maximum did not exceed 3.0, we trimmed five adjustment factors so that the cooperation adjustment ranged from 1.02 to 3.00. The overall nonresponse adjustment (the product of the location adjustment and the cooperation adjustment) ranged from 1.05 to 5.45.[56]

Among the variables used in the location and cooperation models shown in Tables VI.3 and VI.4, the number of levels used in the models is often fewer than the number of levels in Table VI.2; the levels collapsed for the models are described following the tables. The factors used in the location model include:

1. **MOVE.** Count of addresses in SSA files; four levels: (0) no information, (1) one address in file, (2) two addresses in file, (3) three or more addresses in file
2. **PHONE.** Count of phone numbers in SSA files; three levels: (0) no information, (1) one phone number in file, (2) two or more phone numbers in file
3. **METRO.** Urbanicity of beneficiary's place of residence; six levels: (1) beneficiary lived in metropolitan area with population of 1 million or more, (2) beneficiary lived in metropolitan area with population of 250,000 to 999,999, (3) beneficiary lived in metropolitan area with population of fewer than 250,000, (4) beneficiary lived in nonmetropolitan area adjacent to a metropolitan area of 1 million or more, (5) beneficiary lived in nonmetropolitan area adjacent to a metropolitan area of fewer than 1 million, (6) beneficiary lived in nonmetropolitan area not adjacent to metropolitan area

[53] The Generalized Coefficient of Determination (Cox and Snell 1989) is a measure of the adequacy of the model, where higher numbers indicate a greater difference between the likelihood of the model in question and the null model. The "Max Rescaled R-Square" scales this value to have a maximum of 1.

[54] A pair of observations is concordant if a responding subject has a higher predicted value than a nonresponding subject, discordant if not, and tied if both members of the pair are respondents, nonrespondents, or have the same predicted values. It is desirable to have as many concordant pairs and as few discordant pairs as possible (Agresti 1996).

[55] The Hosmer-Lemeshow Goodness-of-Fit Test is a test for goodness of fit of logistic regression models. Unlike the Pearson and deviance goodness-of-fit tests, it may be used to test goodness of fit even when some covariates are continuous (Hosmer and Lemeshow 1989).

[56] Recognizing that the Akaike's Information Criterion (AIC) is a relative number and has no meaning on its own, we do not provide values for it here.

4. **REGION.** Geographic region (based on U.S. Census divisions) of beneficiary's place of residence; two levels: (1) South, (2) all other regions
5. **RACE.** Race; two levels: (1) non–Hispanic white, (2) not white or not known to be white
6. **CNTYRACE.** County racial ethnic profile; two levels: (1) county with racially/ethnically mixed population based on 2000 Census, no majority group; (2) other racial/ethnic profile in county
7. **CNTYPOPLOSS.** County with population loss; two levels: (1) county with population loss in both 1980–1990 and 1990–2000 decennial periods, (2) county with population gain in 1980–1990 and/or 1990–2000 decennial periods
8. **CNTYLOWEDUC.** County with low education; two levels: (1) county where 25 percent or more of residents age 25 through 64 had neither a high school diploma nor Graduate Equivalency Degree (GED) in 2000, (2) county without this attribute

The model also included various interactions among these variables for locating sample members. In Table VI.3, we provide the main effects using the variable names listed above as well as interactions. In Appendix J, we provide an expanded form of Table VI.3 showing the levels of interactions shown in Table VI.3 along with parameter estimates and their standard errors. The factors used in the cooperation model include:

1. **AGECAT.** Beneficiary's age category; three levels: (1) age 18 to 29, (2) age 30 to 39, (3) age 40 to 64
2. **RACE.** Race of beneficiary; two levels: (1) non–Hispanic black, (2) not non–Hispanic black or not known to be non–Hispanic black
3. **HISPANICITY.** Whether the beneficiary was Hispanic or not; two levels: (1) Hispanic, (2) not Hispanic or unknown
4. **METRO.** Urbanicity of beneficiary's place of residence; six levels: (1) beneficiary lived in metropolitan area with population of 1 million or more, (2) beneficiary lived in metropolitan area with population between 250,000 and 1 million, (3) beneficiary lived in metropolitan area with population fewer than 250,000, (4) beneficiary lived in nonmetropolitan area adjacent to a metropolitan area of 1 million or more, (5) beneficiary lived in nonmetropolitan area adjacent to a metropolitan area of fewer than 1 million, (6) beneficiary lived in nonmetropolitan area not adjacent to metropolitan area
5. **DIVISION.** Geographic region (based on U.S. Census divisions) of beneficiary's place of residence; three levels: (1) New England, (2) West North Central), (3) all other Census divisions
6. **GENDER (SEX).** Two levels: (1) male, (2) female
7. **REPREPAYEE.** The identity of the payee with respect to the beneficiary; two levels: (1) beneficiary received benefit payments himself or herself, (2) beneficiary received benefit payments from a family member, an institution received payments on behalf of beneficiary, or identity of payee not known
8. **PDZIPSAME.** Whether the beneficiary and the applicant for benefits lived in the same ZIP code; two levels: (1) beneficiary and applicant lived in same ZIP code, (2) beneficiary and applicant lived in different ZIP codes/information unknown

9. **MOVE.** Count of addresses in SSA files; four levels: (0) no information, (1) one address in file, (2) two addresses in file, (3) three or more addresses in file
10. **PHONE.** Count of phone numbers in SSA files; three levels: (0) no information, (1) one phone number in file, (2) two or more phone numbers in file
11. **LIVING.** Beneficiary's living situation: two levels: (1) beneficiary lives in institution, (2) beneficiary lives alone, with others, with parents, or living situation unknown
12. **CNTYRACE.** County racial ethnic profile; two levels: (1) county with racially/ethnically mixed population based on 2000 Census, no majority group; (2) other racial/ethnic profile in county
13. **CNTYGOV.** County with government-dependent economy; two levels: (1) 15 percent or more of average annual labor and proprietors' earnings derived from Federal and state government during 1998–2000, (2) county without this attribute

Once again, we included various interactions among these variables in the model for the cooperation of sample members. In Table VI.4, we provide the main effects using the variable names as well as interactions. In Appendix J, we provide an expanded form of Table VI.4, with the levels of the interactions shown in Table VI.4, along with parameter estimates and their standard errors.

After we applied adjustments to the sampling weights, we reviewed the distribution of weights to determine the need for further trimming of the weights. We concluded that no additional trimming was needed and that the maximum design effect attributable to unequal weighting was 1.10, observed with the third-oldest age group stratum.

3. Post-Stratification

Post-stratification is the procedure that aligns the weighted sums of the response-adjusted weights to known totals external to the survey. The process offers face-validity for reporting population counts and has some statistical benefits. For the Representative Beneficiary Sample, we post-stratified to the 24 population totals obtained from SSA.[57] In particular, the totals were the total number of SSI/SSDI beneficiaries by age (four categories), gender, and recipient status (SSI only, SSDI only, and both). We conducted no trimming after post-stratification.

C. Ticket Participant Sample

As noted earlier, we selected the Ticket Participant Sample from the Round 4 population of Ticket-to-Work participants, a subset of all SSI/SSDI beneficiaries, and partitioned the sample according to the provider-payment types in the Ticket-To-Work payment system (traditional SVRAs, SVRA ENs, and non–SVRA ENs). Participants with Tickets assigned to an SVRA receiving traditional CR payments accounted for 81 percent (68,592 of 85,038) of participants at the time of sampling frame development. The number of participants with Tickets assigned to SVRAs functioning as ENs under TTW totaled 12,728 (15 percent). The number of participants with

[57] We obtained these totals from a frame file provided by SSA, giving information on basic demographics for all SSI and SSDI beneficiaries. The totals excluded 185,840 beneficiaries from Puerto Rico and outlying territories.

Tickets assigned to non–SVRA ENs totaled only 3,718 (4 percent).[58] As also noted earlier, the PSUs in the initial sampling design did not contain a sufficient number of participants with Tickets assigned to non–SVRSA ENS and SVRAs functioning as ENs to support analysis tasks. As a result, we supplemented the clustered sample, which consisted of respondents selected within the initial sample design, by randomly selecting a sample from the entire population of participants with Tickets assigned to ENs (non–SVRA ENs and SVRAs functioning).

Given that the clustered sample was part of the original sample design, we selected all respondents in the clustered sample from PSUs, whereas the unclustered sample included units that may or may not have been in the selected PSUs. We therefore organized the unclustered sample into two strata: in the PSU or not in the PSU. In most cases, respondents selected for the in-PSU stratum of the unclustered sample were also in the clustered sample. The weights for such duplicate cases had to be adjusted appropriately to account for a single respondent's appearance in two independent samples. (In the next subsection, we discuss the compositing scheme used to make the needed adjustments.) In addition, if the central office[59] could not locate sample members based on sample frame information, it treated them differently in the clustered and unclustered samples. For the clustered sample, the central office sent sample cases that they could not locate by telephone to the field for further follow-up for attempted personal interviews. In the unclustered sample, interviewers made no further attempt to locate potential respondents who could not be located by the central office. This process is analogous to the accepted practice of subsampling nonrespondents for more intensive effort—in this case, we subsampled cases in the clustered sample for field follow-up, but did not follow up unlocated cases in the unclustered sample. . When creating composite weights (described in the next section), we zeroed out the weights for the unlocated cases in the unclustered sample.[60] In Table VI.5, we present the final sample sizes for the Ticket Participant Sample.

As indicated, for the clustered samples for Ticket participants (traditional, Non-SVRA EN clustered, and SVRA EN clustered), we allocated the sample across the 79 PSUs, with the Los Angeles PSU receiving a double allocation because it had two selections. Given the smaller population sizes for Ticket participants when compared to the broader beneficiary population, we used only the full PSUs; we did not use the SSUs in the Los Angeles PSU (four SSUs) or the Cook County (Chicago) PSU (two SSUs), which were used for the Representative Beneficiary Sample.

[58] These totals exclude 207 participants who resided in Puerto Rico or other outlying territories (the target population was limited to the 50 States and the District of Columbia). Of these 207 participants, 8 relied on the traditional payment system, 19 on SVRAs acting as ENs, and 180 on non–SVRA ENs.

[59] The central office is the Mathematica Survey Operations Center.

[60] If a sample member selected as part of both the clustered and unclustered samples, was sent to the field for further follow-up and was then located in the field, the response had to be treated differently between the two samples. For the sample respondent, the value in the clustered sample was recorded according to its final status in the field, whereas the value in the unclustered sample was recorded as "not selected for field follow-up." If such a case was duplicated in the clustered sample, the clustered sample case kept its original weight, appropriately adjusted so that the sum of the weights remained the same.

Table VI.5. Survey Population and Initial Augmented and Final Sample Sizes, by Sampling Strata in the Participant Survey

Sampling Strata (Payment System/ Provider Type)	Survey Population[a]	Initial Augmented Sample Size[b]	Released Sample
Total Participants	85,038	11,863	4,334
1. Traditional payment type	68,592	3,069	1,083
2. Non–SVRA ENs		6,118	2,157
Clustered sample	12,728	2,818	1,049
Unclustered sample	12,728	3,300	1,108
In PSUs	3,084	788	273
Not in PSUs	9,644	2,512	835
3. SVRA ENs		2,676	1,094
Clustered sample	3,718	426	320
Unclustered sample	3,718	2,250	774
In PSUs	426	256	100
Not in PSUs	3,292	1,994	674

Source: Sample allocation and counts computed by Mathematica.

[a] This column reflects weighted totals before compositing. The totals exclude 207 participants who lived in Puerto Rico or other outlying territories (the target population was limited to the 50 states and the District of Columbia).

[b] The initial (augmented) and final (released) sample sizes include participants for whom the number obtained from the original sample design was insufficient for analysis. For participants using either SVRAs acting as ENs or non-SVRA ENs, we used a paired sample design, whereby participants in the PSUs could potentially be selected for both samples.

1. Initial Weights

We computed the initial weights based on the probability of selection within the PSU of the augmented sample and the probability of selection for the PSU. For the unclustered sample, among participants with Tickets assigned to SVRAs functioning as ENs or to non–SVRA ENs, we computed the initial weights based on the selection probability within the two sampling strata (in one PSU or not in any PSU). With only a portion of the augmented sample released for use, we then adjusted the initial weights for the sample used in the survey.

2. Dual-Frame Estimation

To obtain estimates for the SVRA and non–SVRA Ticket Participant subsamples, we had to use a "paired sample design" that combined the clustered and unclustered samples while accounting for different follow-up rules. The design required the creation of composite weights for application to the combined samples. As noted, if the central office could not locate a sample member in the unclustered sample, the office determined that the individual was "not selected for field followup" and thus undertook no further locating efforts. However, if the central office could not locate a sample member in the clustered sample, the case went to the field for additional locating efforts (field follow-up).

a. Conceptual Framework for Composite Weights

Consider a survey estimate, Est(Y), such as the proportion currently working, that is computed using information from two independent samples, such as the clustered and unclustered samples described above. To compute this estimate, the two samples may not be combined without first adjusting the weights because the clustered and unclustered samples in the Ticket Participant Sample represent the same target population among Ticket participants. Separate estimates may be

computed from each sample, within each payment type, and then combined by using the following equation:

$$\mathrm{Est}(\mathrm{Y}) = \lambda \mathrm{Y}(\mathrm{clustered}) + (1-\lambda)\mathrm{Y}(\mathrm{unclustered}) \quad (1)$$

where *Y(clustered)* is the survey estimate from the clustered sample for the given payment type, *Y(unclustered)* is the survey estimate from the unclustered sample for the given payment type, and λ is an arbitrary constant between 0 and 1. For example, for participants with Tickets assigned to SVRAs functioning as ENs in the Round 4 data, the clustered sample accounted for 232 respondents and the unclustered sample for 446 respondents. The estimates to be combined are the proportion of the 232 in the clustered sample who are currently working and the proportion of the 446 in the unclustered sample who are currently working. In practice, of course, the calculation is more complicated because we need to account for the different rules used in the two samples for following up with nonrespondents or unlocated sample members (discussed later). For the sampling variance, *V(Y)*, the estimate is computed with the following equation:

$$\mathrm{V}(\mathrm{Y}) = \lambda 2\mathrm{V}(\mathrm{Y}(\mathrm{clustered})) + (1-\lambda)2\mathrm{V}(\mathrm{Y}(\mathrm{unclustered})) \quad (2)$$

where *V(Y(clustered))* is the sampling variance for the estimate from the clustered sample, and *V(Y(unclustered))* is the sampling variance for the estimate from the unclustered sample. Any value of λ will result in an unbiased estimate of the survey estimate, but not necessarily an estimate with the minimum sampling variance. A lambda value producing a sampling variance at its minimum value results in the shortest confidence interval and, by implication, the most precise point estimate.

A value of lambda that minimizes the variance may be calculated as:

$$\begin{aligned} \lambda &= 1/\mathrm{V}(\mathrm{Y}(\mathrm{clustered})/[1/\mathrm{V}(\mathrm{Y}(\mathrm{clustered})) + 1/\mathrm{V}(\mathrm{Y}(\mathrm{unclustered}))]) \\ &= \mathrm{V}(\mathrm{Y}(\mathrm{unclustered}))/[\mathrm{V}(\mathrm{Y}(\mathrm{clustered})) + \mathrm{V}(\mathrm{Y}(\mathrm{unclustered}))] \end{aligned} \quad (3)$$

In this case, the minimum variance is:

$$\mathrm{V}(\mathrm{Y}) = [\mathrm{V}(\mathrm{Y}(\mathrm{clustered})) * \mathrm{V}(\mathrm{Y}(\mathrm{unclustered}))]/[\mathrm{V}(\mathrm{Y}(\mathrm{clustered})) + \mathrm{V}(\mathrm{Y}(\mathrm{unclustered}))] \quad (4)$$

To compute the combined-sample estimate with minimum variance, we derive survey estimates by first computing the estimates for each sample, computing a value of λ for each pair of estimates, and then combining the point and variance estimates. While this process produces minimum variance estimates, it is computer-intensive and results in some inconsistencies among estimates for percentages and proportions because of different values of λ among levels of categorical variables.

Since Round 2, we have used an alternative approach that identifies a single lambda calculated by using sample sizes and design effects attributable to unequal weighting for the two samples. In particular, λ acts as a weighting factor, with more weight given to the larger sample. The formula for λ includes sample sizes adjusted for the design effect attributable to unequal weighting. The formula for λ follows:

$$\lambda = \frac{n(clustered)/deff\,(clustered)}{n(clustered)/deff\,(clustered) + n(unclustered)/deff\,(unclustered)} \quad (5)$$

where *n(clustered)* and *n(unclustered)* are the sample sizes of the clustered and unclustered central office–located samples, respectively, and *deff(clustered)* and *deff(unclustered)* are the design effects attributable to unequal weighting for the clustered and unclustered central office–located samples, respectively.

b. Application of Composite Weights to Ticket Participant Sample

The population of participants in the relevant payment type may be separated into two parts: the portion requiring field follow-up and the portion not requiring field follow-up. For the latter portion (that is, those who may be located through the central office's locating efforts), both the clustered and unclustered samples are independent samples that can provide unbiased estimates for this subpopulation. However, for the portion of the target population requiring field follow-up (that is, those who may not be located through the central office's locating efforts), only the clustered sample can provide unbiased estimates for this subpopulation because unclustered sample cases were not eligible for field follow-up.

For the subpopulation that may be located by the central office, the clustered and unclustered samples may be combined by using the compositing method (called a "dual frame" estimation procedure). The following equation computes the composite weight for each sample member in the clustered central office–located sample:

$$WT = \lambda\ WT\,(\text{clustered central office-located sample weight}) \quad (6)$$

For units in the unclustered central office–located sample, the following equation computes the composite weight for each sample member in the unclustered central office–located sample:

$$WT = (1-\lambda)WT\,(\text{unclustered central office-located sample weight}) \quad (7)$$

Conversely, for the subpopulation of persons not found through the central office's locating efforts, only the clustered sample may be used. In this case, no combining is required, and we used the clustered weight directly as follows:

$$WT = 1 * WT\,(\text{clustered field-located sample weight}) \quad (8)$$

We adjusted the sum of weights among field-located cases in the clustered sample so that the total sum matched the original total sum. Given that the weights for each subpopulation sum to the total number of individuals in each subpopulation, the two subpopulations may simply be combined to form the entire target population.

With the paucity of sample members in the PSUs in some cases, the unclustered sample was often much larger than the clustered sample. Therefore, combining samples and creating composite weights sometimes resulted in weights with unacceptably high levels of variation and necessitated trimming to reduce such variation (described later).

3. Nonresponse Adjustment

As with the Representative Beneficiary Survey, we adjusted the sampling weights in two stages: one stage for sample members who could not be located and another stage for those who, once located, refused to respond. For the Ticket Participant Sample, we calculated the nonresponse adjustments (including both the location and cooperation adjustments) for all three provider-payment-type subpopulations by using logistic propensity models. For participants with Tickets assigned to either SVRAs functioning as ENs or non–SVRA ENs, we applied the nonresponse adjustments to the composite weights for the clustered and unclustered samples. Roughly equal sample sizes with vastly different population sizes for the three provider-payment types resulted in substantial differences in the magnitude of the weights. Thus, we calculated separate adjustments for each of the three subpopulations, first for the location adjustment and subsequently for the cooperation adjustment. The result was six weight adjustments, including the three location adjustments for the three participant subpopulations, and three cooperation adjustments for the same three subpopulations, by using logistic propensity models. The models were fitted in the same way as the adjustment models for the Representative Beneficiary Sample (Section B.2 of this chapter).

As with the Representative Beneficiary Sample, we wanted to limit the value of the location adjustment to less than 2.0 and the value of the response adjustment to 3.0. We defined a single trimming class for each model.[61] The main factors or attributes affecting our ability to locate and interview Ticket Participant sample members included the same factors as those used to locate and interview Representative Beneficiary sample members: personal characteristics of the sample member (race, ethnicity, gender, and age), identity of the payee with respect to the beneficiary, whether the beneficiary and the applicant for benefits lived in the same location, how many phones or addresses are in the SSA files for the beneficiary, beneficiary's living situation, and geographic characteristics, including attributes of the county where the beneficiary resides. In addition, the following factors or attributes affected our ability to locate and interview Ticket Participant Sample members: type of beneficiary (recipient of SSI, SSDI, or both), primary disability, and type of disability claim (a person with a disability, a survivor, or other). In subsequent sections, we describe how the specific covariates for each of the six weight adjustments varied.

a. Coding of Survey Dispositions

The scheme used to code respondents included the four general categories described in Section B.2: eligible respondents, ineligible respondents, located nonrespondents, and unlocated sample members.[62]

[61] Across the three Ticket participant subpopulations, we trimmed 11 location adjustment factors and 4 cooperation adjustment factors (details in Section C.2.d of this chapter).

[62] Disposition codes 420 (institutionalized) and 430 (unavailable during field period) were classified as nonrespondent codes in Round 4, even though they were considered ineligible codes in Round 1. This classification affected one case in the Round 4 Ticket Participant Sample. As a result, the nonresponse adjusted weight for the case was 0 in Round 4, even though a similar response in Round 1 would have resulted in a positive weight. Because of the small numbers, the effect on response rates was noticeably small.

b. Response Rates

The 71.4 percent response rate for the Ticket Participant Sample is the product of the weighted location rate and weighted completion rate among located sample members. The weighted location rate is 93.1 percent, and the weighted cooperation rate (the weighted completion rate among located sample members) is 76.6 percent. Analogous to the Representative Beneficiary Sample, the weighted rates are used because the sampling weights vary substantially across the sampling strata, and the weighted rates better reflect the potential for nonresponse bias.

c. Factors Related to Location and Response

In Tables VI.6 through VI.8, we provide information on selected factors associated with locating a sample member within each of the three provider-payment-type subpopulations and the factors associated with the response among located sample members. The tables include unweighted counts of all sample members, counts of located sample members, and counts of sample members from whom we obtained a completed interview or whom we deemed ineligible. The tables also include the weighted location rate, weighted completion rate among located sample members, and weighted overall completion rate for these factors, which helped inform the decision about the final set of variables to be used to define the weighting classes and to be applied in the nonresponse adjustment models.

Table VI.6. Weighted Location and Response Rates for the Ticket Participant Sample, SVRA ENs, by Selected Characteristics

	Sample	Located Sample		Response Among Located Sample		Overall Respondents
	Count	Count	Location Rate	Count	Response Rate	Response Rate
All	958[a]	909	90.0	693	77.0	69.0
SSI Only, SSDI Only, or Both SSI and SSDI						
SSI only	247	228	87.0	173	77.6	67.5
SSDI only	437	417	90.6	317	75.5	68.1
Both SSI and SSDI	274	264	91.9	203	78.7	71.7
SSI or SSDI						
SSI only or both SSI and SSDI	521	492	89.6	376	78.2	69.7
SSDI only or both SSI and SSDI	711	681	91.1	520	76.8	69.5
Constructed Disability Status						
Deaf	31	28	91.3	13	43.2	40.2
Mental	610	578	88.4	453	78.9	69.3
Physical	310	296	92.9	222	76.8	70.9
Unknown	7	7	100.0	5	71.1	65.4
Beneficiary's Age (four categories)						
18 to 29	271	255	91.9	188	76.3	69.4
30 to 39	177	164	81.4	124	72.5	59.4
40 to 49	237	228	94.1	175	76.5	72.1
50 and older	273	262	90.9	206	81.0	72.7
Sex						
Male	496	473	91.0	366	78.8	71.2
Female	462	436	89.0	327	75.0	66.6

Table VI.6 *(continued)*

	Sample	Located Sample		Response Among Located Sample		Overall Respondents
	Count	Count	Location Rate	Count	Response Rate	Response Rate
Hispanicity						
Hispanic	7	7	100.0	5	87.2	88.2
Non–Hispanic/unknown	951	902	90.0	688	76.9	68.9
Race						
White	626	598	91.8	452	75.8	69.6
Black	211	196	83.1	159	80.7	65.9
Unknown	110	105	92.5	73	74.3	68.0
Asian American, Pacific Islander, North American Indian, or Alaskan Native	3	3	100.0	2	74.0	71.4
	8	7	92.6	7	100.0	92.6
Living Situation						
Living alone	608	572	88.6	432	77.2	68.0
Living with others	69	67	92.8	50	75.2	68.7
In institution or unknown	281	270	92.6	211	77.0	71.2
Did the Applicant for Benefits Live in Same ZIP Code as the Beneficiary?						
No	79	71	77.2	56	80.9	61.9
Yes	646	616	90.6	471	78.2	70.3
No information	233	222	94.5	166	71.8	68.1
Identity of the Payee with Respect to the Beneficiary						
Beneficiary received beneficiary payments himself or herself	49	44	82.4	36	81.3	65.9
Payee is a family member	265	249	91.9	196	80.5	73.6
Payee is an institution	78	76	97.4	58	77.6	75.2
Other	566	540	88.7	403	75.0	66.2
Count of Phone Numbers in File						
Only one phone number in file	18	18	100.0	15	86.5	86.1
Two phone numbers in file	154	148	93.9	110	76.7	70.6
Three phone numbers in file	62	55	79.1	38	69.6	55.0
Four phone numbers in file	62	55	87.0	39	77.0	65.6
Five or more phone numbers in file	140	125	76.2	88	72.5	54.5
No information	522	508	97.0	403	79.7	77.2
Count of Addresses in File						
Only one address in file	544	527	94.0	415	78.9	73.8
Two addresses in file	247	231	87.2	172	75.4	65.0
Three or more addresses in file	70	56	71.6	33	68.2	48.1
No information	97	95	96.0	73	79.4	76.1
Type of Claim						
Survivor	65	62	90.7	46	72.4	65.6
Disabled	653	626	91.3	480	77.4	70.3
Unknown	240	221	86.3	167	77.1	66.3
Census Region						
Midwest	696	659	91.6	505	76.9	70.4
Northeast	115	108	93.5	78	72.2	67.8
South	140	135	81.1	105	81.0	64.2
West	7	7	100.0	5	69.1	67.5

Table VI.6 *(continued)*

	Sample	Located Sample		Response Among Located Sample		Overall Respondents
	Count	Count	Location Rate	Count	Response Rate	Response Rate
Census Division						
East North Central	385	369	93.6	287	77.7	72.8
East South Central	5	5	100.0	4	78.8	80.0
Middle Atlantic	2	2	100.0	2	100.0	100.0
Mountain	5	5	100.0	3	56.8	58.7
New England	113	106	93.4	76	71.7	67.1
Pacific	2	2	100.0	2	100.0	100.0
South Atlantic	103	98	76.9	76	81.1	60.6
West North Central	311	290	89.9	218	76.1	68.3
West South Central	32	32	100.0	25	80.9	80.4
Metropolitan						
Metropolitan areas of 1 million population or more	303	290	85.6	220	75.8	63.4
Metropolitan areas of 250,000 to 999,999 population	268	250	85.8	191	75.3	64.8
Metropolitan areas of fewer than 250,000 population	133	127	94.8	96	79.2	74.7
Nonmetropolitan areas adjacent to large metropolitan areas	24	22	91.5	17	75.7	70.8
Nonmetropolitan areas adjacent to medium or small metropolitan areas	124	120	96.9	91	77.3	74.8
Nonmetropolitan areas not adjacent to metropolitan areas	106	100	94.1	78	80.4	75.5
County with Low Education						
Yes	34	31	55.1	27	93.0	50.0
No	924	878	92.6	666	76.0	70.3
County with Housing Stress						
Yes	86	81	73.0	63	82.5	57.9
No	872	828	92.4	630	76.3	70.5
Population Loss County						
Yes	210	202	94.2	157	75.7	71.2
No	748	707	89.3	536	77.2	68.6
Retirement Destination County						
Yes	54	52	96.5	41	77.5	75.6
No	904	857	89.6	652	77.0	68.5
Service- Dependent Economy County						
Yes	269	260	95.3	193	72.1	68.3
No	689	649	88.5	500	78.4	69.2
Nonspecialized- Dependent Economy County						
Yes	325	300	87.4	225	75.4	65.8
No	633	609	91.4	468	77.9	70.7
Government- Dependent Economy County						
Yes	68	64	94.1	56	86.6	82.4
No	890	845	89.7	637	76.2	67.9

Table VI.6 *(continued)*

	Sample	Located Sample		Response Among Located Sample		Overall Respondents
	Count	Count	Location Rate	Count	Response Rate	Response Rate
County Racial/Ethnic Profile						
County with at least 90% non-Hispanic white population	363	333	87.9	254	76.9	67.6
County with plurality or majority Hispanic population	5	5	100.0	3	54.8	54.4
County with majority but fewer than 90% non-Hispanic white population	369	359	97.1	270	76.0	74.0
County with a racially/ethnically mixed population, no majority group	200	191	79.9	151	80.1	62.4
County with plurality or majority non-Hispanic black population	19	19	100.0	14	74.3	73.7
County with at least 20% American Indian population	2	2	100.0	1	49.9	50.0
Phase						
Phase 1	220	208	93.8	157	77.6	72.4
Phase 2	203	195	85.3	148	78.7	66.1
Phase 3	535	506	90.4	388	75.8	68.5

Source: NBS, Round 4.

[a] Total does not include 136 unclustered cases that were not followed up in the field.

Table VI.7. Weighted Location and Response Rates for the Ticket Participant Sample, Non- SVRA ENs, by Selected Characteristics

	Sample	Located Sample		Response Among Located Sample		Overall Respondents
	Count	Count	Location Rate	Count	Response Rate	Response Rate
All	1,939[a]	1,824	93.2	1,399	76.1	71.3
SSI Only, SSDI Only, or Both SSI and SSDI						
SSI only	425	385	89.2	283	74.4	66.7
SSDI only	1,048	1,002	94.9	794	78.9	75.3
Both SSI and SSDI	466	437	92.9	322	71.4	66.5
SSI or SSDI						
SSI only or both SSI and SSDI	891	822	91.2	605	72.8	66.6
SSDI only or both SSI and SSDI	1,514	1,439	94.3	1,116	76.6	72.6
Constructed Disability Status						
Deaf	18	14	79.3	7	48.7	38.8
Mental	962	894	91.7	664	73.8	68.2
Physical	940	897	94.7	712	78.7	74.8
Unknown	19	19	100.0	16	84.0	83.8
Beneficiary's Age (four categories)						
18 to 29	332	305	92.2	220	72.9	67.5
30 to 39	370	345	91.5	258	73.6	68.0
40 to 49	503	479	93.8	365	74.7	70.3
50 and older	734	695	94.1	556	80.0	75.5

Table VI.7 *(continued)*

	Sample	Located Sample		Response Among Located Sample		Overall Respondents
	Count	Count	Location Rate	Count	Response Rate	Response Rate
Sex						
Male	992	927	92.4	709	76.5	71.0
Female	947	897	93.9	690	75.8	71.6
Hispanicity						
Hispanic	98	93	92.2	75	80.3	75.3
Non-Hispanic/unknown	1,841	1,731	93.2	1,324	75.9	71.1
Race						
White	895	848	94.5	654	76.2	72.7
Black	700	654	91.9	500	77.1	70.8
Unknown	326	306	92.1	235	74.2	68.9
Asian American, Pacific Islander,	16	14	91.2	8	60.1	53.8
North American Indian, or Alaskan Native	2	2	100.0	2	100.0	100.0
Living Situation						
Living alone	1,091	1,017	92.6	770	75.3	70.2
Living with others	131	121	89.4	87	71.4	63.9
Living with parents	6	5	79.1	2	50.9	41.7
In institution or unknown	711	681	94.8	540	78.5	74.7
Did the Applicant for Benefits Live in Same ZIP Code as the Beneficiary?						
No	201	184	90.3	129	71.9	65.0
Yes	1,252	1,175	92.8	903	76.2	71.0
No information	486	465	95.4	367	77.8	74.7
Identity of the Payee with Respect to the Beneficiary						
Beneficiary received beneficiary payments himself or herself	93	84	89.0	68	81.6	72.9
Payee is a family member	355	335	93.4	239	70.5	66.3
Payee is an institution	57	54	93.4	38	69.6	65.8
Other	1,434	1,351	93.3	1,054	77.5	72.7
Count of Telephone Numbers in File						
Only one phone number in file	19	19	100.0	14	78.0	77.7
Two phone numbers in file	280	271	97.3	209	75.6	73.6
Three phone numbers in file	145	133	90.1	92	68.1	61.6
Four phone numbers in file	101	91	91.6	64	68.7	63.7
Five or more phone numbers in file	399	340	84.4	250	73.3	62.3
No information	995	970	97.6	770	80.3	78.4
Count of Addresses in File						
Only one address in file	1,012	975	96.2	780	79.9	76.9
Two addresses in file	639	602	93.2	442	72.4	67.7
Three or more addresses in file	172	134	76.6	83	65.8	50.6
No information	116	113	97.7	94	85.4	83.3
Type of Claim						
Survivor	76	70	91.3	51	74.2	68.6
Disabled	1,457	1,387	94.4	1,078	76.8	72.8
Unknown	406	367	89.2	270	74.2	66.4

Table VI.7 *(continued)*

	Sample	Located Sample		Response Among Located Sample		Overall Respondents
	Count	Count	Location Rate	Count	Response Rate	Response Rate
Census Region						
Midwest	321	306	94.5	240	79.6	75.3
Northeast	326	307	92.8	234	75.2	70.7
South	805	755	92.8	586	76.7	71.4
West	487	456	93.1	339	72.9	68.4
Census Division						
East North Central	255	243	94.2	191	79.0	74.5
East South Central	91	88	94.2	72	78.6	74.3
Middle Atlantic	199	192	95.6	150	80.3	76.6
Mountain	143	138	95.5	104	72.4	69.4
New England	127	115	88.3	84	67.1	61.1
Pacific	344	318	91.9	235	73.1	67.9
South Atlantic	535	500	92.5	380	75.1	69.7
West North Central	66	63	95.2	49	81.4	77.6
West South Central	179	167	92.8	134	80.1	74.5
Metropolitan						
Metropolitan areas of 1 million population or more	1,237	1,163	93.0	879	75.9	70.8
Metropolitan areas of 250,000 to 999,999 population	472	438	91.3	340	73.9	68.5
Metropolitan areas of fewer than 250,000 population	118	113	94.4	89	78.5	74.1
Nonmetropolitan areas adjacent to large metropolitan areas	26	25	94.1	22	83.7	78.2
Nonmetropolitan areas adjacent to medium or small metropolitan areas	53	53	100.0	42	78.8	79.2
Nonmetropolitan areas not adjacent to metropolitan areas	33	32	97.9	27	83.6	81.7
County with Low Education						
Yes	337	312	92.2	233	74.8	69.2
No	1,602	1,512	93.4	1,166	76.4	71.7
County with Housing Stress						
Yes	1,099	1,029	92.9	776	75.2	70.1
No	840	795	93.5	623	77.1	72.6
Population Loss County						
Yes	212	201	93.9	149	77.4	72.2
No	1,727	1,623	93.1	1,250	76.0	71.2
Retirement Destination County						
Yes	240	231	94.6	180	76.3	72.6
No	1,699	1,593	92.9	1,219	76.1	71.1
Service- Dependent Economy County						
Yes	1,195	1,113	91.7	838	73.6	67.7
No	744	711	94.9	561	79.2	75.6
Nonspecialized- Dependent Economy County	321	305	94.8	250	83.5	79.3
Yes	1,618	1,519	92.8	1,149	74.4	69.4
No						

Table VI.7 *(continued)*

	Sample	Located Sample		Response Among Located Sample		Overall Respondents
	Count	Count	Location Rate	Count	Response Rate	Response Rate
Government- Dependent Economy County						
Yes	184	175	95.3	138	78.9	75.5
No	1,755	1,649	92.9	1,261	75.8	70.8
County Racial/Ethnic Profile						
County with at least 90% non-Hispanic white population	106	103	96.9	82	81.4	79.2
County with plurality or majority Hispanic population	278	261	93.1	198	74.8	70.3
County with majority but fewer than 90% non-Hispanic white population	621	589	93.3	464	76.6	71.9
County with a racially/ethnically mixed population, no majority group	813	761	93.0	572	74.8	69.8
County with plurality or majority non-Hispanic black population	119	108	88.5	81	78.0	68.6
County with at least 20% American Indian population	2	2	100.0	2	100.0	100.0
Phase						
Phase 1	713	669	93.0	510	75.3	70.2
Phase 2	408	387	93.2	310	79.3	74.6
Phase 3	818	768	93.3	579	75.0	70.2

Source: NBS, Round 4.

[a] Total does not include 218 unclustered cases that were not followed up in the field.

Table VI.8. Weighted Location and Response Rates for the Ticket Participant Sample, Traditional Payment System, by Selected Characteristics

	Sample	Located Sample		Response Among Located Sample		Overall Respondents
	Count	Count	Location Rate	Count	Response Rate	Response Rate
All	1,083	1,009	93.3	765	76.3	71.5
SSI Only, SSDI Only, or Both SSI and SSDI						
SSI only	373	343	92.1	257	75.8	70.0
SSDI only	434	406	93.5	313	77.5	72.9
Both SSI and SSDI	276	260	94.3	195	74.9	71.1
SSI or SSDI						
SSI only or both SSI and SSDI	649	603	93.1	452	75.4	70.5
SSDI only or both SSI and SSDI	710	666	93.8	508	76.5	72.2
Constructed Disability Status						
Deaf	47	41	88.2	25	61.2	55.2
Mental	623	584	93.8	443	76.0	71.8
Physical	400	372	93.0	285	77.5	72.1
Unknown	13	12	93.0	12	100.0	93.0

Table VI.8 *(continued)*

	Sample	Located Sample		Response Among Located Sample		Overall Respondents
	Count	Count	Location Rate	Count	Response Rate	Response Rate
Beneficiary's Age (four categories)						
18 to 29	363	335	92.3	258	77.3	72.0
30 to 39	171	156	91.4	111	71.4	65.4
40 to 49	273	257	94.2	201	78.7	74.4
50 and older	276	261	94.7	195	75.5	71.6
Sex						
Male	596	557	93.5	424	76.9	72.1
Female	487	452	93.0	341	75.5	70.8
Hispanicity						
Hispanic	75	67	89.7	50	75.8	67.7
Non-Hispanic/unknown	1,008	942	93.5	715	76.3	71.7
Race						
White	630	586	93.1	435	74.9	69.8
Black	199	189	95.0	157	84.3	80.1
Unknown	244	226	92.9	168	74.1	69.8
Asian American, Pacific Islander,	6	5	84.7	4	73.4	62.3
North American Indian, or Alaskan Native	4	3	74.3	1	27.8	24.8
Living Situation						
Living alone	686	630	92.0	476	76.0	70.2
Living with others	116	113	97.3	85	75.6	74.1
Living with parents	11	10	90.6	7	73.4	66.0
In institution or unknown	270	256	94.8	197	77.3	73.8
Did the Applicant for Benefits Live in Same ZIP Code as the Beneficiary?						
No	123	113	92.3	76	67.6	62.6
Yes	713	668	93.8	517	77.8	73.4
No information	247	228	92.2	172	76.0	70.3
Identity of the Payee with Respect to the Beneficiary						
Beneficiary received beneficiary payments himself or herself	45	42	93.0	33	77.8	73.1
Payee is a family member	364	348	95.7	261	76.0	73.0
Payee is an institution	67	58	86.8	45	78.8	67.3
Other	607	561	92.6	426	76.0	70.9
Count of Phone Numbers in File						
Only one phone number in file	21	21	100.0	17	81.4	81.7
Two phone numbers in file	168	160	95.5	130	81.5	78.1
Three phone numbers in file	90	85	94.5	65	77.6	74.0
Four phone numbers in file	84	71	84.1	54	76.5	64.5
Five or more phone numbers in file	227	192	84.6	145	75.3	64.5
No information	493	480	97.4	354	74.4	72.7
Count of Addresses in File						
Only one address in file	588	571	97.2	464	82.2	79.9
Two addresses in file	325	298	91.7	215	73.2	66.7
Three or more addresses in file	125	98	79.0	58	59.6	47.3
No information	45	42	93.0	28	67.2	62.4

Table VI.8 *(continued)*

	Sample	Located Sample		Response Among Located Sample		Overall Respondents
	Count	Count	Location Rate	Count	Response Rate	Response Rate
Type of Claim						
Survivor	78	75	96.3	52	71.7	68.4
Disabled	642	601	93.6	465	77.4	72.9
Unknown	363	333	91.9	248	75.3	69.5
Census Region						
Midwest	234	216	92.5	171	78.9	73.6
Northeast	196	183	93.7	134	74.6	70.1
South	381	360	94.5	269	75.7	71.6
West	272	250	92.0	191	75.8	70.2
Census Division						
East North Central	168	157	93.6	124	78.3	74.2
East South Central	55	54	98.0	33	63.8	63.1
Middle Atlantic	129	117	90.8	79	69.1	63.0
Mountain	75	69	92.0	54	76.7	71.9
New England	67	66	98.5	55	83.1	82.0
Pacific	197	181	91.9	137	75.5	69.5
South Atlantic	200	184	92.2	140	76.7	70.7
West North Central	66	59	89.7	47	80.4	72.1
West South Central	126	122	96.7	96	79.3	76.8
Metropolitan						
Metropolitan areas of 1 million population or more	451	422	93.6	316	75.3	70.7
Metropolitan areas of 250,000 to 999,999 population	293	267	91.4	202	76.1	69.7
Metropolitan areas of fewer than 250,000 population	204	193	94.5	148	77.8	73.9
Nonmetropolitan areas adjacent to large metropolitan areas	54	51	94.7	42	82.5	78.4
Nonmetropolitan areas adjacent to medium or small metropolitan areas	29	28	96.8	23	79.0	79.2
Nonmetropolitan areas not adjacent to metropolitan areas	52	48	92.2	34	71.5	66.8
County with Low Education						
Yes	146	137	93.8	93	68.4	64.2
No	937	872	93.2	672	77.4	72.5
County with Housing Stress						
Yes	515	479	93.0	363	76.2	71.2
No	568	530	93.5	402	76.3	71.7
Population Loss County						
Yes	97	87	90.3	61	69.9	63.7
No	986	922	93.5	704	76.9	72.2
Retirement Destination County						
Yes	160	147	91.7	108	74.1	68.1
No	923	862	93.5	657	76.6	72.0
Service- Dependent Economy County						
Yes	500	464	92.9	352	76.4	71.4
No	583	545	93.5	413	76.2	71.6

Table VI.8 *(continued)*

	Sample	Located Sample		Response Among Located Sample		Overall Respondents
	Count	Count	Location Rate	Count	Response Rate	Response Rate
Nonspecialized- Dependent Economy County						
Yes	289	265	91.6	195	74.0	68.0
No	794	744	93.8	570	77.1	72.7
Government- Dependent Economy County						
Yes	121	113	93.4	88	79.3	74.5
No	962	896	93.2	677	75.9	71.1
County Racial/Ethnic Profile						
County with at least 90% non-Hispanic white population	138	128	93.0	103	79.7	75.0
County with plurality or majority Hispanic population	135	125	92.2	91	72.2	67.2
County with majority but fewer than 90% non-Hispanic white population	498	461	92.7	350	76.3	71.0
County with a racially/ethnically mixed population, no majority group	297	282	95.1	212	76.7	72.9
County with plurality or majority non-Hispanic black population	12	11	91.5	7	59.4	58.4
County with at least 20% American Indian population	3	2	62.0	2	100.0	62.0
Phase						
Phase 1	344	318	92.6	235	74.8	69.4
Phase 2	306	283	92.5	211	75.3	70.1
Phase 3	433	408	94.3	319	78.1	73.9

Source: NBS, Round 4.

d. Propensity Models for Weight Adjustments

The weight adjustments used in the Ticket Participant Sample were based on predicted propensities from a logistic regression model. As indicated earlier, we calculated the adjustments by taking the inverse of the predicted location and cooperation propensities, which were determined by using separate logistic models for each of the three provider-payment-type subpopulations.

The adjusted weight for each sample case is the product of the initial sampling weight and the adjustment factor, trimmed to ensure that the maximum location adjustment did not exceed 2 and that the maximum cooperation adjustment did not exceed 3.

Below, we provide the primary factors used to calculate the location adjustments, with the potential levels used in the models. (Appendix J details how the levels were collapsed for each model.)

1. **DIVISION.** Geographic region of beneficiary's place of residence, based on U.S. Census divisions, with nine levels: (1) Pacific, (2) Mountain, (3) East North Central, (4) West North Central, (5) East South Central, (6) West South Central, (7) South Atlantic, (8) Middle Atlantic, (9) New England

2. **METRO.** Urbanicity of beneficiary's place of residence; possible levels: (1) beneficiary lived in metropolitan area of 1 million or more residents, (2) beneficiary lived in metropolitan area of 250,000 to 1 million residents, (3) beneficiary lived in metropolitan area of fewer than 250,000 residents, (4) beneficiary lived in nonmetropolitan area adjacent to a metropolitan area of 1 million or more, (5) beneficiary lived in nonmetropolitan area adjacent to a metropolitan area of fewer than 1 million, (6) beneficiary lived in nonmetropolitan area not adjacent to any metropolitan area
3. **DIG.** Disability diagnostic classification; possible levels: (1) mental disability, (2) physical disability (excluding deaf cases), (3) deaf, (4) unknown
4. **LIVING.** Beneficiary's living situation; possible levels: (1) beneficiary lives alone, (2) beneficiary lives with his or her parents, (3) beneficiary lives in an institution, (4) information unknown
5. **AGECAT.** Beneficiary's age category; possible levels: (1) age 18 to 29, (2) age 30 to 39, (3) age 40 to 49, (4) age 50 to 64
6. **SSI_SSDI.** Beneficiary status; possible levels: (1) SSI only, (2) SSDI only, (3) both SSI and SSDI
7. **REPREPAYEE.** The identity of the payee with respect to the beneficiary; possible levels: (1) the beneficiary received payments himself or herself, (2) a family member received benefits on behalf of the beneficiary, (3) an institution received payments on behalf of the beneficiary or identity of payee not known
8. **RACE.** Possible levels: (1) white, (2) black, (3) Asian or Pacific Islander, (4) not white, black, or Asian/Pacific Islander or unknown
9. **CNTYRACE.** County racial ethnic profile; two levels: (1) county with racially/ethnically mixed population based on 2000 Census, no majority group, (2) other racial/ethnic profile in county
10. **CNTYSVC.** Service-dependent economy county; two levels: (1) county with 45 percent or more of average annual labor and proprietors' earnings derived from services (SIC categories of retail trade; finance, insurance, and real estate; and services) during 1998–2000, (2) county without this attribute
11. **MOVE.** Count of addresses in SSA files; four levels: (0) no information, (1) one address in file, (2) two addresses in file, (3) three or more addresses in file
12. **PHONE.** Count of phone numbers in SSA files; three levels: (0) no information, (1) one phone number in file, (2) two or more phone numbers in file

In Table VI.9, we list the variables used in each Ticket participant location model. Appendix J features an expanded form of Table VI.9 that presents the specific levels of the main effects for each model, along with parameter estimates and their standard errors.

Table VI.9. Variables Used in the Location Logistic Propensity Models: Ticket Participant Sample

Variables in Location Model for Participants Using SVRAs Acting as EN Provider
Main Effects
MOVE (COUNT OF ADDRESSES ON FILE)
PHONE (COUNT OF PHONE NUMBERS ON FILE)
LIVING (LIVING SITUATION)
METRO (METROPOLITAN STATUS OF COUNTY)
CNTYRACE (COUNTY RACIAL/ETHNIC PROFILE)
CNTYSVC (SERVICE-DEPENDENT ECONOMY COUNTY)
Variables in Location Model for Participants Using Non- SVRA ENs as EN Provider
Main Effects
DIVISION (CENSUS DIVISION)
DIG (DISABILITY)
LIVING (LIVING SITUATION)
MOVE (COUNT OF ADDRESSES IN FILE)
PHONE (COUNT OF PHONE NUMBERS IN FILE)
SSI_SSDI (RECIPIENT OF SSI, SSDI, OR BOTH)
CNTYRACE (COUNTY RACIAL/ETHNIC PROFILE)
CNTYSVC (SERVICE-DEPENDENT ECONOMY COUNTY)
Two-Factor Interaction
PHONE*CNTYRACE
DIG*MOVE
DIG*CNTYRACE
DIG*PHONE
Variables in Location Model for Participants Using Traditional Payment System
Main Effects
LIVING
SSI_SSDI
METRO
MOVE (COUNT OF ADDRESSES IN FILE)
PHONE (COUNT OF PHONE NUMBERS IN FILE)
REPREPAYEE (IDENTITY OF PAYEE WITH RESPECT TO BENEFICIARY)
AGECAT (AGE CATEGORY)
RACE
DIG (DISABILITY)

Below, we list the primary factors in the cooperation models, noting only the base variables with all possible levels. We provided some of the base variables in the discussion of location adjustments and do not repeat their earlier descriptions. (Appendix J describes how the levels were collapsed for each model.)

1. **MOVE.** Count of addresses in SSA files; four levels: (0) no information, (1) one address in file, (2) two addresses in file, (3) three or more addresses in file
2. **DIG.** Disability diagnostic classification; possible levels: (1) mental disability, (2) physical disability (excluding deaf cases), (3) deaf, (4) unknown
3. **REPREPAYEE.** The identity of the payee with respect to the beneficiary; possible levels: (1) the beneficiary received payments himself or herself, (2) a family member received benefits on behalf of the beneficiary, (3) an institution received payments on behalf of the beneficiary or identity of payee not known

4. **PDZIPSAME.** Whether the beneficiary and the applicant for benefits lived in the same ZIP code; two levels: (1) beneficiary and applicant lived in the same ZIP code, (2) beneficiary and applicant lived in different ZIP codes/information unknown
5. **METRO.** Urbanicity of beneficiary's place of residence; possible levels: (1) beneficiary lived in metropolitan area of 1 million or more residents, (2) beneficiary lived in metropolitan area of 250,000 to 1 million residents, (3) beneficiary lived in metropolitan area of fewer than 250,000 residents, (4) beneficiary lived in nonmetropolitan area adjacent to a metropolitan area of 1 million or more, (5) beneficiary lived in nonmetropolitan area adjacent to a metropolitan area of fewer than 1 million, (6) beneficiary lived in nonmetropolitan area not adjacent to any metropolitan area
6. **GENDER (SEX).** Two levels: (1) male, (2) female
7. **REGION or DIVISION.** Geographic region of beneficiary's place of residence: DIVISION is based on U.S. Census divisions, with nine levels: (1) Pacific, (2) Mountain, (3) East North Central, (4) West North Central, (5) East South Central, (6) West South Central, (7) South Atlantic, (8) Middle Atlantic, (9) New England; REGION is based on U.S. Census regions with four levels, which may be collapsed from the nine levels of DIVISION: (1) West is Pacific + Mountain, (2) Midwest is East North Central + West North Central, (3) South is East South Central + West South Central + South Atlantic, (4) Northeast is Middle Atlantic + New England[63]
8. **LIVING.** Beneficiary's living situation; possible levels: (1) beneficiary lives alone, (2) beneficiary lives with his or her parents, (3) beneficiary lives in an institution, (4) information unknown
9. **PHONE.** Count of phone numbers in SSA files; three levels: (0) no information, (1) one phone number in file, (2) two or more phone numbers in file
10. **AGECAT.** Beneficiary's age category; possible levels: (1) age 18 to 29, (2) age 30 to 39, (3) age 40 to 49, (4) age 50 to 64
11. **SSI_SSDI.** Beneficiary status; possible levels: (1) SSI only, (2) SSDI only, (3) both SSI and SSDI
12. **TOC.** Type of claim; possible levels: (1) survivor claim, (2) disability claim, (3) type of claim unknown
13. **RACE.** Possible levels: (1) white, (2) black, (3) Asian or Pacific Islander, (4) not white, black, or Asian/Pacific Islander or unknown
14. **HISPANICITY.** Whether the beneficiary was Hispanic or not; two levels: (1) Hispanic, (2) not Hispanic or unknown
15. **CNTYRACE.** County racial ethnic profile; two levels: (1) county with racially/ethnically mixed population based on 2000 Census, no majority group, (2) other racial/ethnic profile in count

[63] Many of the cooperation models used REGION instead of DIVISION. If a U.S. Census division was used in a model, then the U.S. Census region corresponding to that division could not be in the model.

16. **CNTYPOPLOSS.** County with population loss; two levels: (1) county with population loss in both 1980–1990 and 1990–2000 decennial periods, (2) county with population gain in 1980–1990 and/or 1990–2000 decennial periods
17. **CNTYLOWEDUC.** County with low education; two levels: (1) county where 25 percent or more of residents age 25 through 64 had neither a high school diploma nor Graduate Equivalency Degree (GED) in 2000, (2) county without this attribute
18. **CNTYHOUSSTRESS.** County with issues related to housing; two levels: (1) 30 percent or more of households had one or more of these housing conditions in 2000: lacked complete plumbing, lacked complete kitchen, paid 30 percent or more of income for owner costs or rent, or had more than one person per room, (2) county without this attribute
19. **CNTYGOV.** County with government-dependent economy: (1) 15 percent or more of average annual labor and proprietors' earnings derived from Federal and state government during 1998–2000, (2) county without this attribute
20. **CNTYSVC.** Service-dependent economy county; two levels: (1) county with 45 percent or more of average annual labor and proprietors' earnings derived from services (SIC categories of retail trade; finance, insurance, and real estate; and services) during 1998–2000, (2) county without this attribute
21. **CNTYNONSP.** Nonspecialized-dependent economy county; two levels: (1) county that did not meet economic thresholds for government-dependent economy, mining-dependent economy, manufacturing-dependent economy, farming-dependent economy, or service-dependent economy during 1998–2000, (2) county that meets one or more thresholds for the listed economic dependencies

The models for the cooperation of sample members included various interactions among the above variables. In Table VI.10, we list the variables included in each Ticket participant cooperation model. Appendix J features an expanded form of Table VI.10, with levels appropriately collapsed for each model and the specific levels of the interactions, along with parameter estimates and their standard errors.

Table VI.10. Variables in the Cooperation Logistic Propensity Models: Ticket Participant Sample

Variables in SVRA EN Cooperation Model
Main Effects
REPREPAYEE (IDENTITY OF PAYEE WITH RESPECT TO BENEFICIARY)
MOVE (COUNT OF ADDRESSES IN FILE)
PHONE (COUNT OF PHONE NUMBERS IN FILE)
SSI_SSDI (RECIPIENT OF SSI, SSDI, OR BOTH)
DIVISION (CENSUS DIVISION)
PHONE (COUNT OF PHONES IN FILE)
DIG (DISABILITY)
RACE
GENDER
AGECAT (AGE CATEGORY)
CNTYSVC (SERVICE
CNTYNONSP (NONSPECIALIZED
Two- Factor Interactions
AGECAT*CNTYNONSP
RACE*GENDER
DIG*AGECAT
GENDER*PHONE

Table VI.10 *(continued)*

Variables in Non- SVRA EN Cooperation Model
Main Effects
REPREPAYEE (IDENTITY OF PAYEE WITH RESPECT TO BENEFICIARY)
MOVE (COUNT OF ADDRESSES IN FILE)
PHONE (COUNT OF PHONE NUMBERS IN FILE)
GENDER
SSI_SSDI (RECIPIENT OF SSI, SSDI, OR BOTH)
REGION (CENSUS REGION)
PHONE (COUNT OF PHONES IN FILE)
DIG (DISABILITY)
PDZIPSAME (WHETHER APPLICANT AND BENEFICIARY LIVE IN SAME ZIP CODE)
CNTYRACE (COUNTY RACIAL/ETHNIC PROFILE)
CNTYSVC (SERVICE-DEPENDENT ECONOMY COUNTY)
CNTYGOV (GOVERNMENT-DEPENDENT ECONOMY COUNTY)
CNTYHOUSSTRES (COUNTY WITH ISSUES RELATED TO HOUSING)
CNTYNONSP (NONSPECIALIZED-DEPENDENT ECONOMY COUNTY)
METRO (METROPOLITAN STATUS OF COUNTY)
Two- Factor Interactions
PDZIPSAME*CNTYNONSP
PHONE*CNTYNONSP
FEMALE*PHONE
REGION*METRO
RACE*PHONE
CNTYRACE*CNTYSVC
RACE*CNTYHOUSSTRES
SSI_SSDI*PHONE
DIG*CNTYNONSP
Variables in Traditional Cooperation Model
Main Effects
MOVE (COUNT OF ADDRESSES IN FILE)
PHONE (COUNT OF PHONE NUMBERS IN FILE)
DIVISION (CENSUS DIVISION)
DIG (DISABILITY)
TOC (TYPE OF DISABILITY CLAIM)
RACE
CNTYRACE (COUNTY RACIAL/ETHNIC PROFILE)
CNTYPOPLOSS (POPULATION LOSS COUNTY)
CNTYLOWEDUC (COUNTY WITH LOW EDUCATION)
Two- Factor Interactions
TOC*BLACK

As with the beneficiary sample, the model-fitting process proved to be complex. After identifying a smaller pool of main effects and interactions for potential inclusion in the final model, we used backward and forward stepwise logistic regressions in the SAS LOGISTIC procedure to evaluate statistically and identify a set of models from which to select the final model. Given that the SAS logistic regression procedure does not incorporate the sampling design, we used the logistic regression procedure in SUDAAN to make the final selection of covariates.

For selecting variables or interactions in the stepwise procedures, we again included variables or interactions with a statistical significance level (alpha level) of 0.30 or lower (instead of the usual 0.05). Once we identified the candidate list of main effects and interactions, we used a thorough model-fitting process to determine a parsimonious model with few very small propensities.

In Table VI.9, we summarize the main effects used to calculate the location adjustments; in Table VI. 10, we summarize the main effects and interactions in the models for cooperation among

located sample members. In Table VI.11, we provide the R-squared values for the six logistic models.

Table VI.11. Unadjusted and Adjusted R-Squared Values for Logistic Propensity Models in Ticket Participant Cross-Sectional Samples

Model		Unadjusted R-Squared Value	Adjusted R-Squared Value
Payment System/ Provider-Payment Type	Location or Cooperation		
SVRA EN	Location	0.159	0.337
SVRA EN	Cooperation	0.084	0.128
Non-SVRA EN	Location	0.079	0.201
Non-SVRA EN	Cooperation	0.081	0.122
Traditional	Location	0.080	0.205
Traditional	Cooperation	0.076	0.114

The unadjusted R-squared value for the location models ranged from 0.079 to 0.159 (0.201 to 0.337 when rescaled to have a maximum of 1). The unadjusted R-squared value for the nonresponse models ranged from a low of 0.076 (0.114 when rescaled as above) to 0.084 (0.128 when rescaled). The values are similar to those observed for other response propensity modeling efforts that used logistic regression with design-based sampling weights. In Table VI.12, we present the percentages of concordant and discordant pairs and the p-values for the Hosmer-Lemeshow goodness-of-fit test.

Table VI.12. Percentages of Concordant and Discordant Pairs and Hosmer-Lemeshow p-Values for Logistic Propensity Models in Ticket Participant Cross-Sectional Samples

Model		Percentage Concordant	Percentage Discordant	Hosmer-Lemeshow p-Value
Payment System/ Provider-Payment Type	Location or Cooperation			
SVRA EN	Location	74.3	23.3	0.244
SVRA EN	Cooperation	65.5	34.0	0.848
Non-SVRA EN	Location	78.0	21.0	0.462
Non-SVRA EN	Cooperation	65.0	34.5	0.548
Traditional	Location	79.9	19.2	0.902
Traditional	Cooperation	67.1	30.9	0.364

The minimum difference between the percentages of concordant and discordant pairs is 30.5 percentage points (the non–SVRA cooperation model). In general, the proportions of concordant and discordant pairs indicate stronger models for the location models compared to the cooperation models. The minimum p-value associated with the Hosmer-Lemeshow goodness-of-fit test is 0.244, indicating no evidence of lack of fit for any of the models.

4. Trimming

As indicated earlier, we trimmed adjustment factors so that the location adjustment factors did not exceed 2 and the cooperation adjustment factors did not exceed 3. In Table VI.13, we provide the adjustment factors for all six logistic regression models before and after trimming as well as the number of adjustment factors trimmed.

Table VI.13. Count of Trimmed Adjustment Factors and Range of Adjustment Factors Before and After Trimming

Model				
Payment System/ Provider-Payment Type	Location or Cooperation	Count of Number Trimmed	Range Before Trimming	Range After Trimming
SVRA EN	Location	1	1.00–2.02	1.00–2.00
SVRA EN	Cooperation	0	1.03–2.59	1.03–2.59
Non–SVRA EN	Location	10	1.00–2.49	1.00–2.00
Non–SVRA EN	Cooperation	2	1.04–3.50	1.04–3.00
Traditional	Location	0	1.00–1.97	1.00–1.97
Traditional	Cooperation	2	1.01–3.43	1.01–3.00

After we applied the trimmed adjustments to the sampling weights, we reviewed the distribution of weights to determine the need for trimming such weights. In view of the wide variation in the magnitude of the weights, which was attributable to the use of composite weights in the SVRA and non–SVRA provider-payment types, trimming was sometimes warranted in order to increase the survey estimates' precision. However, to reduce the potential for bias in the estimates, we minimized the extent of trimming. In Table VI.14, we present the design effects attributable to unequal weighting associated with each of the six-phase/payment-type combinations before and after trimming, before post-stratification. We calculated design effects separately within trimming strata, which, in turn, we defined within the three strata based on payment system and provider type. In general, we defined the trimming strata according to whether the observation was in the clustered or unclustered sample. For unclustered cases, we further subdivided the trimming strata according to whether the sample case was/was not in a PSU. Table VI.14 indicates the strata within which trimming was employed. In the absence of trimming for a payment system and provider type, the table describes the maximum design effect across all trimming strata. In such an instance, the table does not present the stratum associated with that maximum design effect; in most cases, when no trimming is required, the design effects do not differ significantly across trimming strata.

Table VI.14. Design Effects Attributable to Unequal Weights Before and After Trimming, Within Trimming Strata, for Payment Types in the Round 4 Ticket Participant Samples

Payment Type	Trimming Stratum in Which Trimming Occurred	Design Effect Attributable to Unequal Weights	
		Before Trimming	After Trimming
SVRA EN	No trimming (three trimming strata)	2.62 (maximum)	2.62 (maximum)
Non-SVRA EN	Clustered	1.63	1.60
Traditional	No trimming (three trimming strata)	1.08 (maximum)	1.08 (maximum)

Design effect attributable to unequal weights = $n\Sigma w^2 / \left(\Sigma w\right)^2$

5. Post-Stratification

After the nonresponse adjustment and trimming, we post-stratified the weights to the population age and gender totals for each payment type obtained from the SSA sampling frame. The sampling frame included all SSI or SSDI beneficiaries for each provider-payment type within the population of Ticket Participants. We rechecked the distributions of weights within each provider-payment type to determine the need for more weight trimming. We found no extreme weights after post-stratification.

VII. IMPUTATIONS

The NBS data collection instruments were administered with computer-assisted interviewing (CAI) technology. The technology allows the use of automated routing to move the respondent to the applicable questions and performs checks of the entered data for consistency and reasonableness. In addition, it does not permit a question to be left blank; therefore, the interviewer may not proceed until an appropriate response has been entered ("don't know" and "refused" are included as response options and used as necessary). These processes substantially reduce the extent of item nonresponse for a complex survey, although some item nonresponse will persist as when a question was mistakenly not asked and when "don't know" or "refused" were recorded as responses.

For the NBS, we used primarily two methods of imputation to compensate for item nonresponse: deductive (or logical) imputation and unweighted hot-deck imputation. However, for some variables, the data were insufficient for use of either method and thus required the use of specialized imputation procedures were employed to use with the available data. Selection of the methods was based on the type of variable (dichotomous, categorical, or continuous), the amount of missing data, and the availability of data for the imputations. For some variables, imputations were processed using a combination of methods.

Deductive, or logical, imputation is based on a review of the data related to the imputed variable. It assigns a value that may be deduced from other data or for which there is a high degree of certainty that the value is correct.

The hot-deck imputation procedure involves the classification of sample members into mutually exclusive and exhaustive imputation classes (or imputation cells) of respondents who are assumed to be similar relative to the key population variables (such as age, disability status, and SSI recipient status). For each sample member with a missing value (a recipient), a sample member with complete data (a donor) is chosen within the same imputation class to provide a value. Ideally, the imputation class should contain sufficient sample members to avoid the selection of a single donor for several sample members with missing data.

The hot-deck procedure is computationally efficient, and, in a National Center for Education Statistics working paper (USDE 2001), a simulation study showed that a hot-deck procedure fared well in comparison to more sophisticated imputation procedures, including multiple imputation, Bayesian bootstrap imputation, and ratio imputation. The USDE study evaluated imputation methods in terms of bias of the mean, median, quartile, and variance estimates, coverage probability, confidence interval width, and average imputation error.

Although the variance of estimates was a key item used to evaluate methods by the USDE study, we made no attempt in this study to estimate the component of variance attributable to imputation, even though such a component is always positive. Users should be aware that variance estimates that use imputed data will be underestimates, with the amount of bias in the variance estimate directly related to the amount of missingness in the variable of interest. For most of the variables requiring imputation, the extent of missingness was low; thus, the component of variance would be very small in most cases.

For the NBS, the hot-deck imputation procedure used an unweighted selection process to select a donor, with selections made within imputation classes defined by key related variables for each

application. In addition to the variables defining the imputation classes, we included a sorting variable that sorted the recipient and all donors within the imputation class together by levels of the variable. Using the sorted data within the imputation class, we randomly selected as the donor with equal probability a case immediately preceding or following a sample member with missing data. Therefore, the hot-deck procedure was unweighted and sequential, with a random component. We allowed with-replacement selection of a donor for each recipient. In other words, a sample member could have been a donor for more than one recipient. Given that the extent of missing values was very low for most variables, we used only a few donors more than once.[64]

Where appropriate, we made imputed values consistent with pre-existing nonmissing variables by excluding donors with potentially inconsistent imputed values. After processing each imputation, we used a variety of quality control procedures to evaluate the imputed values. If the initial imputed value was beyond an acceptable range or inconsistent with other data for that case, we repeated the imputation until the imputed value was in range and consistent with other reported data.

The factors used to form the cells for each imputed variable needed to be appropriate for the population, the data collected, and the purpose of the NBS. In addition, the imputation classes needed to possess a sufficient count of donors for each sample member with missing data. We used a variety of methods to form the imputation classes: bivariate cross-tabulations, step-wise regressions, and multivariate procedures such as CHAID.[65] To develop the imputation classes, we used information from both the interview and SSA data files. The classing and sorting variables were closely related to the variable to be imputed (the response variable). The sorting variables either were less closely related to the response variable than were the classing variables or were forms of the classing variables with finer levels. As an example of the latter situation, we sometimes used four age categories as imputation classes: (1) 18 to 29, (2) 30 to 39, (3) 40 to 49, and (4) 50 to 64. We could then use the actual age as a sorting variable to ensure that donors and recipients were as close together in age as possible.

In the case of missing values in the variables used to define imputation classes, we applied two strategies: (1) matching recipients to donors also missing the value for the covariate or (2) employing separate hot decks, depending on the availability of the variables defining the imputation classes. In the first instance, we treated the level defined as the missing value as a separate level. In other words, if a recipient was missing a value for a variable defining an imputation class, the donor also was missing the value for that variable. We used the first strategy if a large number of donors and recipients were missing the covariate in question. In the second instance, we used a variable for a given recipient to define the imputation class for that recipient only if there was no missing value for that variable. The variables used to define an imputation class for each recipient depended on what values were nonmissing among those variables.

The hot-deck software automatically identified situations in which the imputation class contained only recipients and no donors. In such cases, we collapsed imputation classes and once

[64] Household income, used to determine the federal poverty threshold indicator, was the exception. Approximately 15 percent gave no household income information at all, and an additional (approximately) 17 percent gave only general categories of income. Detailed levels of missingness are given for all imputed variables later in this chapter.

[65] Chi-Squared Automatic Interaction Detection software is attributed to Kass [1980] and Biggs et al. [1991], and its application in SPSS is described in Magidson [1993].

again performed the imputation with the collapsed classes. The strategy for collapsing classes required a ranking of the variables used to define the imputation class with regard to each variable's relationship to the variable requiring imputation. If several covariates aided in imputing a given variable, the covariates less closely related to the variable requiring imputation were more likely than the important covariates in the imputation to have levels that we had to collapse. In addition, variables with a large number of levels also were more likely to have levels that we had to collapse. In general, if more than a very small number of imputation classes required collapsing, we dropped one or more variables from the definition of the imputation class and re-ran the imputation procedure.

Some variables were constructed from two or more variables. For some of the constructed variables, it was more efficient to impute the component variables and then impose the recoding of the constructed variable on these imputed values, rather than imputing the constructed variable directly. In the tables that follow in this chapter, we do not show the component variables because they were not included in the final data set.

For some imputed variables in the data set, the number of missing responses does not match the number of imputed responses. Often, the variables correspond to questions that follow a filter question. For example, Item I33 asks if the respondent has difficulty climbing 10 steps; if the response is "yes," the follow-up question (Item I34) asks if the respondent is able to climb 10 steps at all. To be asked the follow-up question, the respondent must have answered "yes" to the screener question. If the respondent answered "no," the follow-up question was coded a legitimate missing (.l), which was not imputed. However, if the respondent refused to answer the screener question, the follow-up question was also coded a legitimate missing. If the screener variable was then imputed to be "yes," the response to the follow-up question was imputed, causing the count of the actual number of imputed responses to be greater than the number of missing or invalid responses.

A. NBS Imputations of Specific Variables

In the following several tables, we present information on how the NBS applied imputation, including the imputed variable names and a brief description of each variable as well as the methods of imputation, total number of missing responses, number of respondents eligible for the question, and percentage of imputed responses. We recorded this information in the final file with an imputation flag, identified by the suffix "iflag," which has the following nine levels: (.) legitimate missing or no answer, (0) self-reported data, (1) logical imputation, (2) administrative data, (3) hot-deck imputed, (4) imputation using the distribution of a variable related to the variable being imputed, (5) imputation based on specialized procedures specific to Section K, (6) constructed from other variables with imputed values, and (7) longitudinal imputation (using data from an earlier round).[66] In most cases, the logical assignments relied on imputed values. Therefore, the distinction between "logically assigned" and "constructed from other variables with imputed values" is somewhat opaque. In general, if we made a logical assignment for variables corresponding directly to questionnaire questions, we set the flag to 1. For variables constructed from these variables (constructed variables are prefixed with a "C_"), we set the flag to 6. In this instance, we imputed

[66] In prior rounds, the survey had a longitudinal component which Round 4 did not have. Therefore, a longitudinal imputation was considerably more common in prior rounds than in Round 4.

one or more of the component variables in the constructed variable. All variables that include imputed values are identified with the suffix "_i."

In the sections that follow, we summarize the imputations that we conducted, organized by the sections within the questionnaire to which the variables correspond, and provide details for some of the imputation types for each section.

1. Section L: Race and Ethnicity

Several questions gathered information on respondents' race and ethnicity. Two of the variables in Section L included imputed responses, as described in Table VII.1. In particular, L1_i corresponds to the question asking whether the respondent is Hispanic or not; C_Race_i corresponds to the question asking about the respondent's race.

Table VII.1. Race and Ethnicity Imputations

Variable Name	Description	Imputation Method	Number Missing	Number Eligible	Percent Imputed
L1_i	Hispanic/Latino ethnic origins	2 imputations from SSA's administrative data, 3 logical imputations, 108 imputations from hot deck	113	5,078	2.23
C_Race_i	Race	46 imputations from SSA's administrative data, 222 imputations from hot deck	268	5,078	5.28

Source: NBS, Round 4.

In the above table, respondents who did not indicate in the questionnaire whether they were Hispanic were classified as such if the SSA administrative data so indicated; we conducted the single logical imputation by looking at the name of the respondent and comparing it to a list of Hispanic names provided by the North American Association of Central Cancer Registries (NAACCR 2003). For respondents who still had missing data, we imputed the Hispanic indicator by using a hot deck with imputation classes defined by the ZIP code of each sample member, with race as a sorting variable. Not surprisingly, the imputation classes based on ZIP code commonly required collapsing to ensure that an imputation class had a sufficient number of donors for the recipients in that class. An automated process in SAS performed the needed check. However, to ensure that the ZIP code imputation classes being collapsed were as similar as possible, we manipulated the software so that the county of the donor ZIP code and county of the recipient ZIP code had a similar racial and ethnic composition according to data from the Area Resource File, a file with demographic, health, and economic-related data for every county in the United States (Area Resource File 2009–2010).

Respondents could choose from five race categories—white, black/African American, Asian, Hawaiian/Pacific Islander, and Native American/American Indian—and could select more than one of the categories to identify themselves (as prescribed by the Office of Management and Budget). The final race variable on which imputation was applied included six categories, with a separate category for respondents reporting multiple races. Although the SSA administrative data did not have a category for multiple races, respondents with race information in the SSA files were categorized according to four of the five categories above (Hawaiian/Pacific Islanders were included with respondents reporting Asian). Respondents who did not answer the race question but did have race information in the SSA files were categorized into one of the four categories, resulting in the misclassification of respondents—with SSA administrative data—who did not answer the race

question in the survey but would have identified themselves as multiple race or Hawaiian/Pacific Islander. However, we assumed that the number of such respondents was small and that their misclassification was not a major problem. As with the Hispanic indicator, for respondents still with missing data, we imputed race by using a hot deck with imputation classes defined by the ZIP code of each sample member, with Hispanicity as a sorting variable. In general, if the respondent was a longitudinal case then we used the imputed value from earlier rounds. However, the absence of a longitudinal component made longitudinal imputations very rare in Round 4. We did not impute any cases for the race and ethnicity variables using data from earlier rounds.

2. Section B: Disability Status Variables and Work Indicator

In Table VII.2, we describe five imputed variables that pertain to the sample member's disability status and an indicator of whether the respondent was currently working. The imputed variables include three that collapse and recode primary diagnosis codes from the ICD-9 in three ways: C_MainConBodyGroup_i, which corresponds to the collapsing in Table II.2; C_MainConDiagGrp_i; and C_MainConColDiagGrp_i. Additional disability status variables include age when the disability was first diagnosed (C_DisAge_i) and an indicator of childhood or adult onset of the disability (C_AdultChildOnset_i). We also imputed a fourth variable with collapsed primary diagnosis codes, with levels further collapsed from C_MainConDiagGrp_i. Table VII.2 does not include this variable (C_MainConImput_i) because it was not released to the final file but was used in subsequent imputations as a classing variable. As with race and ethnicity, the age when the disability was first diagnosed cannot change from one round to the next. Despite the absence of a longitudinal component in Round 4, a few cases selected for Round 4 were part of the sample for one or more of the earlier rounds. For two missing values among these cases, we obtained the age variable from earlier rounds, one from Round 1 and one from Round 3. All missing values for C_AdultChildOnset_i were "logically assigned" by using the imputed values from C_DisAge_i, the age-of-onset variable. In addition, Section B contains a question asking whether the respondent was currently working (Item B24_i) in what is a gate question for all of Section C's work status variables.

Table VII.2. Disability Status Imputations

Variable Name	Description	Imputation Method	Number Missing	Number Eligible	Percent Imputed
C_MainConDiagGrp_i	Primary diagnosis group	84 hot deck	84	4,540	1.85
C_MainConColDiagGrp_i	Main condition diagnosis group collapsed	84 constructed from imputed variables	84	4,540	1.85
C_MainConBodyGroup_i	Main condition body group	8 hot deck, 76 constructed from imputed variables	84	4,540	1.85
C_Disage_i	Age at onset of disability	175 hot deck, 2 from longitudinal data	177	5,078	3.49
C_Adultchild_onset_i	Adult/child onset of disability	21 constructed from imputed variables	21	5,078	0.41
B24_i	Currently working	4 hot deck	4	5,078	0.08

Source: NBS, Round 4.

To define imputation classes, all of the variables in Section B used an indicator to specify whether the onset of the disability occurred in childhood or adulthood and to specify age and gender. We also used one of the collapsed condition code variables, C_MainConImput_i, as a classing variable for disability age and the work indicator. We used additional classing variables specific to the variable being imputed.

3. Section C: Current Jobs Variables

Several survey questions asked respondents about current employment. Section C asked such questions only of respondents who indicated in Item B24 that they were currently working; as identified in Table VII.3, the questions asked about salary (C_MainCurJobHrPay_i, C_MainCurJobMnthPay_i, and C_TotCurJobMnthPay_i); usual hours worked at the job or jobs (C8_1_i, C_TotCurWkHrs_i, and C_TotCurHrMnth_i); the number of places the respondent was employed (C1_i); and job description of the place of main employment (C2_1_1d_i).

Table VII.3. Current Jobs Imputations

Variable Name	Description	Imputation Method	Number Missing	Number Eligible	Percent Imputed
C1_i	Count of current jobs	1 hot deck	1	1,023	0.10
C2_1_1d_i	Main current job SOC code to one digit	4 hot deck[a]	4	1,023	0.39
C8_1_i	Hours per week usually worked at current main job	31 hot deck,[b] 2 imputed by distributional assumptions	33	1,023	3.23
C_TotCurWkHrs_i	Total weekly hours at all current jobs	31 hot deck,[c] 4 constructed from imputed variables	35	1,023	3.42
C_TotCurHrMnth_i	Total hours per month at all current jobs	35 constructed from imputed variables	35	1,023	3.42
C_MainCurJobHrPay_i	Hourly pay at current main job	4 logical, 112 constructed from imputed variables	116	1,023	11.34
C_MainCurJobMnthPay_i	Monthly pay at current main job	21 logical, 10 imputed by distributional assumptions, 102 constructed from imputed variables	133	1,023	13.00
C_TotCurMnthPay_i	Total monthly salary all current jobs	29 logical, 102 hot deck, 6 constructed from imputed variables	137	1,023	13.39

Source: NBS, Round 4.

[a] Imputations for current job variables excluded four cases coded as "don't know" or "refused" in Item B24, which were imputed as currently not working in Item B24_i.

[b] Imputations for current job variables excluded four cases coded as "don't know" or "refused" in Item B24, which were imputed as currently not working in Item B24_i.

[c] If C8_1_i was imputed by hot deck and the respondent had only one job, the flag indicated that C_TotCurWkHrs_i was imputed by hot deck, even though the variable was not processed in the hot-deck program.

Some of the variables in the above table had missing values that were not directly imputed. Rather, constituent variables not included in the table had missing values that were imputed and then combined to form the variables in the table. For example, we constructed C_TotCurWkHrs_i from the number of hours per week usually worked at the current main job plus the number of hours for each of the respondent's other jobs. In most cases, the respondent worked one job, so we set C_TotCurWkHrs_i equal to C8_1_i. However, if the respondent worked more than one job and the number of hours in secondary jobs was imputed, we constructed C_TotCurWkHrs_i from imputed variables.

We imputed values for other variables by using the distribution of a variable related to the variable at hand. For example, if the take-home monthly pay of the respondent's current main job was not missing but the gross monthly pay (C_MainCurJobMnthPay_i) for the job was missing, we used the relationship between gross monthly and take-home monthly pay among respondents missing neither variable to determine the appropriate value for gross monthly pay. In particular, a random draw was selected from the observed distribution of relative taxes, where "relative tax" is defined as the proportion of a respondent's pay devoted to tax. We then used the randomly drawn relative tax to determine an imputed gross monthly pay for 11 cases with missing data for C_MainCurJobMnthPay. As noted in Table VII.3, we applied hot-deck imputations to only four of the jobs variables: C1_i, C2_1_1d_i, C8_1_i, and C_TotCurMnthPay_i. For these variables, we used the level of education as a classing variable as well as additional classing and sorting variables specific to each variable, including a condition code variable for all but C_TotCurMnthPay_i.

4. Section I: Health Status Variables

Section I of the NBS accounts for 56 health status variables where imputations were applied. Tables VII.4 and VII.5 identify the 56 imputed variables and the methods of imputation used for each variable. The items cover a range of topics, from the respondent's general health to specific questions on instrumental activities of daily living (IADLs) and activities of daily living (ADLs) and other health and coping indicators. Included, too, in Section I is a series of questions pertaining to the respondent's use of illicit drugs and alcohol.

Table VII.4. Health Status Imputations, Questionnaire Variables

Variable Name	Description	Imputation Method(s)	Number Missing	Number Eligible	Percent Imputed
I1_i	Health during the past four weeks	10 hot deck	10	5,078	0.20
I9_i	Current health	30 hot deck	30	5,078	0.59
I17a_i	Wears glasses	19 hot deck	19	5,078	0.37
I17b_i	Difficulty seeing with glasses	9 logical, 33 hot deck	42	3,422	1.23
I18_i	Difficulty seeing no glasses	42 logical, 19 hot deck	59	1,698	3.47
I19_i	Uses special equipment because of difficulty seeing	38 logical, 11 hot deck	49	2,113	2.32
I21_i	Difficulty hearing	1 logical, 34 hot deck	35	5,078	0.69

Table VII.4 *(continued)*

Variable Name	Description	Imputation Method(s)	Number Missing	Number Eligible	Percent Imputed
I22_i	Able to hear normal conversation	29 logical, 8 hot deck	37	953	3.88
I23_i	Uses special equipment because of difficulty hearing	29 logical, 3 hot deck	32	953	3.36
I25_i	Difficulty having speech understood	4 logical, 31 hot deck	35	5,078	0.69
I26_i	Able to have speech understood at all	27 logical, 15 hot deck	42	1,339	3.14
I27_i	Uses special equipment because of difficulty speaking	27 logical, 5 hot deck	32	1,339	2.39
I29_i	Difficulty walking without assistance	14 logical, 36 hot deck	50	5,078	0.98
I30_i	Able to walk ¼ mile	21 logical, 56 hot deck	77	2,170	3.55
I31_i	Uses special equipment because of difficulty walking	21 logical, 13 hot deck	34	2,170	1.57
I33_i	Difficulty climbing 10 steps	1 logical, 51 hot deck	52	5,078	1.02
I34_i	Able to climb 10 steps at all	33 logical, 25 hot deck	58	2,210	2.62
I35_i	Difficulty lifting and carrying 10 pounds	4 logical, 35 hot deck	39	5,078	0.77
I36_i	Able to lift or carry 10 pounds at all	23 logical, 27 hot deck	50	2,053	2.44
I37_i	Difficulty using hands or fingers	1 logical, 33 hot deck	34	5,078	0.67
I38_i	Able to use hands or fingers at all	26 logical, 16 hot deck	42	1,157	3.63
I39_i	Difficulty reaching over head	2 logical, 39 hot deck	41	5,078	0.81
I40_i	Able to reach over head at all	22 logical, 20 hot deck	42	1,218	3.45
I41_i	Difficulty standing	52 hot deck	52	5,078	1.02
I42_i	Able to stand at all	25 logical, 13 hot deck	38	2,812	1.35
I43_i	Difficulty stooping	1 logical, 38 hot deck	39	5,078	0.77
I44_i	Able to stoop at all	18 logical, 43 hot deck	61	2,794	2.18

Table VII.4 *(continued)*

Variable Name	Description	Imputation Method(s)	Number Missing	Number Eligible	Percent Imputed
I45_i	Difficulty getting around inside home	1 logical, 26 hot deck	27	5,078	0.53
I46_i	Needs help to get around inside home	24 logical, 5 hot deck	29	769	3.77
I47_i	Difficulty getting around inside home	6 logical, 40 hot deck	46	5,078	0.91
I48_i	Needs help to get around outside home	24 logical, 21 hot deck	45	1,809	2.49
I49_i	Difficulty getting into/out of bed	2 logical, 39 hot deck	41	5,078	0.81
I50_i	Needs help getting into/out of bed	30 logical, 17 hot deck	47	1,309	3.59
I51_i	Difficulty bathing or dressing	4 logical, 32 hot deck	36	5,078	0.71
I52_i	Needs help bathing or dressing	27 logical, 10 hot deck	37	1,031	3.59
I53_i	Difficulty shopping	18 logical, 29 hot deck	47	5,078	0.93
I54_i	Needs help shopping	20 logical, 10 hot deck	30	1,463	2.05
I55_i	Difficulty preparing own meals	7 logical, 28 hot deck	35	5,078	0.69
I56_i	Needs help to prepare meals	22 logical, 12 hot deck	34	1,530	2.22
I57_i	Difficulty eating	25 hot deck	25	5,078	0.49
I58_i	Needs help to eat	23 logical, 4 hot deck	27	638	4.23
I59_i	Trouble concentrating	58 hot deck	58	5,078	1.14
I60_i	Trouble coping with stress	63 hot deck	63	5,078	1.24
I61_i	Trouble getting along with people	73 hot deck	73	5,078	1.44
CageScore_indicator_i	CAGE Alcohol Score	31 constructed from imputed variables	31	4,960	0.63
I72_i	Uses drugs in larger amounts than prescribed	46 hot deck	46	5,078	0.91

Source: NBS, Round 4.

Table VII.5. Health Status Imputations, Constructed Variables

Variable Name	Description	Imputation Method	Number Missing	Number Eligible	Percent Imputed
C_EquipFuncLim_I	Uses equipment/device for functional/sensory limitation	23 constructed from imputed variables	23	5,078	0.45
C_NumSenLim_i	Number of sensory limitations	85 constructed from imputed variables	85	5,078	1.67
C_NumSevSenLim_i	Number of severe sensory limitations	41 constructed from imputed variables	41	5,078	0.80
C_NumPhyLim_i	Number of physical functional limitations	144 constructed from imputed variables	144	5,078	2.84
C_NumSevPhyLim_i	Number of severe physical functional limitations	168 constructed from imputed variables	168	5,078	3.31
C_NumEmotLim_i	Number of emotional/social limitations	125 constructed from imputed variables	125	5,078	2.46
C_NumADLs_i	Number of impaired ADL	56 constructed from imputed variables	56	5,078	1.10
C_NumADLAssist_i	Number of ADL requiring assistance	54 constructed from imputed variables	54	5,078	1.06
C_NumIADLs_i	Number of IADL difficulties	68 constructed from imputed variables	68	5,078	1.34
C_NumIADLAssist_i	Number of IADL requiring assistance	37 constructed from imputed variables	37	5,078	0.73
C_PCS8TOT_i	Physical summary score	148 constructed from imputed variables	148	5,078	2.91
C_MCS8TOT_i	Mental summary score	148 constructed from imputed variables	148	5,078	2.91
C_DrugDep_i	Drug dependence	47 constructed from imputed variables	47	5,078	0.93

Source: NBS, Round 4.

The following is an example of a logical assignment in Section I: if a respondent did not answer whether he or she experienced difficulty in seeing newsprint letters even when wearing glasses or contact lenses (Item I17b) but indicated that he or she could not see newsprint letters at all (Item I18) or required special devices to read newsprint letters (Item I19), then we logically assigned "yes" to Item I17b_i.

As in previous sections, "constructed from imputed variables" refers to the fact that we imputed the constituent variables of each constructed variable.

The only classing variable common to all imputations was the collapsed condition code variable. We also used age and gender in most imputations. The other classing and sorting variables were specific to the variable being imputed.

5. Section K: Sources of Income Other than Employment

The imputed variables in Section K are constructed variables that pertain to nonemployment-based income and include workers' compensation, private disability claims, unemployment, and other sources of regular income, as described in Table VII.6.

Table VII.6. Imputations on Sources of Income Other than Employment

Variable Name	Description	Imputation Methods	Number Missing	Number Eligible	Percent Imputed
C_AmtPrivDis_i	Amount received from private disability last month	90 logical, 16 imputed by descriptive statistics using specialized procedures	107	5,078	2.11
C_AmtWorkComp_i	Amount received from workers' compensation last month	51 logical, 8 imputed by descriptive statistics using specialized procedures	59	5,078	1.16
C_AmtVetBen_i	Amount received from veterans' benefits last month	45 logical, 9 imputed by descriptive statistics using specialized procedures	54	5,078	1.06
C_AmtPubAssis_i	Amount received from public assistance last month	65 logical, 25 imputed by descriptive statistics using specialized procedures	90	5,078	1.77
C_AmtUnemply_i	Amount received from unemployment benefits last month	48 logical, 2 imputed by descriptive statistics using specialized procedures	50	5,078	0.98
C_AmtPrivPen_i	Amount received from private pension last month	50 logical, 17 imputed by descriptive statistics using specialized procedures	67	5,078	1.32
C_AmtOthReg_i	Amount received from other regular sources last month	44 logical, 20 imputed by descriptive statistics using specialized procedures	64	5,078	1.26

Source: NBS, Round 4.

Items in Section K first asked respondents if they received money from a specific source and then asked for the specific amount received from that source. If a respondent could not provide a specific value, he or she either answered a series of questions about whether the amount was above or below specific values or had the option of providing a range of values, where the options depended on responses to a series of questions. After we classified the response according to a range of values provided by the respondent, we assigned the respondent the median of the specific values provided by others who gave responses within the same range. If a respondent could not say

whether the actual value was above or below a specific threshold, we first imputed the range (using random assignment) and then assigned the median of the values provided by respondents who listed specific values within that range. If the respondent did not know if he or she received funds from a source, we used hot-deck imputation to determine whether such was the case and then proceeded as above.

The logical assignments in Section K derive from imputed values in the constituent questions. For example, K6 in the questionnaire asks whether the respondent received income from a variety of sources, and K7 asks the amount from each source for which a "yes" response was given. The first source listed (K6a) is private disability insurance. If the respondent was imputed not to have received private disability insurance (K6a_i), then the constructed variable C_AmtPrivDis_i (based on K7) was logically assigned "no." Otherwise, if any income was derived from private disability insurance, but an imputation was required at some point in the sequence (either everything or just the individual's income was imputed), then the imputation flag indicated imputation by "special procedures."

For variables requiring hot-deck imputation, the classing variables were the same for all variables: an indicator of whether the respondent was a recipient of SSI, SSDI, or both; living situation; and education. Table VII.6 lists none of the variables requiring hot-deck imputation because they were just component variables for the delivered variables listed in the table.

6. Section L: Personal and Household Characteristics

Other than the personal characteristics of race and ethnicity discussed earlier, most of the imputed variables in Section L pertain to household characteristics. The questions from which the imputed variables were derived ask about education (L3_i), marital status (L8_i), cohabitation status (C_Cohab_i), number of children in household (C_NumChildHH_i), household size (C_Hhsize_i), and weight and height, which were used to derive body mass index (C_BMI_cat_i). Most of these variables were imputed early in imputation processing and were used in the imputation of variables imputed later in processing.[67] Household income questions are also asked in Section L, which, in combination with C_Hhsize_i and C_Numchildhh_i, we use to derive the Federal poverty level variable.

The imputation of poverty level required the imputation of annual income and household size. The annual income question was another case that required a specific value; if the respondent could not provide a specific value, he or she was asked if annual income fell within certain ranges. Some respondents provided a specific value, some provided a range of values, and some refused to provide any information. Although annual income was a key variable used in the imputation of poverty level, it is not included in Table VII.7 because it was not released in the final file. All missing values in C_FedPovertyLevel_cat[68] were derived from the imputed annual incomes; hence, all

[67] An additional variable C_NumChildren_i was also imputed. It is defined as the total number of children in the household plus the number of respondent's children living outside the household. None of the subsequent processing used this variable, which, on further review, was not deemed necessary for analysis, although it is in the final file.

[68] The name of this variable reflects that fact that the final variable was a categorical (as opposed to a continuous) measure of poverty level.

missing values are "constructed from imputed variables." In Table VII.7, we identify the imputed variables in Section L.

Table VII.7. Imputations of Personal and Household Characteristics

Variable Name	Description	Imputation Method(s)	Number Missing	Number Eligible	Percent Imputed
C_BMI_Cat_i	Body Mass Index categories	185 hot deck	185	5,078	3.64
L3_i	Highest year/grade completed in school	99 hot deck	99	5,078	1.95
L8_i	Marital status	53 hot deck	53	5,078	1.04
L11_i	Living arrangements	3 logical, 48 hot deck	51	5,078	1.00
C_NumChildhh_i	Number of children living in household	3 logical, 32 hot deck, 1 constructed from imputed variables	36	5,078	0.71
C_hhsize_i	Household size	57 hot deck, 14 constructed from imputed variables	71	5,078	1.40
C_cohab_i	Cohabitation status	5 logical, 47 hot deck	52	5,078	1.02
C_FedPovertyLevel_cat1	2009 Federal poverty level	1,707 constructed from imputed variables	1,707	5,078	33.62

Source: NBS, Round 4.

Logical assignments in Section L are based on related variables also in Section L. For example, the two logical assignments for L11_i (living situation of beneficiary) are attributable to the fact that two respondents did not answer L11 but indicated in L16 (number of adults in household) that only one adult lived in the household and indicated in L17 (number in household under 18 years old) the number of children living in the household. For these two respondents, the value for L11_i was logically assigned to 1 or 2, depending on the response to L17.

The only classing variable common to all imputations for the variables listed in Table VII.7 was the collapsed condition code variable. Other classing and sorting variables were specific to the variable being imputed.

This page has been left blank for double-sided copying.

VIII. USING THE NBS RESTRICTED AND PUBLIC USE FILES

A. File Content and Technical Specifications

The NBS Round 4 Restricted Use File contain 5,078 records and 4,302 variables. The Public Use File contains 2,298 records and 575 variables. Variables are positioned on the file in the following order:

Survey administration variables. These variables are related to survey administration, including respondent type identifiers and other variables associated with conduct of the survey.

Sampling variables and weights. These variables include administrative variables used for sampling purposes and administrative data that provide additional descriptive information about the sample.

Variables from Sections A through M of the NBS questionnaire. These variables are ordered within each section by related questionnaire item number. Constructed variables created from source variables within a section are ordered at the end of each section.

SSA administrative data. These variables include a select set of data from SSA administrative records to enhance analyses of Ticket to Work participants.

Both the Restricted Use File and Public Use File are available in a SAS "sas7bdat" format database. The Restricted Use File has the following technical specifications:

- Data set name: R4NBSRAF
- Number of observations: 5,078
- Number of variables: 4,302
- Date last created: October 13, 2011

The Public Use File has the following technical specifications:

- Data set name: R4NBSPUF
- Number of observations: 2,298
- Number of variables: 575
- Date last created: October 13, 2011

B. Choosing a Sample and Weight Variable

As discussed in Chapter II, the NBS comprises two independent samples: (1) the National Representative Beneficiary Sample and (2) the Ticket Participant Sample. Use of the appropriate weight variables allows estimates of either the national beneficiary population or the TTW participant population. The weights specified below should be used when performing any analysis. Due to the design of the NBS and the variation of weights within sampling strata, the use of unweighted rather than weighted data in the analysis will provide incorrect results.

We computed separate weights for each sample to account for the sampling method, data collection method, and the survey's target populations: one for the Representative Beneficiary Sample (R4_WTR4_BEN), one for the Ticket Participant Sample (R4_WTR4_PAR), and one for the combined Representative Beneficiary and Ticket Participant Sample (R4_WTR4_COM). In Table VIII.1, we summarize the appropriate weights for each population of interest.

Table VIII.1. NBS Sample Weights

Weight Name	Description	Condition
R4_WTR4_BEN	Beneficiary weight	Orgsampinfo_Tstatus = 2 (Representative Beneficiary Sample)
R4_WTR4_PAR	Participant weight	Orgsampinfo_Tstatus = 1 (Ticket Participant Sample)
R4_WTR4_COM	Composite weight	Orgsampinfo_Tstatus = 1 or 2 (Combined Sample)

It is not necessary to subset the file when using the weights and, in fact, subsetting the file may result in incorrect estimates and problems with running the computer software.[69] The weights equal 0.0 for any case that is not in the analysis population. The variable OrgSampInfo_Tstatus identifies whether the case was selected for the Ticket Participant Sample (Orgsampinfo_Tstatus=1) or for the Representative Beneficiary Sample (Orgsampinfo_Tstatus=2). If the population of interest is the national beneficiary population, the Representative Beneficiary Sample weight (R4_WTR4_BEN) should be used. This variable has a value greater than 0.0 for 2,298 cases (where Orgsampinfo_Tstatus=2) and a missing weight value for the 2,780 participant sample cases. If the population of interest is the TTW participant population, the Ticket Participant Sample weight (R4_WTR4_PAR) should be used. This variable has a value greater than 0.0 for 2,780 participant cases (where Orgsampinfo_Tstatus=1) and a missing weight value for the 2,298 beneficiary cases (where Orgsampinfo_Tstatus=2).

A composite sample weight (R4_WTR4_COM) that combines the Ticket Participant Sample and the Representative Beneficiary Sample is also provided on the Restricted Use File (using all 5,078 cases). While this weight was provided to increase the sample size of the TTW participants for analyses of the national beneficiary population, it adds minimal additional analytic power. This weight can be used, however, in lieu of the Representative Beneficiary Sample weight (R4_WTR4_BEN) for analysis of the national beneficiary population. When using the combined beneficiary and participant weight, the variable "flagparti" (rather than OrgSampInfo_Tstatus) can be used to identify Ticket participants (flagparti=1). As discussed in Chapter II, 37 cases sampled as part of the Representative Beneficiary Sample also appeared on the Ticket Participant sampling frame. These cases can be identified as participants when using the combined weight using the variable flagparti.

C. Estimating Sampling Variance for NBS

The sampling variance of an estimate derived from survey data for a statistic (such as a total, a mean or proportion, or a regression coefficient) is a measure of the random variation among

[69] The design-based sampling variance estimate is best computed using the full data file because if subsetting is performed, some values for the design-based sampling variance parameters will be missing in the subset file. This can cause the software to provide incorrect sampling variance estimates or the computer program may fail to run properly.

estimates of the same statistic computed over repeated implementation of the same sample design, with the same sample size, on the same population. The sampling variance is a function of the population characteristics, the form of the statistic, and the nature of the sampling design. The two general forms of statistics are linear combinations of the survey data (for example, a total) and nonlinear combinations. The latter include the ratio of two estimates (for example, a mean or proportion in which both the numerator and denominator are estimated) and more complex combinations, such as regression coefficients. For linear estimates with either simple sample designs (such as a stratified or unstratified simple random sample) or complex designs (such as stratified multistage designs), explicit equations are available to compute the sampling variance. For the more common nonlinear estimates with simple or complex sample designs, explicit equations generally are not available, and various approximations or computational algorithms provide an essentially unbiased estimate of the sampling variance.

The NBS sample design involves stratification and unequal probabilities of selection. Variance estimates calculated from the NBS data must incorporate the sample design features to obtain the correct estimate. Standard statistical packages such as SAS, STATA, and SPSS are not appropriate for analyzing data from complex survey designs such as the NBS design. Standard packages typically assume independent, identically distributed observations or simple random sampling with replacement. Although the simple random sample (SRS) variance may approximate the true sampling variance for some surveys, it is likely to substantially underestimate the sampling variance with a design as complex as that used for the NBS. Complex sample designs have led to the development of a variety of software options that require the user to identify essential design variables such as strata, clusters, and weights.[70]

The most appropriate sampling variance estimators for complex sample designs such as the NBS are the procedures based on the Taylor series linearization of the nonlinear estimator using explicit sampling variance equations, and the procedures based on forming pseudo-replications[71] of the sample. The Taylor series linearization procedure is based on a classic statistical method in which a nonlinear statistic can be approximated by a linear combination of the components within the statistic. The accuracy of the approximation is dependent on the sample size and the complexity of the statistic. For most commonly used nonlinear statistics (such as ratios, means, proportions, and regression coefficients), the linearized form has been developed and has good statistical properties. Once a linearized form of an estimate is developed, the explicit equations for linear estimates can be used to estimate the sampling variance. Because the explicit equations can be used, the sampling variance can be estimated using many features of the sampling design (for example, finite population corrections, stratification, multiple stages of selection, and unequal selection rates within strata). This is the basic variance estimation procedure used in all SUDAAN, and the survey procedures in SAS, STATA, and other software packages that accommodate simple and complex sampling designs. To

[70] A website that reviews software for variance estimation from complex surveys, created with the encouragement of the Section on Survey Research Methods of the American Statistical Association, is available on-line at http://www.fas.harvard.edu/~stats/survey-soft/survey-soft.html. The site lists software packages available for personal computers, and provides direct links to the home pages of these packages. The site also contains articles and links to articles that provide general information about variance estimation, as well as links to articles that compare features of the software packages.

[71] Pseudo-replications of a specific survey sample, as opposed to true replications of the sampling design, entail the selection of multiple independent subsamples from the original sample data using the same sampling design. These subsamples can be random (as in a bootstrap) or restricted (as in Balanced Repeated Replication).

calculate the variance, sample design information (such as stratum, analysis weight, and so on) is needed for each sample unit.

Currently, more survey data analysis software packages use the Taylor series linearization procedure and explicit sampling variance equations. Therefore, we developed the variance estimation specifications necessary for the Taylor series linearization (PseudoStrata and PseudoPSU). Appendix K provides example code for the procedure using SAS and SUDAAN.[72] Details on SAS syntax are available from SAS (SAS Institute 2004); details on SUDAAN syntax are available from RTI International (Research Triangle Institute 2004).

D. Codebook

To aid the user, Mathematica developed two codebooks: one for the Restricted Use File and one for the Public Use File: "The National Beneficiary Survey: Round 4 Public Use File Codebook" (Rall et al. 2012) and "The National Beneficiary Survey: Round 4 Restricted Use File Codebook" (Rall et al. 2012). Both codebooks are available as separate reports and can be obtained from SSA. The Public Use File codebook is available on SSA's website (http://www.socialsecurity.gov/disabilityresearch/publicusefiles.html).

The codebooks provide extensive documentation for each variable on the file including variable name, label, position, variable type and format, question universe, question text, number of cases eligible to receive each item, constructed variable specifications, and user notes. The codebooks include frequency distributions and means as appropriate.

[72] The example code provided in Appendix J is for simple descriptive statistics using the procedures DESCRIPT in SUDAAN and SURVEYMEANS in SAS. Other procedures in SAS (SURVEYREG, SURVEYFREQ, and SURVEYLOGISTIC) and in SUDAAN (CROSSTAB, REGRESS, LOGISTIC, MULTILOG, LOGLINK, and SURVIVAL) are available for more complex analyses. Since SUDAAN was created specifically for survey data, the range of analyses that can be performed with these data in SUDAAN is much wider than in SAS.

IX. REFERENCES

Agresti, A. Categorical Data Analysis. New York: John Wiley and Sons, 1990.

Akaike, H. "A New Look at the Statistical Model Identification." IEEE Transaction on Automatic Control, AC-19, 1974, pp. 716-723.

Barrett, K., S. Skidmore, and D. Wright. "National Beneficiary Survey Round 4 (volume 2 of 3): Cleaning and Identification of Data Problems." Washington, DC: Mathematica Policy Research, February 2012.

Bethel, J. and D. Stapleton. "Evaluation Design For The Ticket To Work Program: Final Survey Sample Design." Prepared for the Social Security Administration. Washington, DC 2002.

Biemer, P. "Total Survey Error: Design, Implementation, and Evaluation." *Public Opinion Quarterly*, vol 74, no. 5, 2010, pp. 817-848.

Biggs, D., B. deVille, and E. Suen. "A Method of Choosing Multiway Partitions for Classification and Decision Trees." *Journal of Applied Statistics*, vol. 18, 1991, pp. 49-62.

Cox, D.R., and E. J. Snell. The Analysis of Binary Data, Second Edition. London: Chapman and Hall, 1989.

Folsom, R., F. Potter, and S. Williams. "Notes on a Composite Site Measure for Self-Weighting Samples in Multiple Domains." Proceedings of the American Statistical Association Section on Survey Research Methods, 1987.

Grau, E., K. Barrett, D. Wright, Y. Zheng, Barbara Carlson, F. Potter, and S. Skidmore. "National Beneficiary Survey Round 4 (volume 1 of 3): Editing, Coding, Imputation, and Weighting Procedures." Washington, DC: Mathematica Policy Research, February 2012.

Grau, E., K. Barrett, and D. Wright. "National Beneficiary Survey Round 4: Nonresponse Bias Analysis." Washington, DC: Mathematica Policy Research, February 2012.

Hosmer, D.W., Jr., and S. Lemeshow. "Goodness-of-Fit Tests for the Multiple Logistic Regression Model. Communications in Statistics, Theory and Methods, vol. A9, no. 10, 1980, pp. 1043-1069.

Kass, G.V. "An Exploratory Technique for Investigating Large Quantities of Categorical Data." Applied Statistics, vol. 29, 1980, pp. 119-127.

Magidson, J. "SPSS for Windows CHAID Release 6.0." Belmont, MA: Statistical Innovations, Inc., 1993.

Mitchell, S., A. Ciemnecki, K. Cybluski, and J. Markesich. "Removing Barriers to Survey Participation for Persons with Disabilities." Prepared for Cornell University. Washington, DC: The Employment and Disability Institute, 2004.

NAACCR Expert Panel on Hispanic Identification. "Report of the NAACCR Expert Panel on Hispanic Identification 2003." Springfield, IL: North American Association of Central Cancer Registries, 2003.

Rall, K., D. Wright, R. Scurato, and S. Khambhati. "The National Beneficiary Survey: Round 4 Public-Use File Codebook." Washington, DC: Mathematica Policy Research, February 2012.

Rall, K., D. Wright, R. Scurato, and S. Khambhati. "The National Beneficiary Survey: Round 4 Restricted-Use File Codebook." Washington, DC: Mathematica Policy Research, February 2012.

Research Triangle Institute. SUDAAN Language Manual, Release 9.0. Research Triangle Park, NC: Research Triangle Institute, 2004.

SAS® Institute. SAS/STAT 9.1 User's Guide. Cary, NC: SAS Institute, 2004.

Thornton, C., G. Livermore, D. Stapleton, J. Kregel, J., T. Silva, B. O'Day, T. Fraker, W. G. Revell Jr., H. Schroeder, and M. Edwards. "Evaluation of the Ticket to Work Program: Initial Evaluation Report." Washington, DC: Mathematica Policy Research, 2004.

U.S. Department of Education. National Center for Education Statistics. "A Study of Imputation Algorithms." Working Paper No. 2001-17. Ming-xiu and Sameena Salvucci. Washington, DC. U.S. Department of Education, 2001.

U.S. Department of Health and Human Services (USHSS), Health Resources and Services Administration, Bureau of Health Professions. Area Resource File (ARF). Rockville, MD: USDHHS, 2003.

Wright, D., K. Barrett, S. Skidmore. "National Beneficiary Survey: Round 4 Questionnaire." Washington, DC: Mathematica Policy Research, February 2012.

MATHEMATICA
Policy Research

www.mathematica-mpr.com

Improving public well-being by conducting high-quality, objective research and surveys

Princeton, NJ ■ Ann Arbor, MI ■ Cambridge, MA ■ Chicago, IL ■ Oakland, CA ■ Washington, DC