HEALTH AND RETIREMENT STUDY

National Death Index
Deceased Respondent Cause of Death
1992-2022

Restricted Data

Data Description

April 2025

To the Restricted Data Investigator: Use of this data product is limited to researcher(s) who have obtained authorization from the Health and Retirement Study and the University of Michigan.

If there are any questions about this data set and its use, refer to the HRS Restricted Data Web Site (https://hrs.isr.umich.edu/data-products/restricted-data) or contact the HRS Help Desk (hrsquestions@umich.edu).

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1. Overview

The Health and Retirement Study (HRS) is a national longitudinal study of the economic, health, marital, and family status, as well as public and private support systems, of older Americans. The HRS is a rich source of longitudinal, cross-sectional data for researchers and policymakers who study aging. Funding for the Health and Retirement Study is provided by the National Institute on Aging at NIH (U01 AG009740), with supplemental support from the Social Security Administration. The study is conducted by the Institute for Social Research (ISR) at the University of Michigan.

2. Obtaining the Data

2a. Access to Restricted National Death Index Data

Although most HRS data sets are available to the public without restriction, certain HRS data sets contain sensitive respondent information and are only available under terms of a formal agreement negotiated between the researcher and HRS. Prospective users of HRS restricted data may obtain access through the Michigan Center on the Demography of Aging (MiCDA) Virtual Desktop Infrastructure. For instructions on how to proceed, visit the HRS Restricted Data Web site. If you have questions, contact the HRS Restricted Data Applications Processing Team (hrsrdaapplication@umich.edu) by email.

2b. Restricted Data Agreement

This restricted data set is intended for exclusive use by you and the persons (if any) specified in your restricted data agreement. It is not available to LINKAGE or self-hosted research users. Access to this dataset is limited to users who have been approved for access to the MiCDA VDI by the Health and Retirement Study and the University of Michigan.

2c. Publications Based on Restricted Data

All restricted data agreements require researcher to inform HRS of any papers, publications, or presentations based on restricted data sets. Researchers should send a bibliographical reference (including a URL link whenever possible) for each item to hrsrdaapplication@umich.edu with "Attn: Papers and Publications" in the subject line. Whenever possible a PDF-formatted copy of the publication should be included. As an alternative, publications may be transmitted in paper format by postal mail:

```
Health and Retirement Study
Attn: Papers and Publications
The Institute for Social Research, Room 3450
P.O. Box 1248
Ann Arbor, Michigan 48106-1248
```

3. Data File Contents

This version of the *HRS National Death Index Respondent Matches* data set replaces all previously released HRS NDI information products. This data set is made up of three sections:

- **Section A** has two parts: (1) Information created from HRS records submitted to the National Center for Health Statistics (NCHS) for matching purposes. (2) Information from the matching NDI record related to match quality and probabilistic scoring. All records are uniquely identified by Household Identifier (HHID) and Person Number (PN).
- **Section B** contains ICD-9 cause of death information for respondents who died prior to 1999. Records are linked to Section A by Household Identifier (HHID) and Person Number (PN).

- **Section C** contains ICD-10 cause of death information for respondents who died in 1999 or thereafter. Records are linked to Section A by Household Identifier (HHID) and Person Number (PN).

See the *NDI User Guide* (included with this restricted data product) for additional information on the content of each section. Contents of the full distribution set are listed below.

Directory	File	Type
.\hrsndi\docs\	NDI2022a_r.txt NDI2022b_r.txt NDI2022c_r.txt	Codebook files (ASCII text)
	NDIUserGuide.pdf ICD9_Codes.pdf ICD9_Recodes.pdf ICD10_Codes.pdf ICD10_Recodes.pdf	Documentation from NCHS
.\hrsndi\ascii\data\	NDI2022a_r.da NDI2022b_r.da NDI2022c_r.da	Data files (ASCII text)
.\hrsndi\ascii\sas\	NDI2022a_r.sas NDI2022b_r.sas NDI2022c_r.sas	SAS program statements
.\hrsndi\ascii\spss\	NDI2022a_r.sps NDI2022b_r.sps NDI2022c_r.sps	SPSS program statements
.\hrsndi\ascii\stata\	NDI2022a_r.dct/.do NDI2022b_r.dct/.do NDI2022c_r.dct/.do	Stata dictionary and "do" files
.\hrsndi\built\sas\	NDI2022a_r.sas7bdat NDI2022b_r.sas7bdat NDI2022c_r.sas7bdat	SAS system files
.\hrsndi\built\spss\	NDI2022a_r.sav NDI2022b_r.sav NDI2022c_r.sav	SPSS system files
.\hrsndi\built\stata\	NDI2022a_r.dta NDI2022b_r.dta NDI2022c_r.dta	Stata system files

This distribution contains pre-built versions of the SAS, SPSS, and Stata system files. Information on how to build system files is contained in the Appendix.

4. HRS Processing Steps

4a. Finder File Submitted to NDI

4.a.1. Finder Build Procedures

The finder file submitted by HRS to NDI consisted of several groups based on respondents' interview history, vital status, and participation as of 2022. The years to be searched started with the last year HRS obtained an interview result (LASTKNOWNALIVE). For never-interviewed cases, the year the household entered the survey served as the start year.

Respondents known to be alive in 2022 were not searched. These were cases that were part of the HRS 2022 sample, were not designated as exit cases, and had some form of contact confirming they are alive. Since they were considered active when the finder was created, they were not targeted for further search.

HRS Finder file search categories were:

- Attritors – Cases that appear in the HRS tracker but are no longer part of the 2022 sample and have not been recorded as deceased. These respondents are considered to have left the study for reasons other than death.
- Earlier Deceased – Individuals recorded as deceased in the HRS tracker file, specifically those assigned an interview type of 11 (proxy interview after death) or 15 (deceased/no interview) in any wave through 2020.
- Recent Deceased – Includes respondents who were classified as Exit cases in the 2022 sample, indicating they died prior to or during the 2022 interview cycle.
- Unknown status – Cases included in the 2022 sample that are not Exit cases, but have had no confirmed contact establishing that they are still living; their current status remains unresolved.

See Table 2, below, for a summary of finder file sent/matched results

4.a.2. NDI Finder File Requirements

The NDI search process requires submission of a 100-character text/flat file with information in specific columns (see below). To be eligible for an NDI search, each record must contain at least one of the following combinations of data items:

- FIRST and LAST NAME and SOCIAL SECURITY NUMBER
- FIRST and LAST NAME and MONTH and YEAR OF BIRTH
- SOCIAL SECURITY NUMBER and full DATE OF BIRTH and SEX

Note: Tracker records with last and first name information were not submitted by HRS.

4.a.3. NDI Data Items

Content	Columns
LAST NAME	(1-20)
FIRST NAME	(21-35)
MIDDLE INITIAL	(36)
SOCIAL SECURITY NUMBER	(37-45)
MONTH OF BIRTH	(46-47)
DAY OF BIRTH	(48-49)
YEAR OF BIRTH	(50-53)
FATHER'S SURNAME	(54-71)
AGE UNIT (at death)- CALCULATED	(72)
NUMBER OF AGE UNITS (at death) – CALCULATED	(73-74)
SEX	(75)
RACE	(76)
MARITAL STATUS	(77)
STATE OF RESIDENCE	(78-79)
STATE OF BIRTH	(80-81)
CONTROL/ID NUMBER RANDOM HRS ID	(82-91)
OPTIONAL USER DATA	(92-97)
BLANK FIELD	(98-100)

4.b. HRS Selection Criteria

The NDI search process produces the files listed below. (Files used by HRS are in bold text.)

Description	***File***	***N received from NDI***	***N after initial processing***
Edit Results	[EDITS]		
Summary Retrieval Statistics	[SUMMARY]		
NDI Retrieval Report	[REPORT]		
Combined File of Matching User and NDI Records	**[COMBINED]**	**239,770**	**25,673**
Cause of Death File	**[CAUSE]**	**32,221**	**25,673**
Cause of Death Report	[PRTCAUSE]		
Death Certificate Request Forms	[REQFORMS]		
Matching User Records	**[MATCH]**	**31,090**	**25,673**
Nonmatching User Records	**[NOMATCH]**	**23,158**	**23,158**
Rejected User Records	[REJECTS]		

Since HRS submitted multiple search requests for respondents not known to be deceased, the first step in processing the COMBINED file was to select the best match as provided by NDI (MATCHSEQ=1). This had the effect of removing records with duplicate HHIDPN values from consideration. The next step was to select for an NDI probability match score (PROBSCORE) greater than or equal to 40 as a cut-point.[1] Note: This PROBSCORE value has been used in all previous HRS-NDI file creation procedures.

[1] See *NDI User's Guide Appendix A – Probabilistic Scoring Approach for Assessing National Death Index Match Results* for information on how PROBSCORE is created and advice on evaluation of true matches.

The COMBINED file was then reviewed for valid matches based on the NDI STATUSCODE and CLASSCODE criteria using these criteria: [2]

- Assumed matches: STATUSCODE=1 and CLASSCODE=1:
- Possible matches: STATUSCODE=1 and CLASSCODE=2 or 3:
- "Not Good" matches: STATUSCODE=1 and CLASSCODE in (4 5) and PROBSCORE >= 40) or (STATUSCODE=0 and PROBSCORE >=40

4.c. Results

Table 1: COMMON file records matched with the Finder file and evaluated as valid

MATCHTYPE	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Assumed (1)	3273	15.74	3273	15.74
Possible (2)	17411	83.71	20684	99.45
Not Good (3)	114	0.55	20798	100.00

Table 2: Finder File Send/Match Summary

Status	NDI Flag	Frequency	Percent	Cumulative Frequency	Cumulative Percent
ORIGINAL FINDER	ATTRITORS	4857	16.90	4857	16.90
	EARLIER DECEASED	17798	61.94	22655	78.84
	RECENT DECEASED	1310	4.56	23965	83.40
	UNKNOWN STATUS	4771	16.60	28736	100.00
FINDER MATCHED	ATTRITORS	1779	8.50	1779	8.50
	EARLIER DECEASED	17235	82.36	19014	90.86
	RECENT DECEASED	1264	6.04	20278	96.90
	UNKNOWN STATUS	649	3.10	20927	100.00
FINDER NOT MATCHED	ATTRITORS	3078	39.42	3078	39.42
	EARLIER DECEASED	563	7.21	3641	46.63
	RECENT DECEASED	46	0.59	3687	47.21
	UNKNOWN STATUS	4122	52.79	7809	100.00

[2] See *NDI User's Guide, Chapter 4 – Assessing NDI Output* for a discussion of approaches to validation of records contained in the COMBINED file.

5. If You Need to Know More

This document is intended to serve as a brief overview that provides guidelines for using this data product. If you have questions or concerns that are not adequately covered here or on our Web site, or if you have any comments, please contact us. We will do our best to provide answers.

5a. HRS Internet Site

Health and Retirement Study public release data and additional information about the study are available on the Internet. To access public data or to find out more about restricted data products and procedures, visit the HRS Web site.

5b. Contact Information

If you need to contact us, you may do so by using one of the methods listed below.

Internet: Help Desk at the HRS Web site (https://hrs.isr.umich.edu/help)

E-mail: hrsquestions@umich.edu

Postal Service:
Health and Retirement Study
The Institute for Social Research
426 Thompson Street, 3450 ISR
Ann Arbor, Michigan 48104

Appendix: Installation Information for System Administrators

1. Distribution Set

This restricted data set is packaged for distribution in a ZIP file, `HRSNDI2022.zip`. In order to keep the contents secure, the ZIP file has been encrypted using WinZIP 256 bit AES encryption. SAS, Stata, and SPSS system files are provided as part of this distribution set and can be used as is. Extract these files plus the data description (this file), and the codebook file.

To build system files, extract the ASCII text data file(s), the program statement file(s) matching the analysis environment, the data description (this file), and the codebook file. If you require a special file format or experience system problems, please contact the HRS Help Desk. If all files are decompressed, they will require approximately 47 MB of free space on your storage device.

1-1. Windows Environment

Copy the ZIP file to the appropriate Windows work folder. Use a third-party[3] file decompression tool such as **WinZIP** or **7-zip** to extract the ZIP folder contents. When you are prompted for the pass-phrase, respond with the character string received separately. The output will be the files listed in Section 3, above.

1-2. UNIX/Linux Environment

Copy the ZIP file to the appropriate folder. Use the ZIP file decompression software installed on your system, (e.g. **7-zip, gunzip**) to decrypt and extract the ZIP folder contents. When you are prompted for the pass-phrase, respond with the character string received separately. The output will be the files listed in Section 3, above.

1-3. Macintosh OS X Environment (10.4.x and above)

Copy the ZIP file to the appropriate folder and use **Stuffit-Expander** to decrypt and extract the ZIP folder contents. When you are prompted for the pass-phrase, respond with the character string received separately. The output will be the files listed in Section 3, above.

Note: MiCDA Enclave Virtual Desktop Environment users are given access to pre-built SAS, Stata and SPSS versions of this dataset; therefore, the information in this appendix only applies to system administrators.

[3] The built-in Windows decompression utility will not process AES-256 bit encrypted zip files; it halts with "an unexpected error is keeping you from copying the file".

2. Program Statements

This restricted data product is distributed with pre-built versions of SAS, Stata, and SPSS system files. Once these have been extracted from the distribution medium no further action is necessary. Anyone who wishes to build system files using the included ASCII text data file(s) and SPSS, SAS or Stata program statements should read on. [4]

2-1. Using the Files with SAS

To create a SAS system file from an ASCII data set, two file types must be present -- .sas program statement files and .da data files. To create a SAS system file, load each **.** `sas` file into the SAS Program Editor. If the *.sas file is located in "c:\hrsndi\ascii\sas" and the corresponding data file is located in "c:\hrsndi\ascii\data", run the file as is. A SAS system will be saved to directory "c:\hrsndi\ascii\sas". If the files are not located in the specified directories, edit the **.** `sas` file to reflect the proper path names prior to running the build procedure.

2-2. Using the Files with SPSS

To create an SPSS system file from an ASCII data set, two file types must be present -- **.** `sps` program statement files and .da data files. To create an SPSS system file, open the *.sps file in SPSS as an SPSS Syntax File. If the *.sps file is located in "c:\hrsndi\ascii\spss" and the data file is located in "c:\hrsndi\ascii\data", run the file as is. An SPSS system file will be saved to directory "c:\hrsndi\ascii\spss". If the files are not located in the specified directories, edit the **.** `sps` file(s) to reflect the proper path names prior to running build procedure.

2-3. Using the Files with Stata

To use Stata with an ASCII data set, three file types must be present -- .dct files, .do files, and .da data files. Files with the suffix ".da" contain the raw data for Stata to read. Files with the suffix ".dct" are Stata dictionaries used by Stata to describe the data. Files with the suffix ".do" are short Stata programs ("do files") which you may use to read in the data. Load the .do file into Stata and then submit it. If the *.do and .dct files are located in "c:\hrsndi\ascii\stata" and the data file is located in "c:\hrsndi\ascii\data", you can run the .do file as is. If the files are not located in these directories, you must edit the **.** `do` and **.** `dct` files to reflect the proper path names before you run the files.

3. Non-Windows Environments

Non-Microsoft users should modify the default Windows file structure syntax to match that of their own operating system. The following examples should work for both Macintosh OS X and any Unix/Linux distribution. Open the SAS program file(s), SPSS syntax file(s) or the Stata do/dct files in an ASCII editor and make the changes indicated below.

3.1 SPSS in an OSX environment

In this example, we assume that the user has extracted the files from the *HRS National Death Index* data set and placed them in a **Desktop** folder called **hrsndi** with the ASCII data file stored in subfolder **data** and the syntax file in subfolder **spss**. Then the commands in the Section A syntax file would be modified to look like this:

[4] While a specific setup is not required for using HRS files, we have traditionally suggested a directory structure for the Windows environment to be used in building system files. By using this directory structure (or a Unix equivalent), you will not have to change the path name references in your data descriptor files. If you use a different structure, just change the directory references in the program files.

```
FILE HANDLE hrsndi /name='Desktop/hrsndi/data/ndi2022a_r.da' RECL=__.
DATA LIST FILE= hrsndi/
HHID 1-6(A)
[rest of syntax file goes here]
.
execute.
SAVE /outfile 'Desktop/hrsndi/spss/ndi2022a_r.sav'.
Execute.
```

Repeat this process for the other sections.

3.2 STATA in an OS X Environment

In the following example we assume that:

- The username is "user1"
- The encrypted zip file containing restricted data has been copied to the user's desktop.
- The user has decrypted /decompressed the zip file (use Stuffit for OS X) into a desktop folder named **hrsndi**
- The statistical package is stata

File `NDI2022a_r.do` should be modified as follows:

Change…

```
infile using c:\hrsndi\ascii\stata\ndi2022a_r.dct
```

To…

```
infile using /Users/user1/Desktop/hrsndi/stata/ndi2022a_r.dct
```

Change…

```
save c:\hrsndi\ascii\stata\ndi2022a_r.dta
```

To…

```
save /Users/user1/Desktop/hrsndi/stata/ndi2022a_r.dta
```

File `NDI2022a_r.dct` should be modified as follows:

Change…

```
dictionary using c:\hrsndi\ascii\data\ndi2022a_r.da {…}
```

To…

```
dictionary using /Users/user1/Desktop/hrsndi/data/ndi2022a_r.da {…}
```

Repeat this process for the other sections.