Documentation of Mortality Statistics and Cause of Death Information for MIDUS Core Samples (National and Milwaukee)

This memo accompanies an updated mortality dataset containing 2,459 decedents from the MIDUS Core National and Milwaukee samples that were ascertained via NDI searches up to the end of 2022.

In 2021, all MIDUS Core sample, regardless of prior known decedent status, were submitted to the National Death Index (NDI) to find new decedents, confirm known decedents, and obtain cause of death information. Two NDI Plus[1] searches were conducted: NDI Final Data Search for years 1995 through 2019; and NDI Early Release Search for 2020 that contains approximately 95% of recorded U.S. deaths that occurred in 2020 according to NDI. Information from 7,699 Core individuals with sufficient minimum matching criteria[2] were submitted to the NDI. Based on the results of the NDI Plus search, 2,124 decedents were ascertained.

In 2023, all MIDUS Core sample were resubmitted to the NDI to obtain updated mortality information. Similar as the NDI Plus Search in 2021, two NDI searches were conducted: NDI Final Data Search for 2020 and 2021; as well as NDI Early Release Search for 2022. Information from 7,699 Core individuals with sufficient minimum matching criteria[2] were submitted to the NDI.

The updated Core mortality dataset:
> **MIDUS_Core_MortalityCauseData_N2459_20230519.sav**

This updated dataset adds 335 newly identified decedents to the 2,124 decedents in the previous mortality dataset for a total of 2,459 decedents in the MIDUS Core sample. Most of the new decedents are those who died in 2021 and 2022. ***Note that the mortality information of deaths through 2021 is considered "complete" due to the NDI Final Data Search, and the mortality information of deaths in 2022 is considered as "close to complete" due to the NDI Early Release Search (95% completion, according to NDI), and mortality information of any deaths in 2023 is considered "partial" because it is only the byproduct of ongoing longitudinal sample maintenance efforts of MIDUS Admin Core (e.g., birthday cards and MIDUS newsletters).***

Note the changes in cause of death information in the current update. The prior mortality data file included only underlying cause of death in ICD-9/10 from the NDI Plus. In the current update, multiple cause of death information in ICD-9/10 are included as well. In addition, simplified categories of cause of death, based on the leading cause of death in the U.S. in recent years, are provided in the mortality data (e.g., heart disease, cancer, CLRD, diabetes, COVID-19, and other disease). Each death certificate contains a single underlying cause of death and up to 20 additional multiple causes of death. Multiple cause of death information in the file was obtained from records-axis codes that are provided from the NDI Plus. See p. 60 of NDI user guide (https://www.cdc.gov/nchs/data/ndi/NDI_Users_Guide.pdf) to learn more about records-axis codes.

The mortality dataset is a flat file containing 2,459 deceased cases, and it contains 42 variables that can be linked to other Core MIDUS datasets via the M2ID.

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[1] Different from NDI routine searches which only provide potential decedent matches, the NDI Plus search also provides the cause of death (ICD-9/10 Codes) for most of the true match cases.
[2] To be eligible for an NDI search, each record must contain at least one of the following combinations of data items: (a) First and last name and SSN, (b) First and last name and month and year of birth, (c) SSN and full date of birth and sex.

The focal variables are:

- DECEASED indicates decedent status.

- DOD_M and DOD_Y indicate the month and year of death.

- UNDERCOD_ICD9 and UNDERCOD_ICD10 contain underlying cause of death based on ICD (International Classification of Diseases) codes. For convenience to researchers the MIDUS Admin Core appended descriptive labels to each ICD code using source material provided by NDI. In these two variables, the ICD codes represent the underlying cause of death, which is defined as "(a) the disease or injury which initiated the train of events leading directly to death, or (b) the circumstances of the accident or violence which produced the fatal injury" (World Health Organization; Manual of the International Statistical Classification of Diseases, Injuries, and Causes of Death, based on the recommendations of the Ninth Revision Conference, 1975; Geneva; 1977). For more information about how NDI Plus provides cause of death information, see NDI user guide.
  - Because the MIDUS Core study began in 1995 and includes deaths from that year onward, the Core mortality dataset contains two sets of ICD codes:
    - UNDERCOD_ICD9. This variable contains the 9th revision (ICD-9) of the ICD codes and are used by NDI to classify deaths that occurred from 1979 through 1998. Further information on ICD-9 is available from:
      - https://www.cdc.gov/nchs/icd/icd9.htm
    - UNDERCOD_ICD10. This variable contains the 10th revision (ICD-10) of the ICD codes and are used by NDI to classify deaths occurring in 1999 and afterwards. Further information on ICD-10 is also available from:
      - https://www.cdc.gov/nchs/icd/icd10.htm
    - For more information about the differences between ICD-9 and ICD-10 codes, see **Table 1** below.

- NUM_MULTICOD denotes the total number of multiple cause of death available for the decedent.

- MULTICOD_1_ICD9 thru MULTICOD_7_ICD9 contain multiple cause of death information for decedents who died prior to 1998. The file does not have MULTICOD_8_ICD9 thru MULTICOD_12_ICD9 because all deaths in those columns occurred in 1999 or afterwards. Values labels are not attached to these variables because format of ICD-9 codes in multiple cause of death columns are different from the format in the underlying cause of death column. See NDI user guide to check how to interpret ICD-9 codes in the multiple cause of death columns.

- MULTICOD_1_ICD10 thru MULTICOD_12_ICD10 contain multiple cause of death information for decedents who died in 1999 or afterwards.

- UNDERCOD_C, and MULTICOD_1_C thru MULTICOD_12_C contain categorized version of underlying and multiple cause of death information. The original ICD codes were recoded into six categories based on the leading cause of death in the U.S. in recent years: Heart disease, Cancer, CLRD, Diabetes, COVID-19, and Other disease.

Table 1. Key differences between ICD-9-CM and ICD-10-CM and ICD-10-PCS code sets[3]

Differences Between ICD-9-CM and ICD-10 Code Sets		
	ICD-9-CM	**ICD-10 code sets**
Procedure	3,824 codes	71,924 codes
Diagnosis	14,025 codes	69, 823 codes
ICD-10 Code Structure Changes (selected details)		
	Old	**New**
Diagnosis Structure	ICD-9-CM • 3 -5 characters • First character is numeric or alpha • Characters 2-5 are numeric	ICD-10-CM • 3 -7 characters • Character 1 is alpha • Character 2 is numeric • Characters 3 – 7 can be alpha or numeric
Procedure Structure	ICD-9-CM • 3-4 characters • All characters are numeric • All codes have at least 3 characters	ICD-10-PCS • ICD-10-PCS has 7 characters • Each can be either alpha or numeric • Numbers 0-9; letters A-H, J-N, P-Z

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[3] Source: CDC website https://www.cdc.gov/nchs/icd/icd10cm_pcs_background.htm