UNDERSTANDING AND USING MIDUS

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University of Wisconsin-Madison
Institute on Aging
Overview

• MIDUS background:
  • Study design, unique features, content/measures

• Research data access and documentation
  • Importance of structured metadata
  • Using Data Documentation Initiative (DDI)
  • Facilitating documentation and discovery of longitudinal research data

• Demonstrate MIDUS Portal
  • Metadata standards → find, access, interpret, use
MIDUS Background

Midlife in the United States
A National Study of Health & Well-Being

• **Baseline**: 1995
  - Harvard University
  - Funded by MacArthur Foundation
  - National sample: N=7,108
  - Ages 25-74
MIDUS Background
- Unique Features

- Multidisciplinary
  - “Bio-psycho-social” approach
  - Extensive assessments and data types
MIDUS Background
-Multi-disciplinary framework

Psychological & Social Factors
Psychological:
- Personality
- Affect
- Coping
- Health Beliefs

Social:
- Social Support
- Spousal Support
- Child Abuse
- Parent-Child Ties

Life Challenges
Daily Stressors (e.g., work overload, family arguments, traffic problems)
Chronic Stressors (e.g., caregiving, perceived discrimination, perceived inequalities, work-family spillover, unemployment)
Acute Events (e.g., divorce, remarriage, job change, deaths, relocation)

Health Behaviors
- Smoking
- Drinking
- Hormone Therapy
- Preventive & Alternative Healthcare

Neurobiological Mechanisms
Brain
Amygdala • Ventral Striatum • Prefrontal Cortex • Connectivity

Gene Expression
Inflammatory
- Interleukin-6
- C-Reactive Protein (CRP)
- Inter cellular Adhesion Molecules (ICAM)
- E-Selectin
- Expanded Cytokine Panel

Glucose Metabolism
- Glucose
- Insulin
- Glycosy. Hemog.
- Insulin-like Growth Factor1

Neuroendocrine
- Cortisol/DHEA-S
- Alpha amylose
- Epinephrine/Norepine.

Cardiovascular
- Blood Pressure
- Cholesterol
- HDL Function
- Waist-Hip Ratio
- Ankle Brachial Index

- Heart-Rate Variability
- Fibrinogen
- Antioxidants

Musculoskeletal
- Bone Mineral Density
- Bone Turnover
- Body Impedence
- Creatinine
- Gait Analysis

Integrative Biological Risk

Health/Illness
Mental:
- Depression
- Anxiety
- Psychological Well-Being
- Cognitive Functioning

Physical:
- Subjective Health
- Health Comparisons
- Chronic Conditions
- Symptoms
- Disability/Functional Limitations

Mortality
PROJECT 1
(SURVEY OF A NATIONAL SAMPLE)
Assessed a wide array of psychological constructs (e.g., personality, psychological well-being, positive and negative affect, sense of control, goal orientations) and demographic characteristics (e.g., gender, marital status, socioeconomic standing, employment status), along with extensive health measures (mental and physical).

MODE: 30-minute Phone Interview and Two 50-page Self-Administered Questionnaires

THE MIDUS II PROJECTS

PROJECT 2
(Daily Diary Study)
8 days of daily experience obtained via phone interviews. (e.g., time use, physical health symptoms and substance use, work productivity, psychological distress)
4 days of salivary cortisol

PROJECT 3
(Cognitive Functioning)
Phone-based cognitive battery (e.g., episodic verbal memory, working memory, verbal ability and speed, fluid intelligence/reasoning, speed of processing, episodic verbal memory/forgetting)
Face-to-face assessment of cognitive capacities

PROJECT 4
(Biomarkers)
2-Day Clinic Visit: Biomarkers—neuroendocrine, cardiovascular, immune, bone
Physical exam
Medical history
Medications
Sleep assessments
Laboratory challenge study—heart-rate variability, blood pressure, cortisol

PROJECT 5
(Neuroscience)
Affective reactivity & recovery:
- baseline electroencephalography (EEG)
- task-related EEG
- task-related electromyography (EMG; eyelink startle response, post auricular startle reflex, corrugator supercilli activity)
- structural MRI of neuroanatomy
- task event-related fMRI
MIDUS Background
- Unique Features

• Multidisciplinary
  • “Bio-psycho-social” approach
  • Extensive assessments and data types

• Longitudinal
  • Repeated assessments over 25 years

• Multiple samples
  • 2 National RDD (Core and Refresher)
    • Sibling, Twins (within Core)
  • 2 Milwaukee African American (Core and Refresher)
  • 1 Japanese
MIDUS Background
- Longitudinal, multi-disciplinary, multi-sample

Core

M1
Survey n=7105
Cognitive n=302
Daily Diary n=1499

M2
Survey n=4963
Cognitive n=4512
Daily Diary n=2022
Biomarker n=1255
Neuroscience n=331
n=592

M3
Survey n=3294
Cognitive n=2693
Daily Diary
Biomarker
Neuroscience
Gene Expression (new)
Retention- Early Warning (new)

MR1
Survey n=3577
Cognitive n=2763
Daily Diary n=782
Biomarker n=863
Neuroscience n=136
n=508

MIDJA1
Survey n=1027
Biomarker n=382

MIDJA2
Survey n=657
Biomarker n=328

Refresher

Japan
MIDUS Background

- Unique Features

• Multidisciplinary
  • “Bio-psycho-social” approach
  • Extensive assessments and data types

• Longitudinal
  • Repeated assessments over 25 years

• Multiple samples
  • 2 National RDD (Core and Refresher)
    • Sibling, Twins (within Core)
  • 2 Milwaukee African American (Core and Refresher)
  • 1 Japanese

• Rich and integrated data resource
• 28 primary datasets
  • 37,000 variables
  • N ≈ 13,000

• Open Data philosophy
  • Archived/distributed by NACDA/ICPSR
  • Widespread secondary usage since 1999:
    • 136,000 data downloads
    • 24,000 users
    • 1,500 publications
• Documentation
  • Independently understandable

• Metadata
  • Maximize usability
    • FAIR (Findable, Accessible, Interoperable, Reproducible)

• Data Documentation Initiative:
  • A machine-actionable metadata standard to describe social science research data
  • DDI used by
    • NACDA/ICPSR
    • MIDUS
• MIDUS Portal uses Colectica software
  • Variable Search
    • Searches metadata fields such as: variable names, labels, question text, assigned concepts
    • Searches across MIDUS project datasets
  • Harmonization
    • Clarifies the equivalency and relationship of similar variables across waves or samples
  • Data extract
    • Create custom datasets
    • Facilitate accurate merges across numerous datasets
The MIDUS Colectica Portal

http://midus.colectica.org

Welcome to the MIDUS Portal!
This Portal provides access to documentation, richly-structured metadata, and publicly-available data for the MIDUS (Midlife in the United States) study.

The Portal employs Data Documentation Initiative metadata standards and is powered by Colectica software.

Midlife in the United States

MIDUS is a national longitudinal study of health and well-being that was conceived by a multidisciplinary team of scholars interested in understanding aging as an integrated bio-psycho-social process. Begun in 1995, MIDUS has grown to include data from over 12,000 individuals, comprising thousands of variables in different scientific topics.

The MIDUS portal is organized around four primary functions:

- **Homepage**: Data and documentation for individual MIDUS Projects can be found below. Users can browse variables, read abstracts, and download instruments and documentation for each MIDUS Project. Complete Project datasets are also available via links to the official MIDUS archive at ICPSR.
### MIDUS 1 (Core)

**Project 1 (Survey)**
In 1995/96, the MacArthur Midlife Research Network conducted the MIDUS 1 (M1) survey on a national sample of over 7,000 Americans aged 25 to 74. This sample included subsamples of Siblings and Twin Pairs.

**Project 1 (Twin Screener)**
MIDUS 1 screened a national sample of twin pairs that resulted in the MIDUS Twin sample. The data, instrument, and documentation from that screening effort are available here.

**Project 2 (Daily Diary)**
The M1 National Study of Daily Experiences examined the day-to-day lives—particularly the daily stressful experiences—of a subsample of M1 Survey respondents.

### MIDUS 2 (Core)

**Project 1 (Survey)**
In 2004/05, MIDUS 2 (M2) Project 1 provided follow-up on the psychosocial, sociodemographic, and health variables assessed in MIDUS 1.

**Project 1 (Disposition Codes)**
Final disposition codes for the MIDUS 2 phone interview are available here.

**Project 1 (Coded Text)**
Responses to open-ended variables for the MIDUS 2 phone interview and SAQ were coded and are available here.

**Project 1 (SAQxPhone)**
An effort to interview SAQ non-responders via telephone interview resulted in extra SAQ data for 365 M2 respondents.
Variables

Query: smoking or cigarette and age

Item types: Variables

Results 1 to 100 of 172 (0.06 seconds)

A1PA41

Age had first cigarette
At what age did you have your very first cigarette?

RAACA36

Age had first cigarette
At what age did you have your very first cigarette?

A1PA43

Now smoke cigarettes regularly
(IF A1PA41 = NEVER HAD A CIGARETTE; IF A1PA40 = NO OR DK)
Age began to smoke regularly

Variable Description

- **Name**: A1PA42
- **Label**: Age began to smoke regularly
- **Question Text**: At what age did you begin to smoke REGULARLY?
- **Backward Skip**: (IF A1PA41 = NEVER HAD A CIGARETTE; IF A1PA40 = NO OR DK)
- **Dataset**: M1_P1_SURVEY_N7108_20190116

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<th>% of all</th>
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**Valid**: 2650  **Invalid**: 3448  **Min**: 5  **Max**: 56  **Mean**: 18.76  **StdDev**: 4.76

**Lineage**

- M1P1 - A1PA42
- A1PA40

At what age did you begin to smoke REGULARLY?
**Variable Description**

- **Name**: A1PA40
- **Label**: Ever smoked cigarettes regularly

**Backward Skip**: (IF A1PA41 = NEVER HAD A CIGARETTE)

**Forward Skip**: IF A1PA40 = NO OR DK, GO TO A1PA52

**Question Text**: Have you ever smoked cigarettes regularly -- that is, at least a few cigarettes every day?

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<td>NO</td>
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MIDUS Portal
- Explore

Select an item on the left.

Explore currently provides harmonization information for the Survey, Daily Diary, Cognitive, Biomarker, and Neuroscience variables for the U.S. samples. Work is ongoing to harmonize the MIDJA (Japan) variables.
### MIDUS Portal - Explore

#### Survey

**History of Smoking**

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<tr>
<th>Question</th>
<th>M1P1</th>
<th>M2P1</th>
<th>M3P1</th>
<th>MKE1</th>
<th>MKE2</th>
<th>MR1P1</th>
<th>MKER1</th>
<th>M3P7</th>
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<td>Ever smoked cigarettes regularly</td>
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<td>Age began to smoke regularly</td>
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<tr>
<td>Now smoke cigarettes regularly</td>
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<tr>
<td>Cigarettes per day during heaviest year - Current smoker</td>
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<td>Ever tried to quit smoking</td>
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<td>Age last smoked regularly</td>
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<td>Cigarettes per day during heaviest year - Past smoker</td>
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<td>Ever used pipe, cigars, snuff, chew</td>
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<tr>
<td>Lived with smoker growing up - Father</td>
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<tr>
<td>Lived with smoker growing up - Mother</td>
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<tr>
<td>Lived with smoker growing up - Other</td>
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<td>In home anyone smoke or use tobacco current</td>
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<td>At job anyone smoke or use tobacco ever</td>
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<td>At job anyone smoke or use tobacco current</td>
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<tr>
<td>History of Smoking</td>
<td>Age had first cigarette</td>
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<td></td>
<td>Ever smoked cigarettes regularly</td>
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<td></td>
<td>Now smoke cigarettes regularly</td>
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<tr>
<td></td>
<td>Cigarettes per day during heaviest year - Current smoker</td>
<td>A1PA44, B1PA40, C1PA40, BACA40, CACA40, RA1PA40, RAACA40, C7CA40</td>
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<td>Ever tried to quit smoking</td>
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<td></td>
<td>Age last smoked regularly</td>
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<td></td>
<td>Ever used pipe, cigars, snuff, chew</td>
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<td>Lived with smoker growing up - Mother</td>
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<td></td>
<td>Lived with smoker growing up - Other</td>
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<td>In home anyone smoke or use tobacco current</td>
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<td>At job anyone smoke or use tobacco current</td>
<td>B1PA48, C1PA47, BACA48, CACA48, RA1PA48, RAACA48, C7CA48</td>
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</tbody>
</table>
### Blood Creatinine (mg/dL)
- **M2P4:** B4BSCREA
- **MR1P4:** RA4BSCREA

### Blood DHEA-S (ug/dL)
- **M2P4:** B4BDHEAS
- **MR1P4:** RA4BDHEAS
GSA 2021 Demo

This is your active basket.

Variables (12)

- Download Data
  - CSV
  - SPSS
- Download Metadata

- CSV
  - Age had first cigarette
- SPSS
  - Age had first cigarette
- C1PA37
  - Age had first cigarette
- RA1PA37
  - Age had first cigarette
- RAACA36
  - Age had first cigarette
- A1PA41
  - Age had first cigarette
- CACA36
  - Age had first cigarette
- C7CA36
  - Age had first cigarette
- B1PA37
  - Age had first cigarette

Details

- Title: GSA 2021 Demo
- Subtitle: 
- Creator: 
- Description: 
- Citation: 
- Persistent ID: 
- Created: 11/5/2021 9:25:58 PM
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<td>None</td>
<td>Numeric</td>
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<td>96, 97</td>
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<td>A1PA41</td>
<td>Age had first cigarette</td>
<td>{96. NEVER HAD A CIGARETTE}</td>
<td>96, 97</td>
<td>Numeric</td>
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<td>0</td>
<td>8</td>
<td>Right</td>
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<tr>
<td>B1PA37</td>
<td>Age had first cigarette</td>
<td>{96. NEVER HAD A CIGARETTE}</td>
<td>96, 97</td>
<td>Numeric</td>
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<td>0</td>
<td>8</td>
<td>Right</td>
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<td>B4BSCREA</td>
<td>Blood Creatinine (mg/dL)</td>
<td>{98. MISSING}</td>
<td>98, 99</td>
<td>Numeric</td>
<td>8</td>
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<tr>
<td>B4BDHEAS</td>
<td>Blood DHEA-S (ug/dL)</td>
<td>{993. MISSING}</td>
<td>998, 999, 998</td>
<td>Numeric</td>
<td>8</td>
<td>0</td>
<td>8</td>
<td>Right</td>
</tr>
<tr>
<td>BACA36</td>
<td>Age had first cigarette</td>
<td>{96. NEVER HAD A CIGARETTE}</td>
<td>96, 97</td>
<td>Numeric</td>
<td>8</td>
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<tr>
<td>CACA36</td>
<td>Age had first cigarette</td>
<td>{96. NEVER HAD A CIGARETTE}</td>
<td>96, 97</td>
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<td>RA1PA37</td>
<td>Age had first cigarette</td>
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<td>96, 97</td>
<td>Numeric</td>
<td>8</td>
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<td>RAACA36</td>
<td>Age had first cigarette</td>
<td>{96. NEVER HAD A CIGARETTE}</td>
<td>96, 97</td>
<td>Numeric</td>
<td>8</td>
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### GSA 2021 Demo

**Generated on Monday, November 8, 2021 11:08 AM**

**Title**

GSA 2021 Demo

**Data File**

Variable Count: 16

<table>
<thead>
<tr>
<th>MIDUSID - Master ID created by concatenating M2ID, MRID, MIDIA_IDs</th>
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</thead>
<tbody>
<tr>
<td><strong>Type</strong></td>
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<tr>
<td><strong>Data File</strong></td>
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<table>
<thead>
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<th>Invalid</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>13225</td>
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<td>10001</td>
<td>39999</td>
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<table>
<thead>
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<th>SAMPLMAU - Major sample identification (aka Sample)</th>
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<td><strong>Data File</strong></td>
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<th>% of total</th>
<th>% of valid</th>
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<tbody>
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<td>MAIN RDO</td>
<td>3,487</td>
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<td>26.4%</td>
</tr>
<tr>
<td>SIBLING</td>
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<td>7.2%</td>
<td>7.2%</td>
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<tr>
<td>TWIN</td>
<td>1,996</td>
<td>15.1%</td>
<td>15.1%</td>
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<tr>
<td>CITY OVERSAMPLE</td>
<td>759</td>
<td>5.7%</td>
<td>5.7%</td>
</tr>
<tr>
<td>MILWAUKEE</td>
<td>592</td>
<td>4.5%</td>
<td>4.5%</td>
</tr>
<tr>
<td>BOSTON NEW</td>
<td>328</td>
<td>2.5%</td>
<td>2.5%</td>
</tr>
<tr>
<td>MIDUS REFRESHER</td>
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<tr>
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<td>MIDIA</td>
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<th>Minimum</th>
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<tbody>
<tr>
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### MIDUS Portal - Basket

**RABDHEAS - Blood DHEA-S (ug/dL)**

<table>
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<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>StdDev</th>
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<tr>
<td>1239</td>
<td>16</td>
<td>0.9</td>
<td>685</td>
<td>105.12</td>
<td>77.04</td>
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**NOT CALCULATED (Non-RDD cases)**

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<th>Mean</th>
<th>StdDev</th>
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<tbody>
<tr>
<td>2,706</td>
<td>54.5%</td>
<td>2,706</td>
<td>45.4%</td>
<td>2,706</td>
<td>45.4%</td>
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</table>

<table>
<thead>
<tr>
<th>Valid</th>
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<tbody>
<tr>
<td>257</td>
<td>2706</td>
<td>4</td>
<td>3.68</td>
<td>1</td>
<td>0.97</td>
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**Notes**

For details see [Documentation of Post-stratification Weights Created at MIDUS 2](http://dx.doi.org/10.3886/ICPSR36865).

**ICPSR DOI for Project**

[http://dx.doi.org/10.3886/ICPSR36865](http://dx.doi.org/10.3886/ICPSR36865)

**Comparability Notes**

Weight variables computed for national samples or datasets only.

**Develop a Summary Class**

General item availability

### Validation Information

**Missing**

<table>
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<th>Frequency</th>
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<th>% of valid</th>
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<td>2,706</td>
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</table>

**Total**

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<tr>
<td>2,706</td>
<td>54.5%</td>
<td>2,706</td>
</tr>
</tbody>
</table>

*This is a sample of the actual data provided by the MIDUS Portal.*
NACDA - Source for complete data files

• NACDA is the source for complete (and large) MIDUS Project datasets
  • Different software formats (SPSS, SAS, Stata, R, delimited.)

• All MIDUS datasets can be merged at case level
  • Use key case ID variables within each sample:
    • M2ID: MIDUS Core sample
    • MRID: MIDUS Refresher sample
    • MIDJA_ID: Japanese sample
Recap

• MIDUS study design:
  • Longitudinal
  • Multi-disciplinary
  • Multiple cohorts and sub-samples

• MIDUS data:
  • Richly documented diverse data types
  • Available through NACDA or Portal
  • MIDUS Portal:
    ➢ Searchable
    ➢ Internally harmonized
    ➢ Custom datasets and documentation download

• Future: cross-study ‘harmonization’
  • NSHAP, AddHealth, NHATS, WLS, CLOSER
  • Harmonization of concepts, then measures
Questions about MIDUS?

midus.wisc.edu

This research is supported by the following grants from the National Institute on Aging:
U19-AG051426, R03-AG046312, 5P01-AG020166, R01-AG047154