



# MIDUS Workshop Overview and Data Access

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# Important Resources

https://midus.wisc.edu/

https://sites.psu.edu/nsde/

https://www.youtube.com/watch?v=Ga3Mzbi08\_U&t=47s

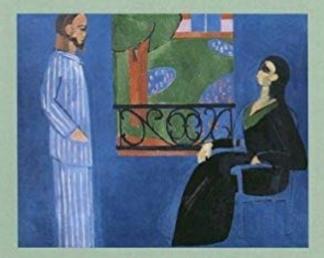
https://www.youtube.com/watch?v=Ga3Mzbi08 U&t=3s

### Overview

- Quick look at MIDUS study design and content
- MIDUS webcite
- Data distribution
  - Importance of documentation and structured metadata
- Using Data Documentation Initiative to facilitate distribution of longitudinal data
  - □ ICPSR and MIDUS Portal
- □ Future Directions
- □ Hands on practice!



# Healthy ARE WE?

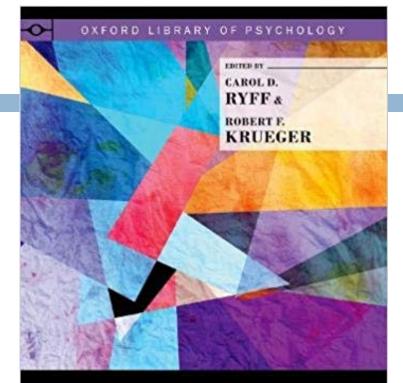


A NATIONAL STUDY OF WELL-BEING AT MIDLIFE

Edited by

Orville Gilbert Brim, Carol D. Ryff, and Ronald C. Kessler





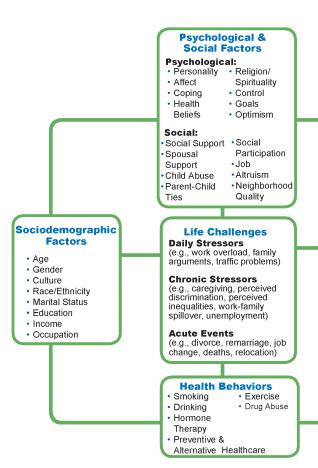
The Oxford Handbook of INTEGRATIVE HEALTH SCIENCE

# **Quick look at MIDUS: Unique Features**

- Multidisciplinary ("biopsychosocial") approach
- Wide age range (25-74 at baseline)
- Assessments over 22 years and counting
- Multiple samples:
  - 2 National RDD (Core and Refresher)
    - Sibling, Twins also within Core
  - 2 African American (Milwaukee Core and Refresher)
  - 1 Japanese



### **Content of MIDUS**



#### **Neurobiological Mechanisms** Brain Amvodala • Ventral Striatum • Prefontal Cortex • Connectivity Gene Expression Neuroendocrine Inflammatory Glucose Metabolism Interleukin-6 Glucose Cortisol/DHEA-S C-Reactive Protein (CRP) Insulin · Alpha amvlase · Glycosy. Hemog. · Epinephrine/Norepine. · Intercellular Adhesion Molecules (ICAM) · Insulin-like Growth E-Selectin Factor1 Expanded Cytokine Panel Cardiovascular Musculoskeletal Blood Pressure Bone Mineral Density Heart-Rate Cholesterol Variability Bone Turnover HDL Function Fibrinogen Body Impedence Waist-Hip Ratio Antioxidants Creatinine · Ankle Brachial Index · 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)

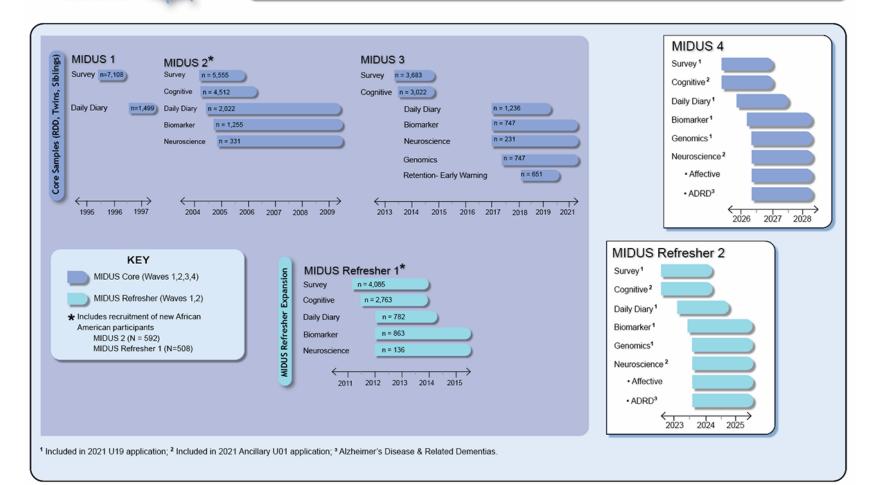
### Affective reactivity & recovery:

- baseline electroencephalography (EEG)
- · task-related EEG
- task-related electromyography (EMG; eyeblink startle response, post auricular startle reflex, corrugator supercilli activity)
- structural MRI of neuroanatomy
- · task event-related fMRI





### MIDUS Timelines, Samples, and Projects



# Day as the Unit of Analysis

"The way we spend our minutes, hours, and days is the way we spend our lives."

Mr. McAninch

Park Forest Middle School



# National Study of Daily Experiences



- Telephone Diary Study Across Eight Consecutive Evenings
- National sample of participants from the daily diary project of MIDUS
- Three waves of data (1995, 2004, 2019)
  - Refresher Cohort (2012)
- (Npeople = 3,509, Ndays = 42,243, Nsaliva samples = 53,252)
- Mean Age = 46 (SD = 12, Range = 25 94)

# 20+ Years with SSRI's Survey Research Center!!



# Day as the Unit of Analysis

- Domains of Daily Experiences
  - Time use (Sleep, Work and Physical Activity)
  - Physical Symptoms (Duration and Intensity)
  - Substance Use (Caffeine, Alcohol, Tobacco)
  - Medications (Confounds of Cortisol)
  - Positive and Negative Mood
  - Activities (Work, Volunteer, Leisure)
  - Stressors (40% of the study days)
  - Positive Events (71% of study days)

### Distribution of Respondents Who Completed Multiple Projects at MIDUS 2

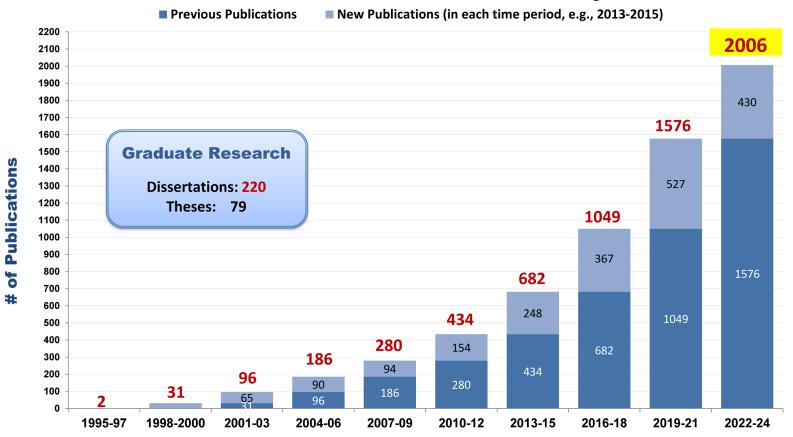
Projects Completed	National	Milwaukee	TOTAL
Survey	4963	592	5555
Survey & Cognition	4206	306	4512
Survey & Daily Diary	1842	180	2022
Survey & Biomarker	1004	201	1255
Survey & Neuroscience	223	108	331
Survey & Cognition & Daily Diary	1 <i>7</i> 83	142	1925
Survey & Daily Diary & Biomarker	876	135	1011
Survey & Cognition & Daily Diary & Biomarker	858	102	960

## What does MIDUS have to distribute?

- □ 20+ project datasets
  - **□** 25,000 variables
  - $\square$  N > 13,000
- Guiding principles regarding distribution
  - Quick turn-around to public (ICPSR)
    - Widespread secondary usage
- Evidence of success:
  - #1 data download at NACDA
  - 1500k data downloads; 52k users
  - □ 2000+ publications



### **Cumulative Total of MIDUS Publications by Year**



**Year Published** 

# What does MIDUS have to distribute?

Fig. 10. MIDUS Publications by Topic

ТОРІС	#
Affect/Emotion	281
Aging	309
Allostatic Load	50
Altruism	51
Biomarkers	304
Cancer	20
Childhood/Early Life	123
Chronic & Acute Challenges	101
Cognitive Function	100
Culture/Country	64
Daily Stress	141
Gender	181
Genetics & Twins	111
Health Behaviors	181
Historical Context/Recession	23
Mental Illness	181
Mortality	39
Neighborhood	33
Neuroscience	21

ТОРІС	#
Non-normative Parenting	20
Obesity/Weight	89
Occupation & Employment	121
Perceived Discrimination	67
Personality	203
Physical Health	508
Psychological Well-being	273
Race & Ethnicity	158
Religion & Spirituality	50
Resilience	51
Sense of Control	107
Sexuality	23
Sleep	60
Social Inequalities/SES	169
Social Relationships/Support	322
Social Responsibility	56
Volunteering	41
Work and Family	45

# Using DDI to Facilitate Distribution

- Data Documentation Initiative: is an international standard for describing social science metadata in distributed network environments. Makes research data:
  - Machine-actionable
  - Independently understandable







# Using DDI to Facilitate Distribution

- Michigan: ICPSR
  - Archive and procedures supported by DDI (Version 2)
- Wisconsin: MIDUS Portal (<a href="http://midus.colectica.org">http://midus.colectica.org</a>)
  - Based on same datasets available at ICPSR
  - □ Using Version 3.2







## What DDI 3.2 Facilitates

- Particular benefits for longitudinal studies
  - Harmonization (internal, post-hoc)
    - Clarifies the related nature of versions of longitudinal and cross-cohort variables
  - Intelligent search function
    - Searches different fields: variable name, label, question text, assigned concepts
    - Search results are arrayed
    - Intelligent searches across ALL 25k MIDUS variables







### The MIDUS Colectica DDI Portal

### Allows Custom Data Extracts

- Researchers can focus on variables of interest
- Facilitate accurate merges across numerous datasets
- Ease data management burden







#### Home

#### Welcome

#### 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.



### \*\*Newly Available MIDUS Data\*\*

#### New Releases

- MIDUS 3 Gene Expression data Feb, 2024
- MIDUS 3 Biomarker data Oct, 2023
- MIDUS Genetics Methylation Age data Aug, 2023

#### Update Releases

- MIDUS Core and Refresher Mortality Feb, 2024
- MIDUS 3 Neuroscience data Feb, 2024
- MIDUS 2 Milwaukee Survey data (MKE1) Feb, 2024

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



#### **MIDUS Open Science Policy**

All MIDUS data are archived and made publicly available—and are thus share-able—via the University of Michigan Inter-university Consortium of Political and Social Research (ICPSR) or the MIDUS Portal. Per ICPSR's Terms of Use researchers obtaining MIDUS data via ICPSR or the MIDUS Portal are not allowed to redistribute that data. Researchers who are required to share data sources used in their particular analysis can refer to the specific MIDUS datasets and documentation published at ICPSR. Because of intellectual property issues related to the sharing of programming, code, or syntax, MIDUS recommends that any such code used to subset, merge, transform or otherwise analyze publicly-available MIDUS datasets be shared by individual researchers on a case-by-case basis.

#### MIDUS Data Use Policy

Any attempts to identify individuals within the study are prohibited and information that could identify individuals directly or by inference must not be released or published. Further, researchers downloading data from the MIDUS Portal agree to not release or disclose information where the number of observations in any given cell of tabulated data is less than or equal to 10.

### MIDUS 1 (Core)

Project 1 (Survey)

Project 4 (Biomarkers)

Project 5 (Neuroscience)

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.	Study Documentation	Browse Variables	Download Full Dataset	Download PDF Codebook
Project 2 (Daily Diary)	The M1 National Study of Daily Experiences examined the day-to-day livesparticularly the daily stressful experiencesof a subsample of M1 Survey respondents.	Study Documentation	Browse Variables	Download Full Dataset	Download PDF Codebook
MIDUS 2 (Core	2)				
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	Study Documentation	Browse ariables	Download Full Dataset	Download PDF Codebook
Project 1 (Disposition Codes)	Final disposition codes for the MIDUS 2 phone interview are available here.	Study	Browse Variables	Download Full	Download PDF

Download PDF

Codebook

PDF

Codebook

Download

PDF

Codebook

Download

PDF Codebook

Study

Documentation

**Documentation Variables** 

**Documentation Variables** 

**Documentation Variables** 

**Browse** 

**Browse** 

Study

Study

Browse

Variables

Download

**Full Dataset** 

**Dataset** 

Download Full

Dataset

Download Full

Dataset

		Documentation Variable
Project 1 (Disposition Codes)	Final disposition codes for the MIDUS 2 phone interview are available here.	Study Browse Documentation Variable
Project 1 (Coded Text)	Responses to open-ended variables for the MIDUS 2 phone interview and SAQ were coded and are available here.	Study Browse

M2 Project 4 introduced comprehensive biomarker assessments on a subsample of M2 respondents, collected at one of three Clinical

M2 Project 5 provided neuroscience assessments on a subsample of respondents in the Biomarker Project.

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.

Research Centers around the country.

		Documentation Variables	Dataset	PDF Codebook
Project 1 (Coded Text)	Responses to open-ended variables for the MIDUS 2 phone interview and SAQ were coded and are available here.	Study Browse Documentation Variables	Download Full Dataset	Download PDF Codebook
Project 1 (SAQxPhone)	An effort to interview SAQ non-responders via telephone interview resulted in extra SAQ data for 365 M2 respondents.	Study Documentation	Download Full Dataset	

Project 1 (Coded Text)	Responses to open-ended variables for the MIDUS 2 phone interview and SAQ were coded and are available here.	Study Documentation	Download Full Dataset	Download PDF Codebook
Project 1 (SAQxPhone)	An effort to interview SAQ non-responders via telephone interview resulted in extra SAQ data for 365 M2 respondents.	Study Documentation	Download Full Dataset	Codebook
Project 2 (Daily Diary)	M2 Project 2 provided follow-up on the daily diary study included in MIDUS 1.	Study Documentation	Download Full Dataset	Download PDF

		Documentation	variables	Dataset	Codebook
Project 1 (SAQxPhone)	An effort to interview SAQ non-responders via telephone interview resulted in extra SAQ data for 365 M2 respondents.	Study Documentation		Download Full Dataset	
Project 2 (Daily Diary)	M2 Project 2 provided follow-up on the daily diary study included in MIDUS 1.	Study Documentation	Browse Variables	Download Full Dataset	Download PDF

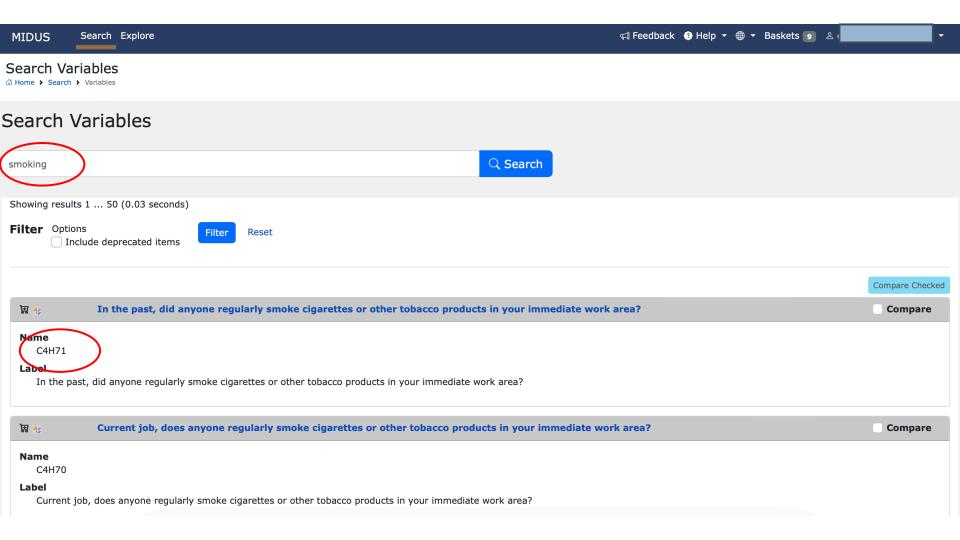
Project 1 (SAQxPhone)	An effort to interview SAQ non-responders via telephone interview resulted in extra SAQ data for 365 M2 respondents.	Study		Download Full	
		Documentation		Dataset	
Project 2 (Daily Diary)	M2 Project 2 provided follow-up on the daily diary study included in MIDUS 1.	Study	Browse	Download Full	Download
		Documentation	Variables	Dataset	PDF
			<b>\</b>		C- 4-1

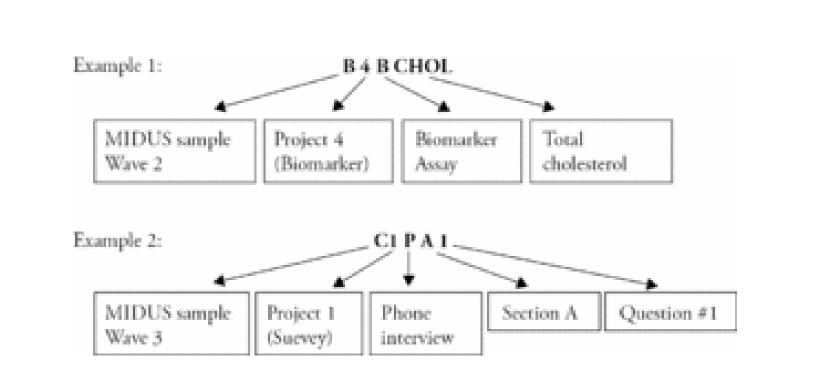
Troject I (SAQXI Holle)	All chort to interview sag non responders via telephone interview resulted in extra sag data for sos his respondents.	Study		Download I dil	
		Documentation		Dataset	
Project 2 (Daily Diary)	M2 Project 2 provided follow-up on the daily diary study included in MIDUS 1.	Study	Browse	Download Full	Download
		Documentation	Variables	Dataset	PDF
		•			Codebook

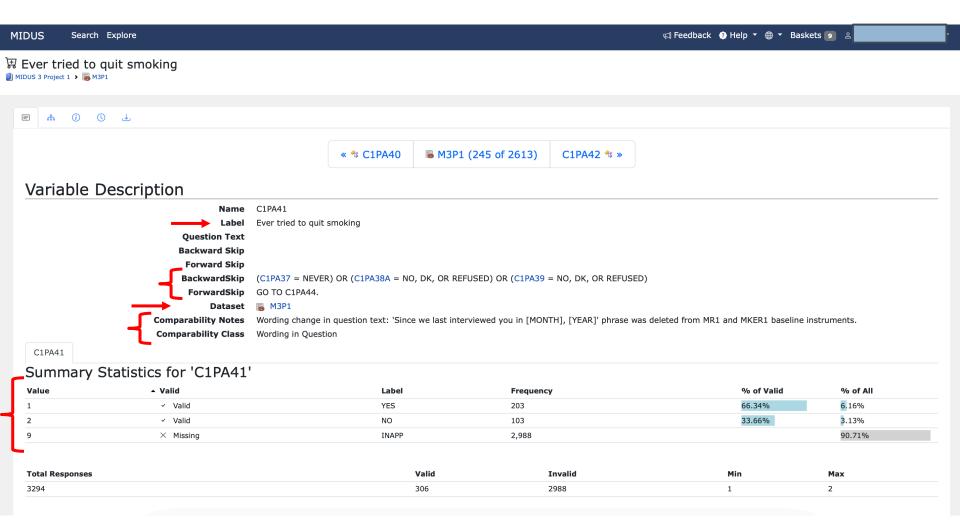
roject 2 (Daily Diary)	M2 Project 2 provided follow-up on the daily diary study included in MIDUS 1.	Study	Browse	Download Full	Downlo
		Documentation	Variables	Dataset	PDF
					Codebo

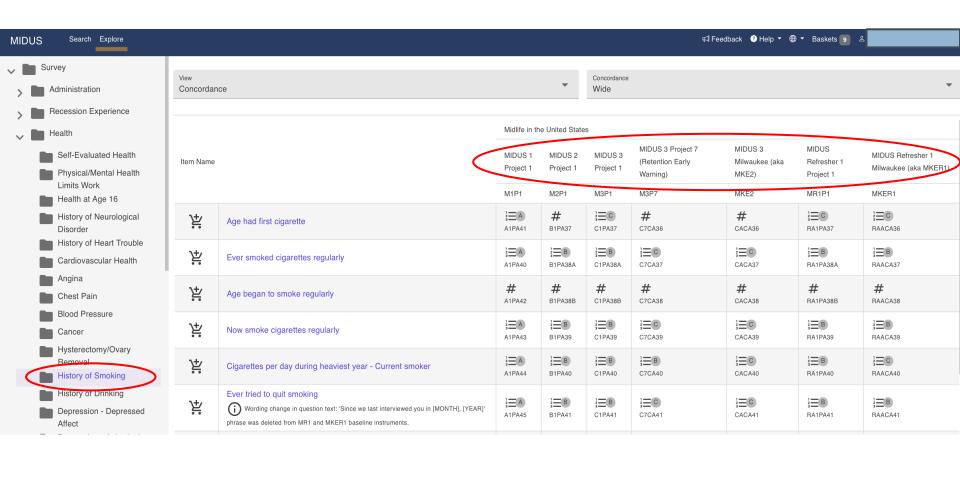
roject 2 (Dally Diary)	M2 Project 2 provided follow-up on the daily diary study included in MIDOS 1.	Study	Browse	pownioad Full	Download
		Documentation	Variables	Dataset	PDF Codebool

		Documentation Variables	Dataset PDF Codebook
Project 3 (Cognitive)	M2 Project 3 added new phone-based cognitive assessments for the full M2 sample.	Study Browse Do	ownload Full Download









### Lived with smoker growing up - Mother

MIDUS Data Element Concepts
 Survey
 Health
 History of Smoking



### Conceptual Variable

P1\_ConceptualVariable\_267

Lived with smoker growing up - Mother Label

**Comparability Notes** Not in M1, M3, and MKE2; was introduced at M2, MKE1, MR1, MKER1 as a new baseline item.

Comparability Class General Item Availability; Baseline Item

Code Comparison Correspondence Tree

% of valid % of total

Midlie in the United States

	MIDUS 2 Project 1	MIDUS 3 Project 7 (Retention Early Warning)	MIDUS Refresher 1 Project 1	MIDUS Refresher 1 Milwaukee (aka MKER1)			
	M2P1	M3P7	MR1P1	MKER1			
	B1PA45B	C7CA45B	RA1PA45B	RAACA45B			
	31.59%	38.92%	34.77%	43.98%			
	40.54%	33.69%	31.33%	29.19%			
\	27.86%	27.38%	33.90%	26.82%			

NO ONE DON'T KNOW

Item Name YES NO

REFUSED

Statistics

INAPP

Dataset	Variable	Valid	Invalid	Min	First Quartile	Median	Third Quartile	Max	Mean	StdDev
M2P1	B1PA45B	4,960	3	1				4		
МЗР7	C7CA45B	650	1	1				4		
MRP1	RA1PA45B	3,575	2	1				4		
MKER	RAACA45B	507	1	1				4		

### Age last smoked regularly MIDUS Data Element Concepts Survey Health History of Smoking

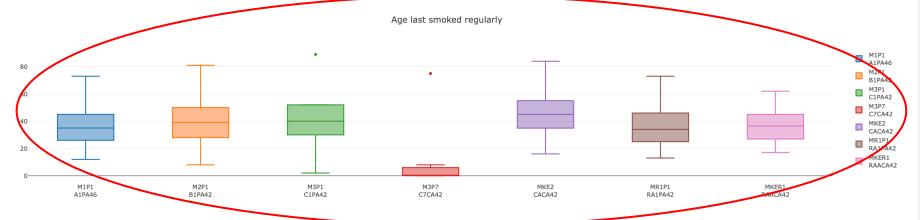


### Conceptual Variable

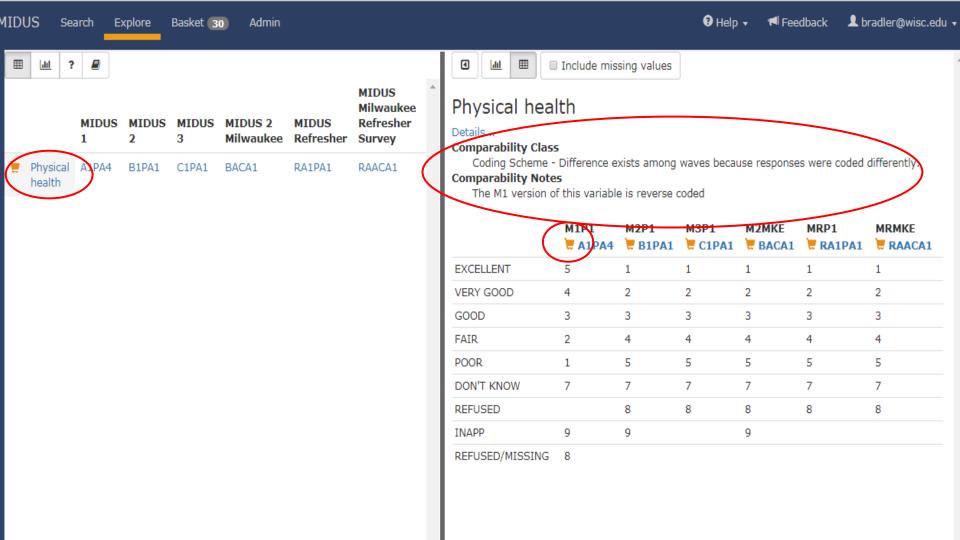
Name P1\_ConceptualVariable\_263 Label

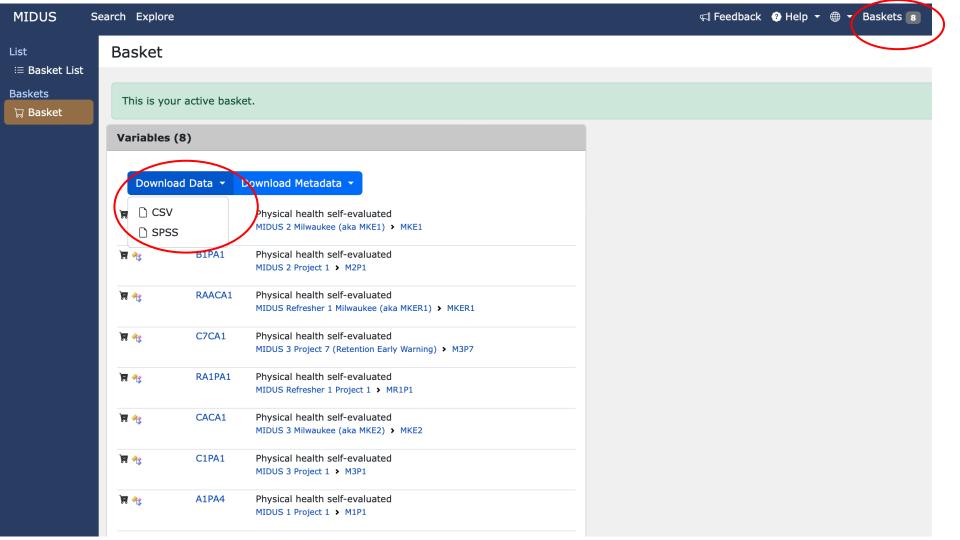
Age last smoked regularly



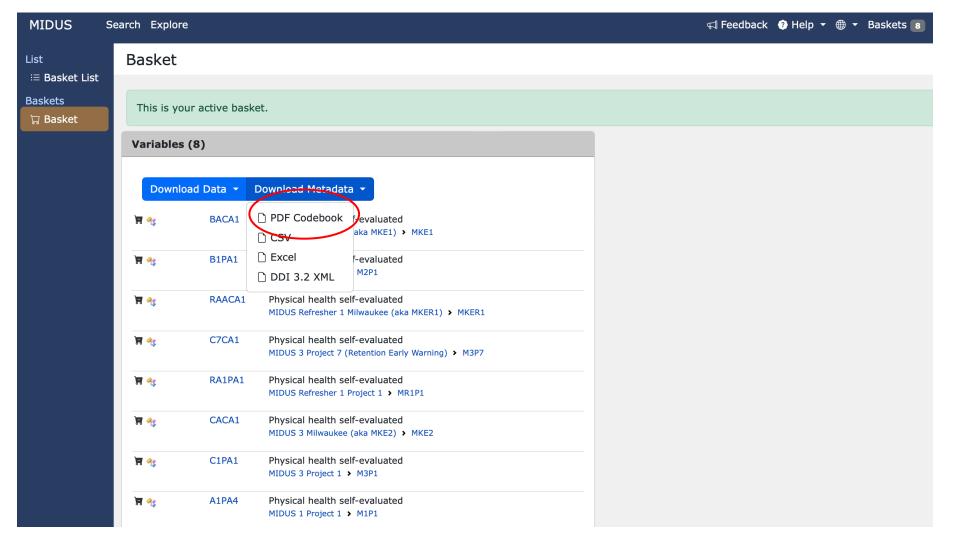


Dataset	Variable	Valid	Invalid	Min	First Quartile	Median	Third Quartile	Max	Mean	StdDev
M1P1	A1PA46	2,033	5,075	12	26	35	45	73	36.5	12.59
M2P1	B1PA42	1,632	3,331	8	28	39	50	81	39.31	13.52





DEMO1.sav [NIA_Example] - IBM SPSS Statistics Data Editor						
<u>F</u> ile <u>E</u> dit	<u>V</u> iew <u>D</u> ata <u>T</u> ra	ansform <u>A</u> nalyze <u>G</u> raphs <u>U</u> tilities E <u>x</u> tensions <u>W</u> indow	<u>H</u> elp			
				ABG		
	Name	Label	Values	Missing		
1	MIDUSID	Master ID created by concatenating M2ID, MRID, MIDJA_IDs	None	None		
2	SAMPLMAJ	Major sample identification (aka Sample)	{1, MAIN RDD}	None		
3	M2ID	MIDUS 2 ID number	None	None		
4	MRID	MIDUS Refresher ID number	None	None		
5	A1PA41	Age smoked first cigarette	{96, NEVER HAD A CIGARETTE}	97, 98, 99		
6	A1PA46	Age when last smoked regularly	None	97, 98, 99		
7	A1PAGE_M2	M1 age computed by subtracting Date of Birth from M1 intervi	None	98		
8	A1PRSEX	Gender of respondent	{1, MALE}	None		
9	A1PA4	Physical health	{1, POOR}	7, 8, 9		
10	B1PA37	Age had first cigarette	None	96, 97, 98		
11	B1PA42	Age last smoked regularly	None	97, 98, 99		
12	B1PAGE_M2	Age determined by subtracting DOB_Final from b1ipidate	None	98, 99		
13	B1PRSEX	Respondent gender	{1, MALE}	None		
14	B1PA1	Physical health self-evaluated	{1, EXCELLENT}	7, 8, 9		
15	BACA36	Age had first cigarette	{96, NEVER HAD A CIGARETTE}	97, 98, 99		
16	BACA42	Age last smoked regularly	None	97, 98, 99		
17	BACRAGE	Respondent age (interview date minus DOB)	None	None		
18	BACRSEX	Respondent gender	{1, Male}	None		
19	BACA1	Physical health self-evaluated	{1, EXCELLENT}	7, 8, 9		
20	C4DA27	A bd E:	MC NEVER HAD A CICARETTE	07 00 07		



### **DEMO NIA\_Example**

Generated on Thursday, September 21, 2017 2:22 PM

#### Data File

MIDUSID

Label

Master ID created by concatenating M2ID, MRID, MIDJA\_IDs

Representation

Type

Numeric

Role

input

Dataset

MIDUSID\_SampleID\_20160526.sav

Valid	Invalid	Minimum	Maximum
13225	0	10001	39999

#### SAMPLMAJ

Label

Major sample identification (aka Sample)

Representation

Role

input

Dataset

MIDUSID\_SampleID\_20160526.sav

_	/		
Value	Label	Frequency	%
1	MAIN RDD	3,487	26.4%
2	SIBLING	952	7.2%
3	TWIN	1,996	15.1%
4	CITY OVERSAMPLE	757	5.7%

4086 9139 30000 399	9
---------------------	---

MIDJA IDs

Label

Midlife in Japan ID number

Representation

Type

Numeric

Role input

Dataset

MIDUSID\_SampleID\_20160526.sav

Maximum	Minimum	Invalid	Valid	
29987	20008	12198	1027	

Label

Age had first cigarette

Representation

Forward Skip

IF BACA36 = 96, GO TO BACA44.

Interviewer Instructions

INTERVIEWER: IF R SAYS "I don't smoke", PROBE: "At what age did you have your very FIRST cigarette, if EVER?"

Ouestion Text

At what age did you have your very first cigarette?

Pre-Question Text

The next questions are about smoking cigarettes.

Dataset

M2ID\_MILWAUKEE\_DATA WITH 19 NEW SAQS\_N=592\_3-29-12.Sav

ICPSR DOI for Project

http://dx.doi.org/10.3886/ICPSR22840

Value	Label	Frequency	%
96	NEVER HAD A CIGARETTE	123	20.8%

### **Future Directions**

- DDI is question, survey-centric
  - Expand capabilities for non-survey data collection
  - Bake DDI details into biomarker, laboratory, and derived variables
- Integrate MIDUS Colectica Portal with ICPSR
  - Encourage ICPSR to employ DDI 3.2
- Explore harmonization with other DDI-compliant studies



# Citation Acknowledgment for MIDUS Publications

- □ Since 1995 the MIDUS study has been funded by the following:
  John D. and Catherine T. MacArthur Foundation Research Network
  National Institute on Aging (P01-AG020166)
  National institute on Aging (U19-AG051426)
- For Biomarker Data:

1UL1RR025011 (UW)

Biomarker data collection was further supported by the NIH National Center for Advancing Translational Sciences (NCATS) Clinical and Translational Science Award (CTSA) program as follows: UL1TR001409 (Georgetown) UL1TR001881 (UCLA)





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