

The National Longitudinal Study of Adolescent to Adult Health (Add Health)

Presented to the National Advisory Child Health and Human Development Council
National Institutes of Health

January 26, 2026

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Outline of Talk

1) Brief Add Health History, Motivations, & Evolution

2) Add Health Grows Up: Wave VI Goals, Design, and Data Collection

3) Glimpse of Descriptive Data from Wave VI of Add Health

4) Accessing Add Health Data

5) Acknowledgements

1) Brief Add Health History & Evolution

Add Health Origins & Evolution

Developed in response to a 1993 Congressional mandate

Originally two waves (Waves I and II); evolved into multi-wave design in early 2000s

Originally the National Longitudinal Study of Adolescent Health; renamed the National Longitudinal Study of Adolescent **to Adult** Health with Wave V in 2014

NICHD primary funder from 1993 through 2020

Most recently (2021-25), Wave VI funded by NIA and five co-funding institutes & offices (NICHD, NIMHD, NIDA, OBSSR, ODP)

Innovative Original Design

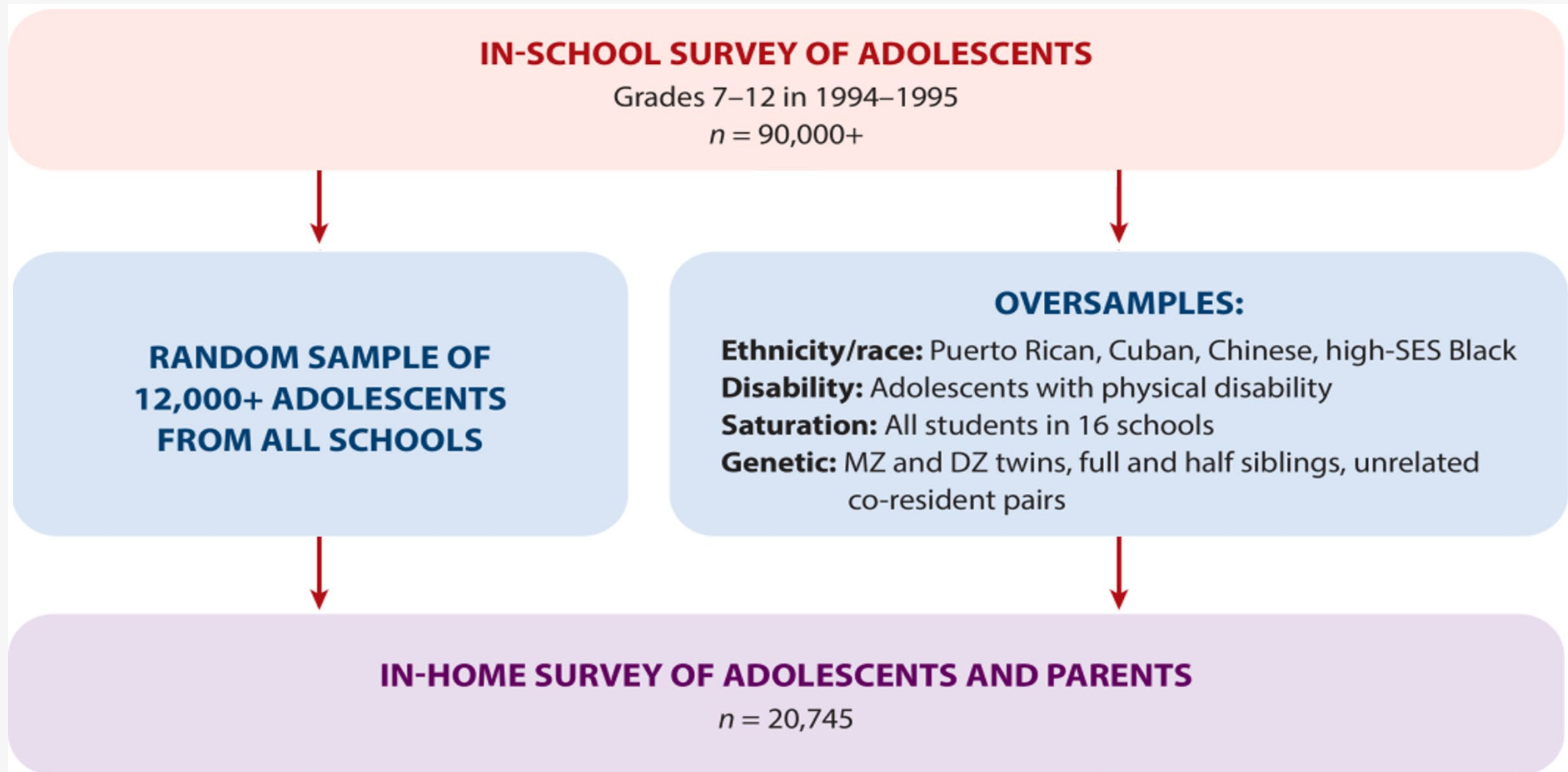
Foundational attention to:

- Life course principles
- Health disparities
- Social contexts
- Biological processes
- Population representativeness & heterogeneity
- Core attention to major health & social issues in the US

Recipient of 2016 Golden Goose Award →



Add Health Wave I Sample Design



Add Health Substantive Motivations

Adolescent Behavior & AIDS Epidemic

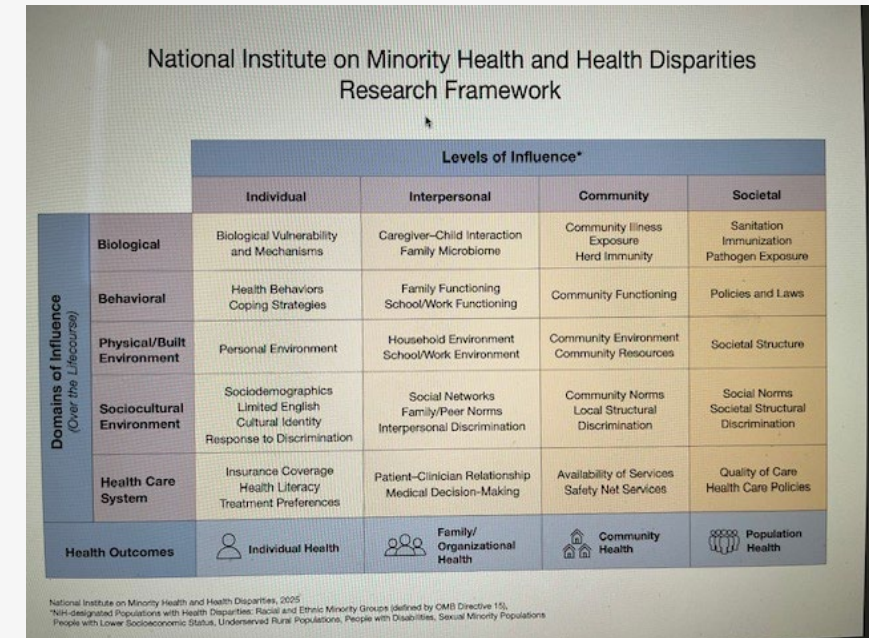
Stubborn and in some cases widening health & well-being disparities

Relationships & Family Formation

Obesity Epidemic

Midlife Health & Mortality

Risk & Resilience for Cognitive & Physical Functioning



Add Health Longitudinal, Multi-level, Intergenerational Design

(Each wave also includes contextual and environmental data specific to various geographic levels)

Wave	Administrative	Survey Administration		Biological Data Collection		Cognitive Assessments
Wave I 1994-95	Students N = 90,118 School Admin N = 144	Adolescents in Grades 7-12 N = 20,745	Parent N=17,670		Height, weight	Self-Reported GPA and Intelligence, Picture Vocabulary Test
Wave II 1996	School Admin N = 128	Adolescents in Grades 8-12 N = 14,738			Height, weight	Self-Reported GPA and Intelligence, Picture Vocabulary Test
Wave III 2001-02	High School Transcripts	Young adults Aged 18-26 N = 15,197	Partner N=1,507		Height, weight, STI, HIV, genetic (buccal cell DNA)	High School Transcripts: Grades & Coursework
Wave IV 2008-09		Adults Aged 24-32 N = 15,701			Height, weight, waist, metabolic, immune, inflammation, cardiovascular, medications, candidate genes, GWAS	Number & Word Recall Tests
Wave V 2016-18	Birth & Death Records	Adults Aged 33-43 N = 12,300	Parent N=3,000	Sexual Orientation & Health N=2,665	Height, weight, waist, metabolic, immune, inflammation, cardiovascular, renal, medications, gene expression, epigenetic, microbiome	Number & Word Recall Tests
Wave VI 2022-25	Birth & Death Records; College Records	Adults Aged 39-51 N=11,979	Parent N~5,000		Height, weight, waist, metabolic, immune, inflammation, cardiovascular, renal, medications, microbiome, physical & sensory functioning, neurocognitive	Number & Word Recall + Full Add CAPS Battery

Just a Few Areas in which Add Health-Based Papers Have Made Key Scientific Contributions Over the Years

Effects of Friendship Networks,
Family Involvement, and
Neighborhood Contexts on
Adolescent & Young Adult Health

Emergence, Trajectories of, and
Explanations for, Health Disparities

Tracking the Obesity Epidemic &
Emerging Cardiovascular Health Risks

Disentangling genetic & social
factors shaping adult health &
health behavior

Understanding of incarceration for
adult health & aging

Describing and modeling cognition
& disparities therein during young
adulthood & early midlife

2) Add Health Grows Up: Wave VI Goals, Design, and Data Collection

Goals for Add Health Wave VI

(Average age = 44)

Collect & disseminate high-quality data on life course determinants and trajectories of health, cognition, health behavior, and health disparities among a large, nationally representative cohort aging into midlife.

- Substantial attention to racial/ethnic and socioeconomic heterogeneity of sample
- Substantial attention to ‘pulls and tugs’ of early midlife
- Substantial attention to quality control in data production & dissemination
- Substantial attention to confidentiality and protection of Add Health participants

Context for Nationally Representative Add Health Data Collection in 2022-25

Declining response rates

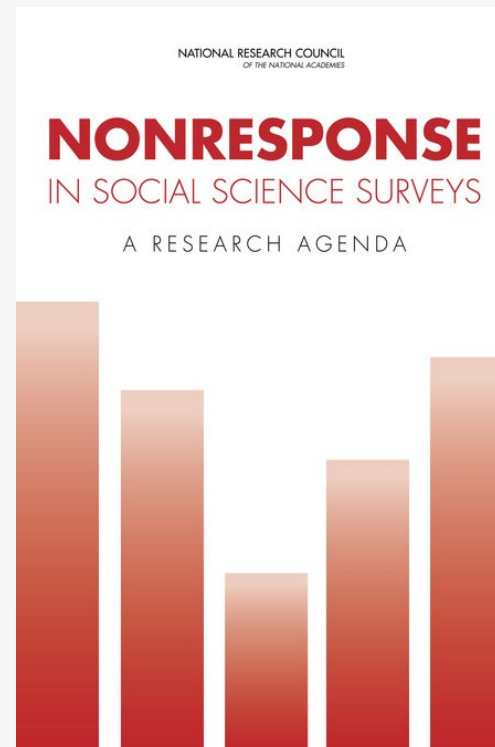
Declining trust in institutions

Competition for survey attention

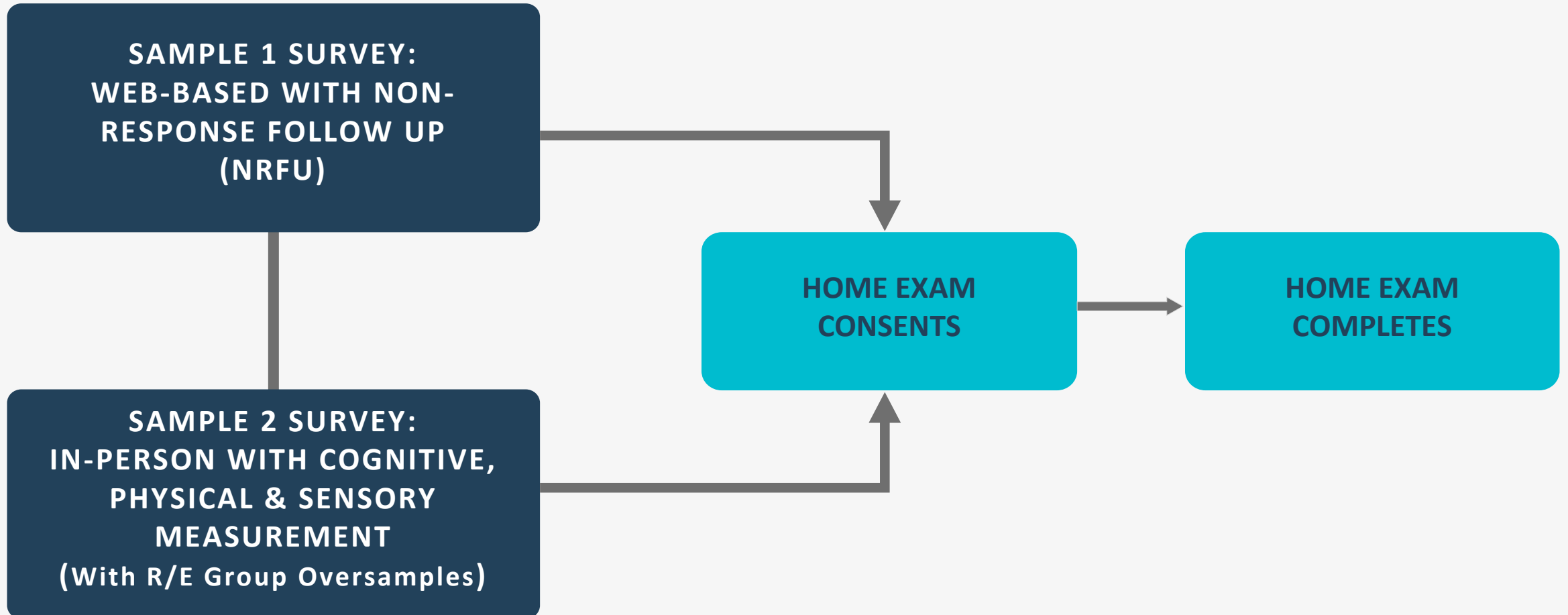
Average age of 44: they are busy!!!

Longer, complex instruments

Last collected data in 2016-18



Wave VI Two Sample + Home Exam Design

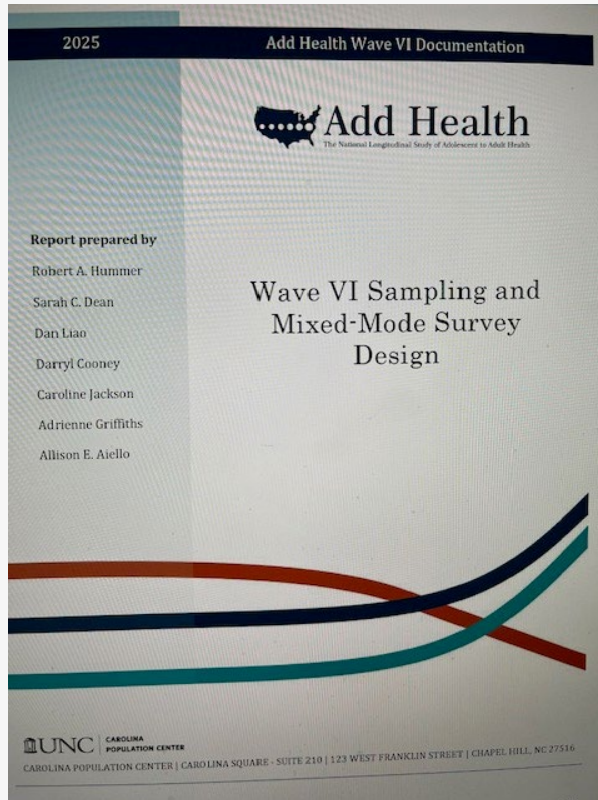


Final Data on Wave VI Completes, with Comparison to Wave V

	Sample 1	Sample 2	Wave VI Totals	Wave V
Survey Completes	9,366	2,613	11,979	12,300
Home Exam Completes		–	6,073	5,381

3. A Brief Peek at Data from Wave VI

Wave VI Survey Data



Let's take a look...



Survey Data Sections Across Waves

Waves I, II

Demographic
Family, sibs, friends
Education, work
Physical & mental health
Health Behaviors & Care
Relationships
Sexual & fertility histories
Delinquency and violence
Attitudes, religion
Economics, expectations
Psychological, personality
Cognitive

Wave III

Demographic
Family, sibs, friends
Education, work, **military**
Physical & mental health
Health Behaviors & Care
Relationships
Sexual & fertility histories
Involvement w/criminal justice sys
Attitudes, religion
Economics, expectations
Psychological, personality
Cognitive
Children and parenting
Civic participation
Gambling
Mentoring

Wave IV

Demographic
Family, sibs, friends
Education, work, military
Physical & mental health
Health Behaviors & Care
Relationships
Sexual, & fertility histories
Involvement w/criminal justice sys
Work attitudes and chars
Attitudes, religion
Economics, expectations
Children and parenting
Civic participation
Personality
Psychosocial factors
Stressors
Cognitive function

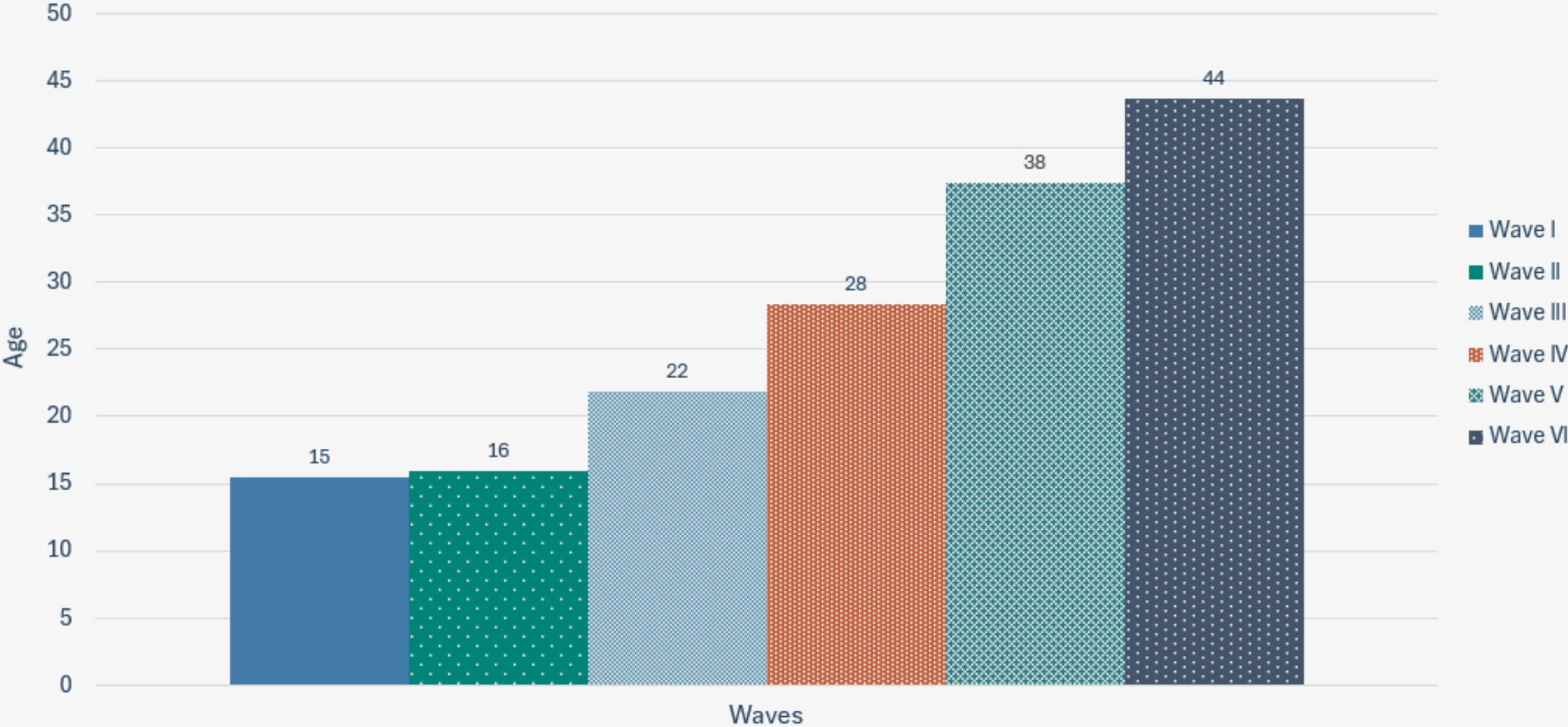
Wave V

Demographic
Family, sibs, friends
Education, work, military
Physical & mental health
Health Behaviors & Care
Relationships
Sexual & fertility histories
Involvement w/criminal justice sys
Work attitudes and chars
Attitudes, religion
Economics, expectations
Children and parenting
Civic participation
Personality
Psychosocial factors
Stressors
Cognitive function
Retrospective child health & SES

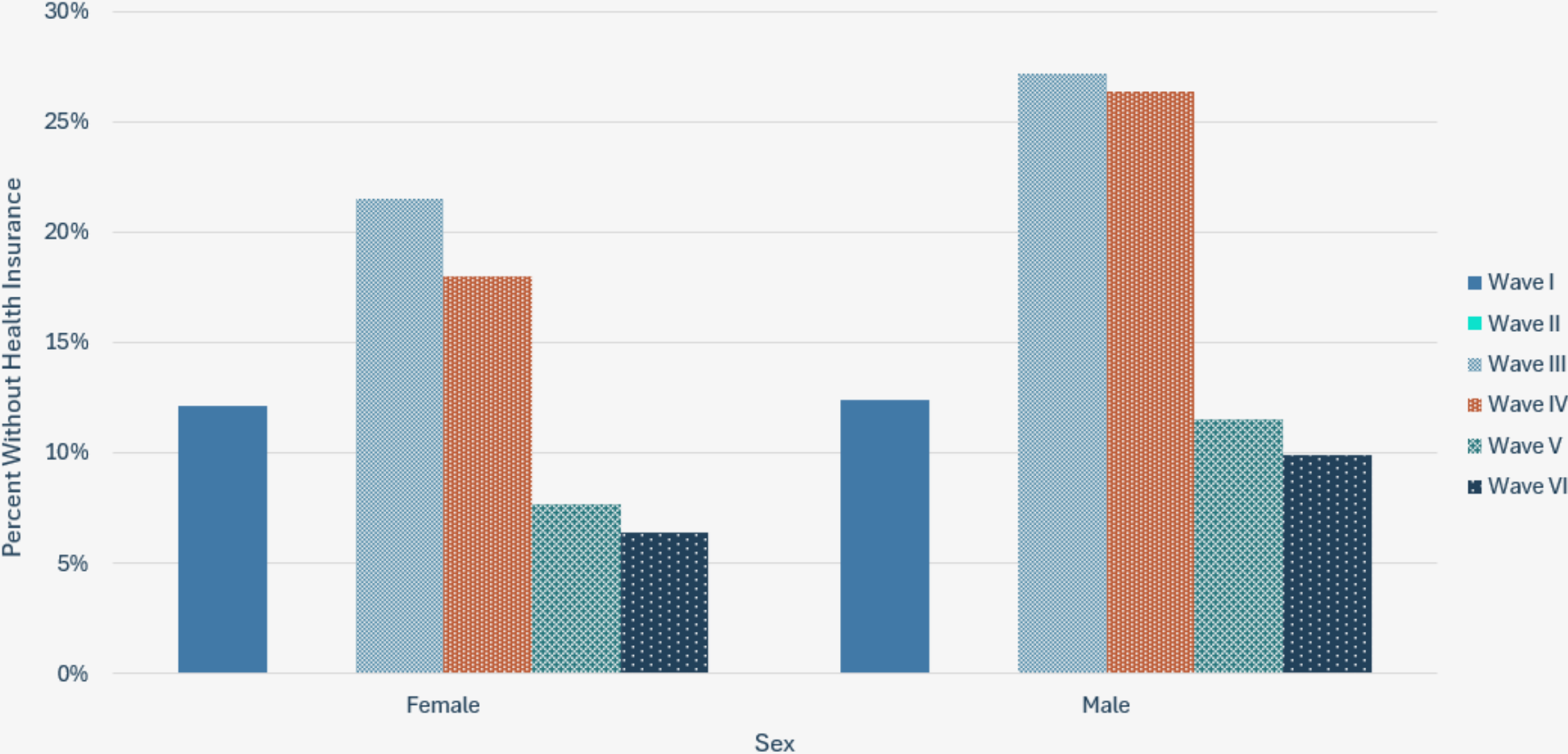
Wave VI

Demographic
Family, sibs, friends
Education, work, **work-life balance**,
military
Physical & mental health (**many additions**)
Health behaviors & care
Relationships
Sexual & fertility histories
Involvement w/criminal justice system
Work attitudes & characteristics
Attitudes, religion
Economics, children & parenting
Civic participation
Personality
Psychosocial factors
Stressors (**Anticipatory & Cumulative**)
Caregiving
Institutional trust
Neighborhood Perceptions
Discrimination
Physical & Sensory Function
Cognitive function (**Test My Brain**)

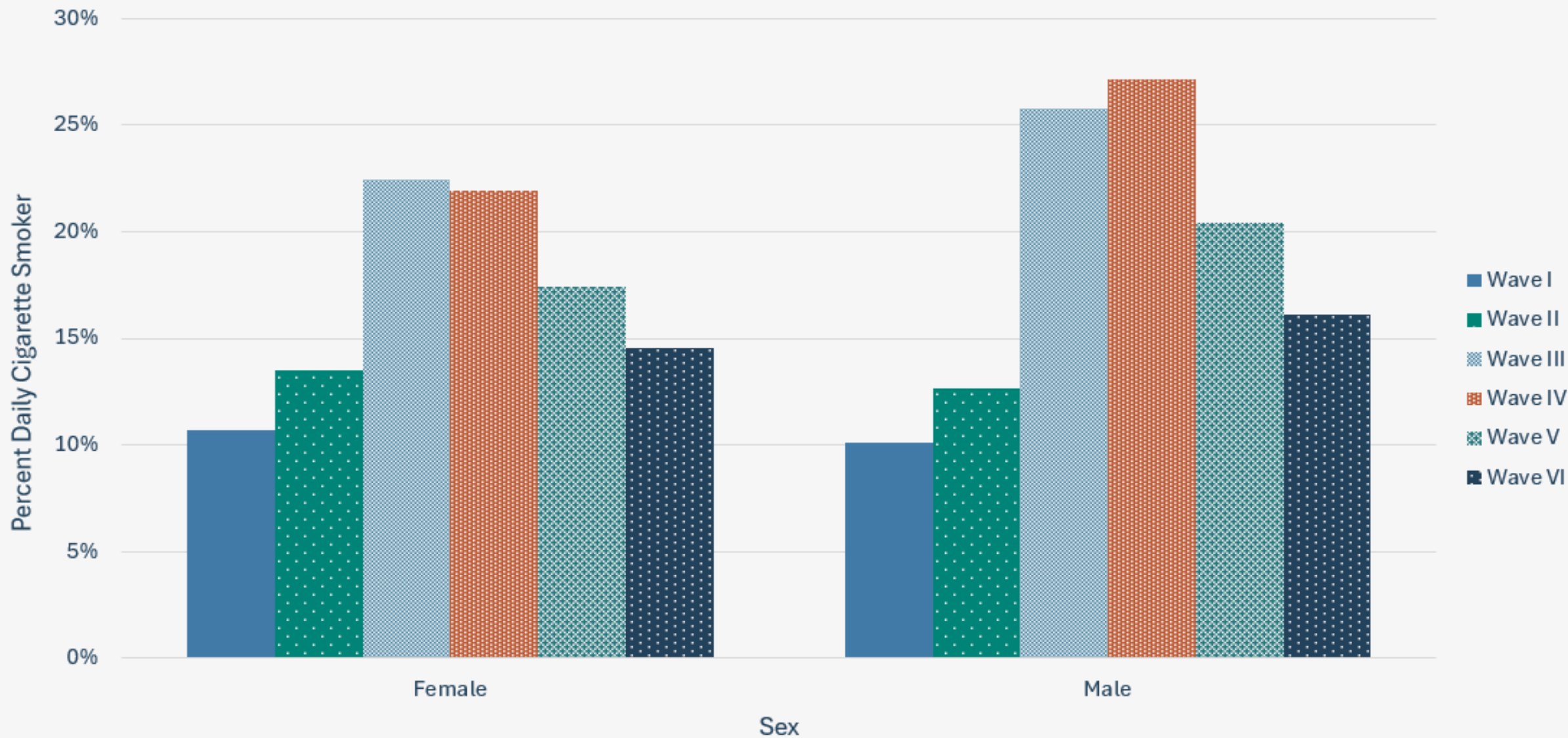
Average Age of Participants Across Waves



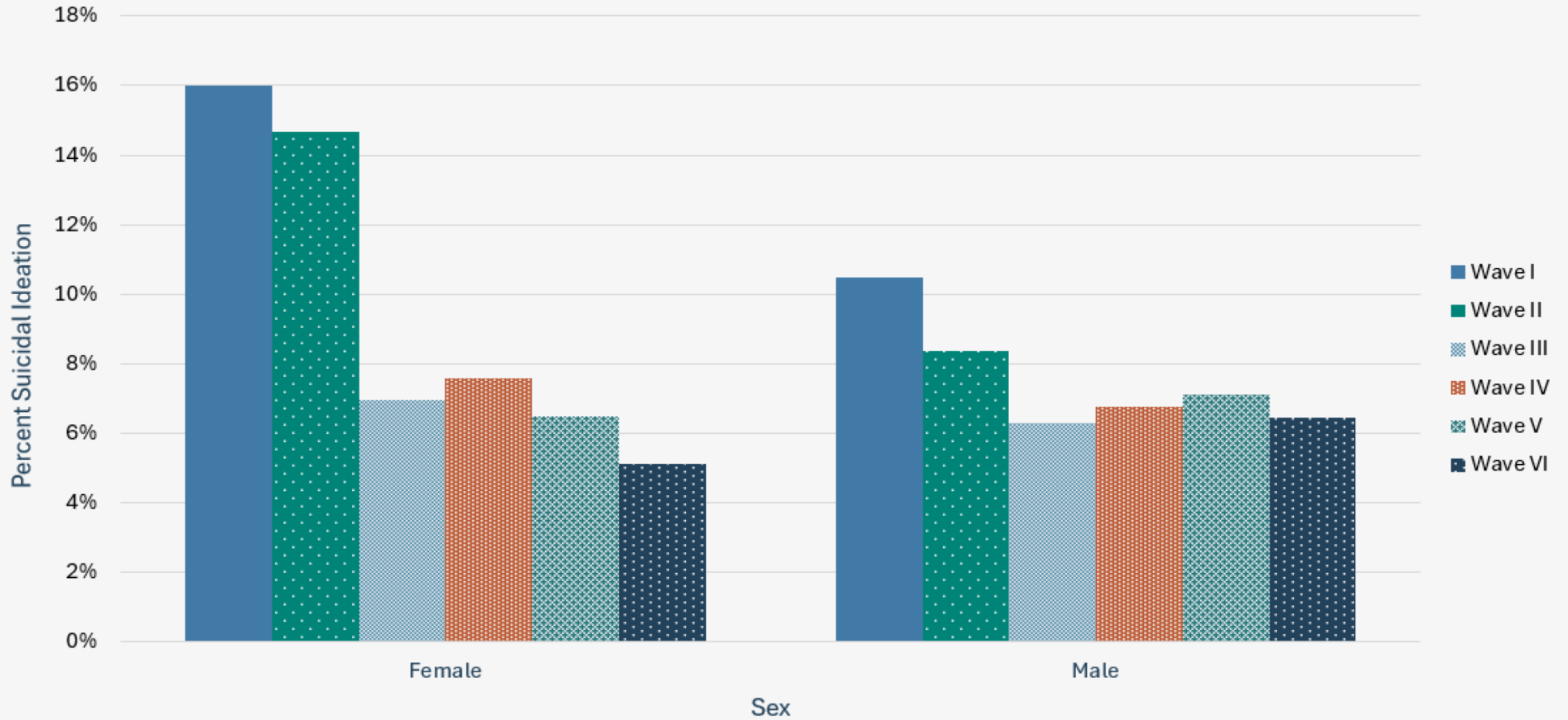
Weighted Percent Without Health Insurance by Sex Across Waves



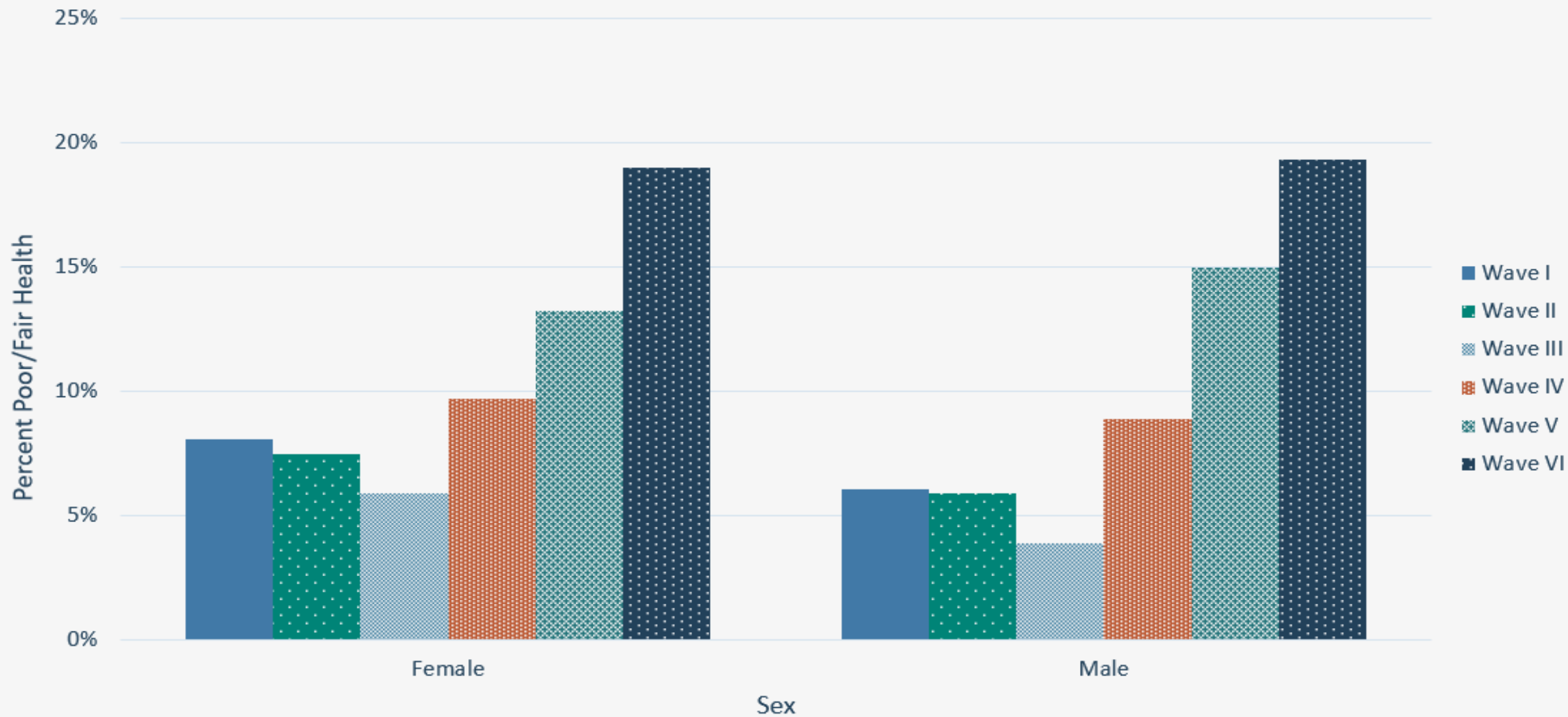
Weighted Daily Cigarette Smoking by Sex Across Waves



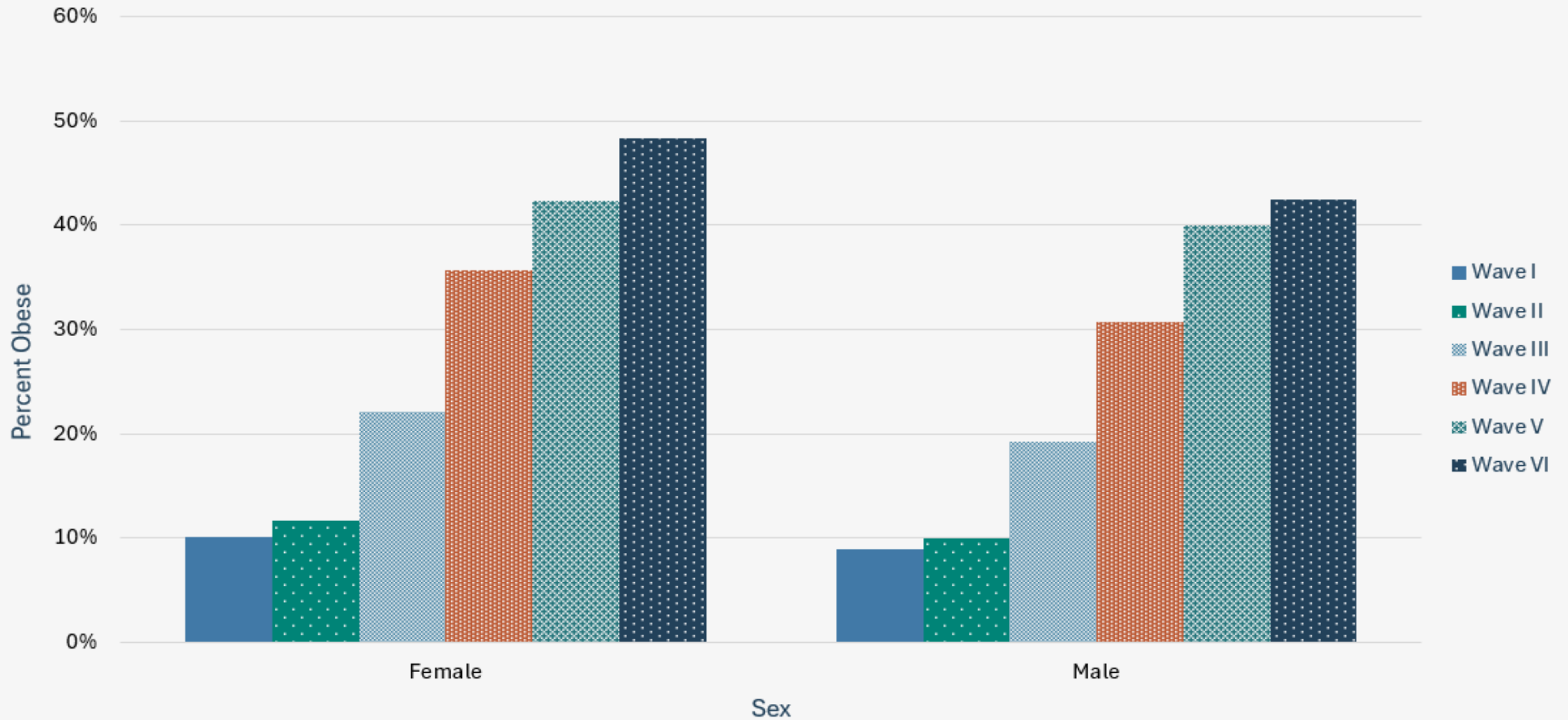
Weighted Self-Reported Suicidal Ideation by Sex Across Waves



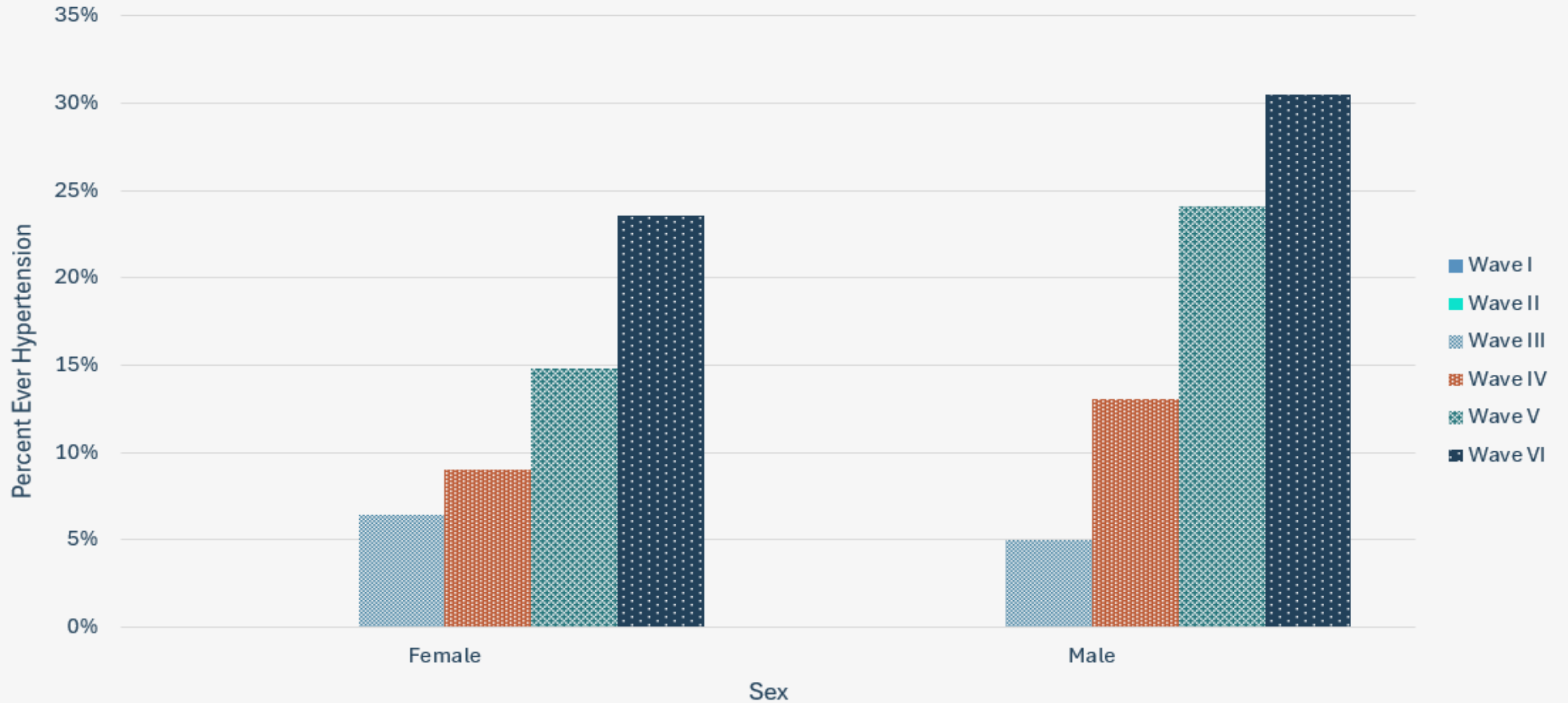
Weighted Percent of Poor/Fair Health by Sex Across Waves



Weighted Self-Reported Height & Weight (Obesity) by Sex Across Waves



Weighted Self-Reported Hypertension by Sex Across Waves

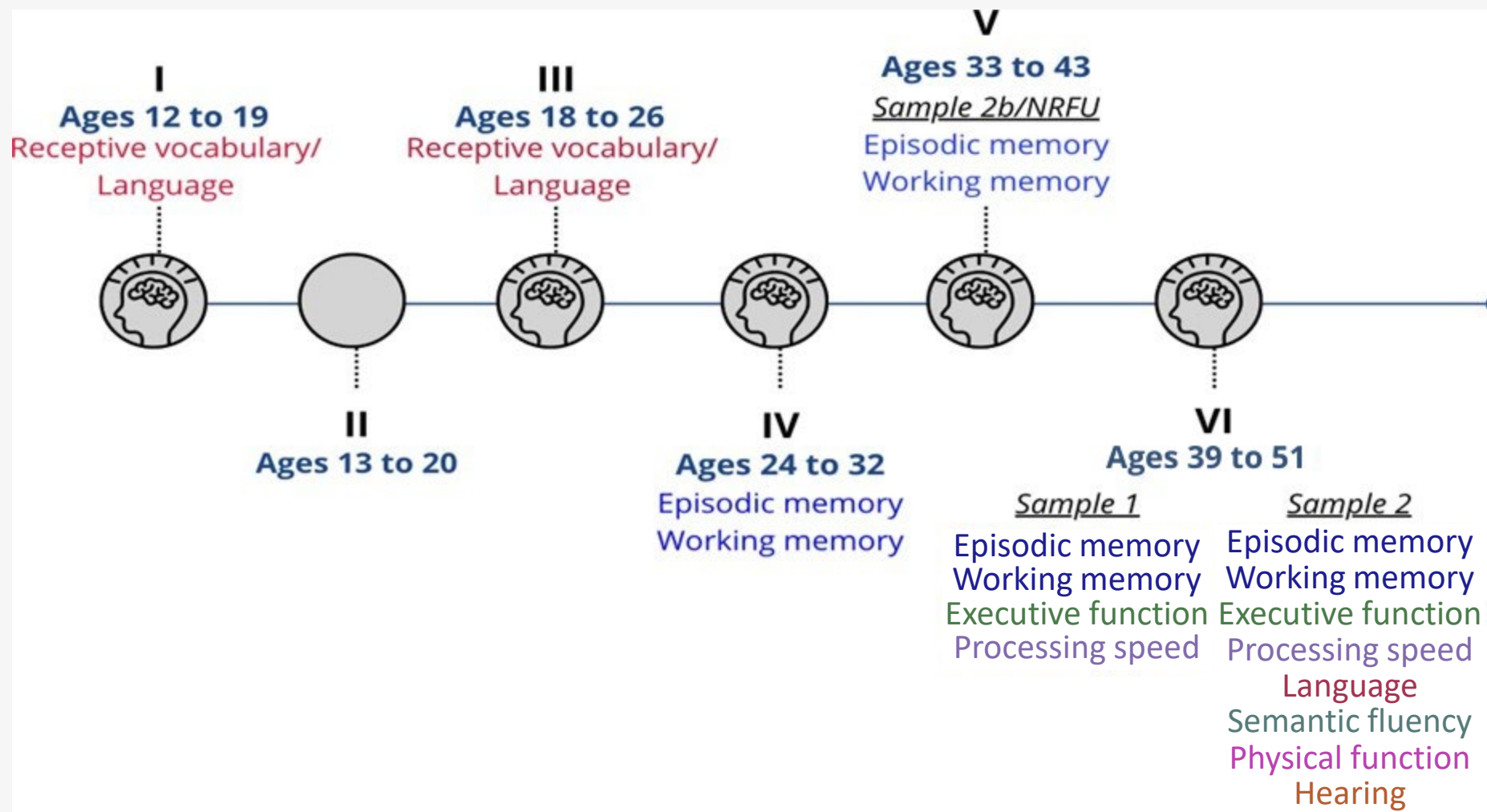


Wave VI Measures of Cognitive, Sensory & Physical Functioning

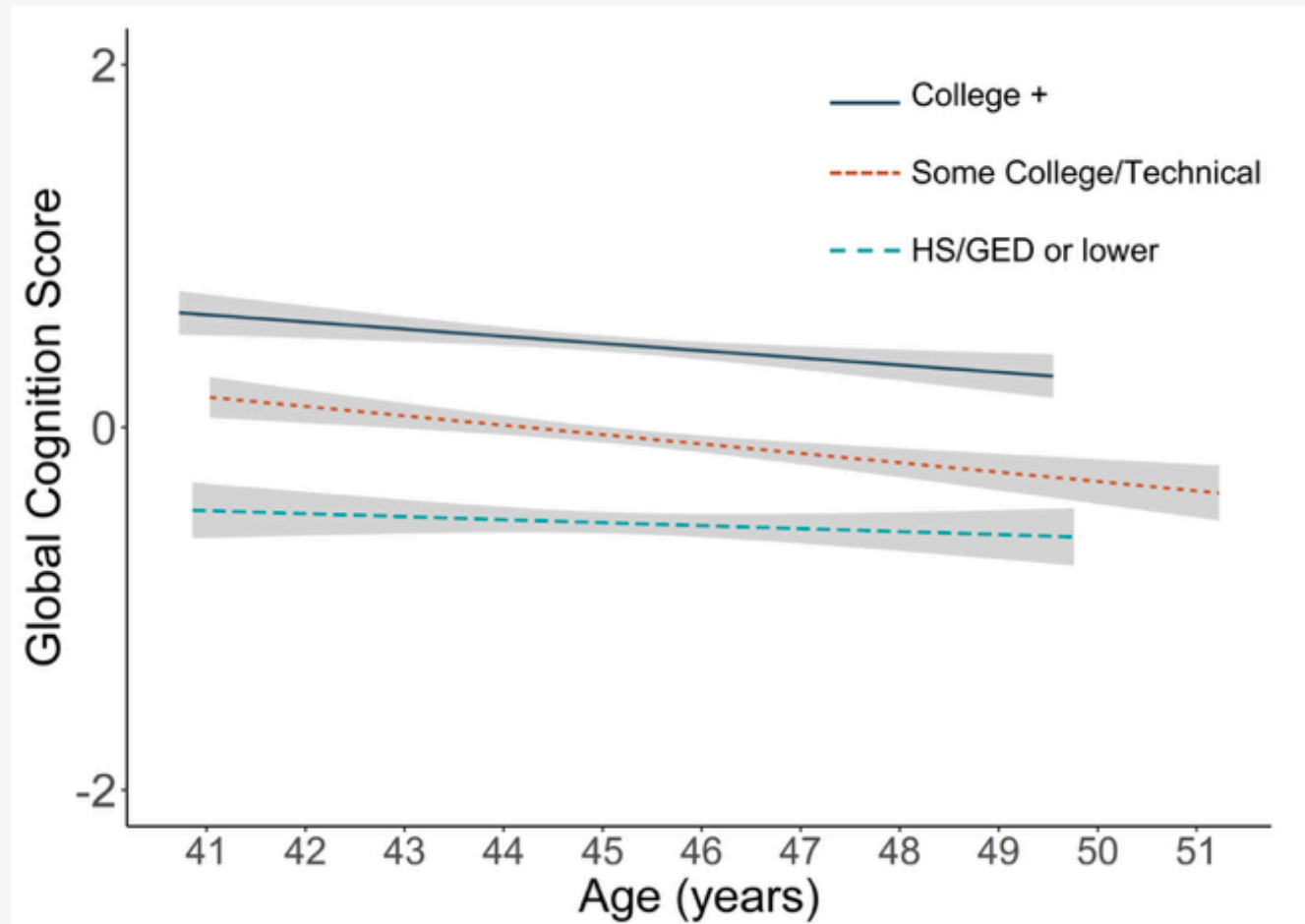
Add Health Cognitive Assessment, Physical, and Sensory Functioning (Add CAPS) Protocol



Cognitive domains in previous waves and Add CAPS domains in Wave VI of Add Health



Global Cognition Z-Scores in Wave VI of Add Health, by Age and Educational Attainment



Wave VI Home Examination Data

Add Health Biological & Clinical Content, Waves I–VI

Domains	Waves I, II (ages 12-20)	Wave III (ages 18-26)	Wave IV (ages 24-32)	Wave V (ages 33-43)	Wave VI (ages 39-51)
Anthropometric	✓	✓	✓	✓	✓
Omics		✓	✓	✓	✓
Immune/Infectious		✓	✓	✓	✓
Cardiovascular			✓	✓	✓
Metabolic			✓	✓	✓
Medications			✓	✓	✓
Renal/ Liver				✓	✓
Microbiome				✓	✓
Neurocognitive					✓

Wave VI Home Exam Data Sets (N = 6,073)

Anthropometric
Cardiovascular Measures
Baroreflex Sensitivity
Neurodegeneration Biomarkers
Glucose Homeostasis
Lipids
Renal
Hepatic Injury
Inflammation and Immune Function
Infection
Biomarker Weights
Home Exam Questionnaire and Medications

Wave VI Add Health BMI Data: Comparison of Self-Reports vs Measured

	Percent BMI >30	
	<u>Female</u>	<u>Male</u>
Self-Reported Height and Weight	49%	42%
Measured Height and Weight	52%	46%

Wave VI Add Health Hypertension Data: Comparison of Self-Reports vs Measured

	Percent Hypertension	
	<u>Female</u>	<u>Male</u>
Self-Reported	24%	30%
Using Medication	22%	20%
Stage 1 Measured	29%	35%
Stage 2 Measured	17%	29%
Joint Classification (AHA/ACC)	56%	71%

Contextual and Environmental Data

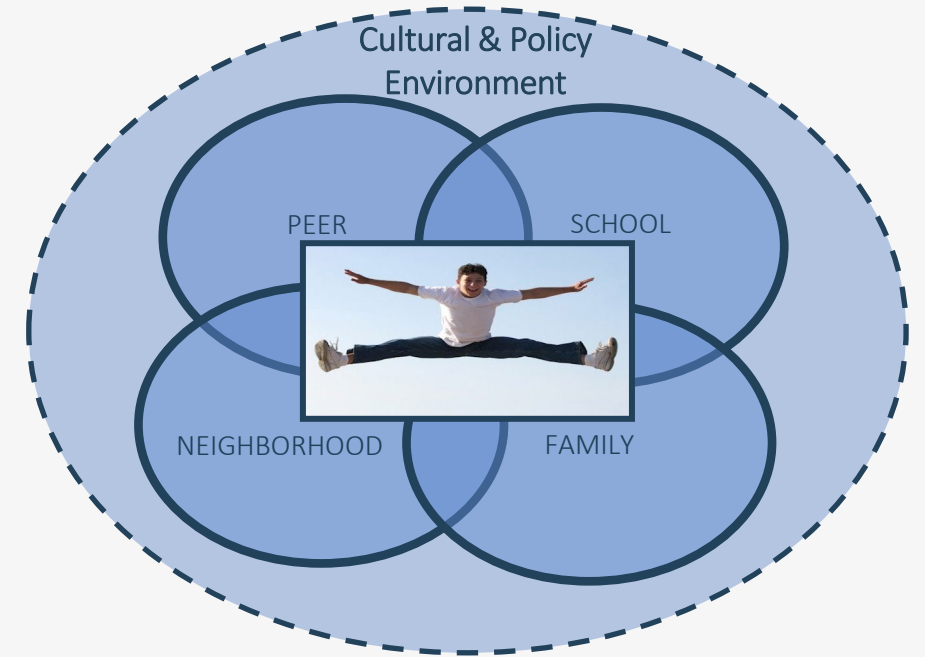
Core Emphasis in Add Health Since Wave I →

Thousands of Available Variables

- Social, economic, health, commercial, policy, etc.
- Schools, neighborhoods, counties, states, etc.
- Searchable tool for users

Wave VI Exposome Supplement

- Social Structure (Neighborhoods, Cities, Counties, States)
- Environmental (Pollutants, Noise, Water, etc.)
- All being linked to Wave I to Wave VI participant home addresses



Wave VI Administrative Data

Decedent Records (N=769)



Birth Records (5 states so far)



College Educational Records (In Progress)



4. Accessing Add Health Data

Add Health Users

Restricted-Use Data

- Access requirement: Approved 5-year contract with UNC (renewable)
- ~400 current contracts, average 6 users apiece
- Many use our Secure Research Workspace (SRW); others use secure server at home institution
- Please visit the project website (<https://addhealth.cpc.unc.edu>) ... click on “Data”

Public-Use Data Through ICPSR or Data Verse

- Access requirement: Data use agreement
- ~50,000+ researchers over the years
- Most highly-utilized data set in ICPSR’s archive in recent years

5. Acknowledgements

Wave VI Acknowledgements

Wave VI of Add Health is supported by two cooperative agreements from the National Institute on Aging (1U01AG071448, principal investigator Robert A. Hummer, and 1U01AG071450, principal investigators Robert A. Hummer and Allison E. Aiello) to the University of North Carolina at Chapel Hill. Co-funding for Wave VI is being provided by the Eunice Kennedy Shriver National Institute of Child Health and Human Development, the National Institute on Minority Health and Health Disparities, the National Institute on Drug Abuse, the NIH Office of Behavioral and Social Science Research, and the NIH Office of Disease Prevention. Waves I-V data are from the Add Health Program Project, grant P01 HD31921 (Kathleen Mullan Harris) from the Eunice Kennedy Shriver National Institute of Child Health and Human Development, with cooperative funding from 23 other federal agencies and foundations. The content of this presentation is solely the responsibility of the author and does not necessarily represent the official views of the National Institutes of Health or the University of North Carolina at Chapel Hill.

Add Health was originally designed by J. Richard Udry, Peter S. Bearman, and Kathleen Mullan Harris at the University of North Carolina at Chapel Hill. Add Health is currently directed by Robert A. Hummer; it was previously directed by Kathleen Mullan Harris (2004-2021) and J. Richard Udry (1994-2004).

Wave VI Acknowledgements, continued

Staff: Sarah Dean, Caroline Jackson, Kathryn Carrier, Bob Angel, Tiffany Jensen, Anna Tortorici, Cherese Parker, Julie Kouzoukas, Jenna Gordon, Sarah Rodan, Vishali Muthuvinnayagam, Mary Jane Hill, Janne Groner, Lixin Qu, Tim Monbureau, John Knapp, Jason Grago, Michelle Lemon-Russell, Elyssa Trani, Brandt Levitt, Brian Frizzelle, Stephen Loo, Ian Hoyt-McCullough, Ed Van Duinen, Lynn Ngo, Farizah Rob

Research Scientists: Adrienne Griffiths, Rebecca Stebbins, Andrea Goodwin

Students: Fatima Touma, Athena Owirodu, Jenny Momkus, Annabelle Gallinek

NIA Project Officer & Project Scientists: Amelia Karraker, Janine Simmons, & Emily Hooker

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Deputy Director: Allison Aiello

Investigators: Eric Whitsel, Carolyn Halpern, Y. Claire Yang, Taylor Hargrove, Lauren Gaydos, Chantel Martin, Christy Avery, Kathleen Mullan Harris, Laura Loehr, Carmen Gutierrez

RTI International (PI: Brian Burke)

Laboratory for Clinical Biochemistry Research at University of Vermont (PI: Mary Cushman)

ExamOne: Home Exam Contractor

Wave VI Acknowledgements, continued

Add Health Participants

Extra Slides

Timeline of Selected Key Events During the Life Course of the Add Health Cohort

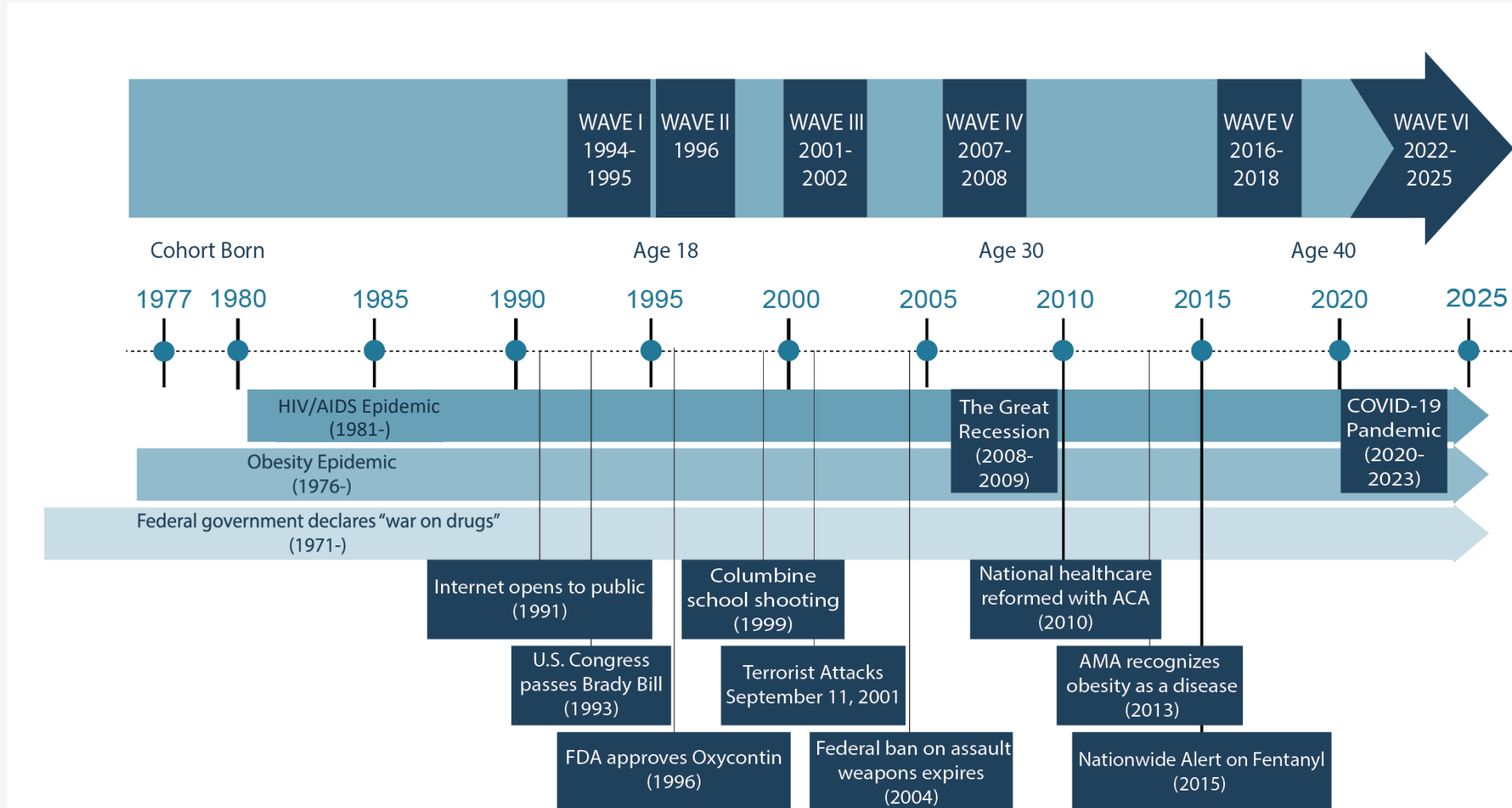


Figure taken from: Lawrence, E. M.; Trani, E. A.; Anthony, K. M.; Hummer, R. A.; Jensen, T.; Tuder, S.; Loehr, L. R.; Harris, K. M.; & Whitsel, E. A. (2024). Data Resource Profile: Add Health Mortality Outcomes Surveillance. *Int J Epidemiol.* vol. 53 (5), PMID: PMC11398900

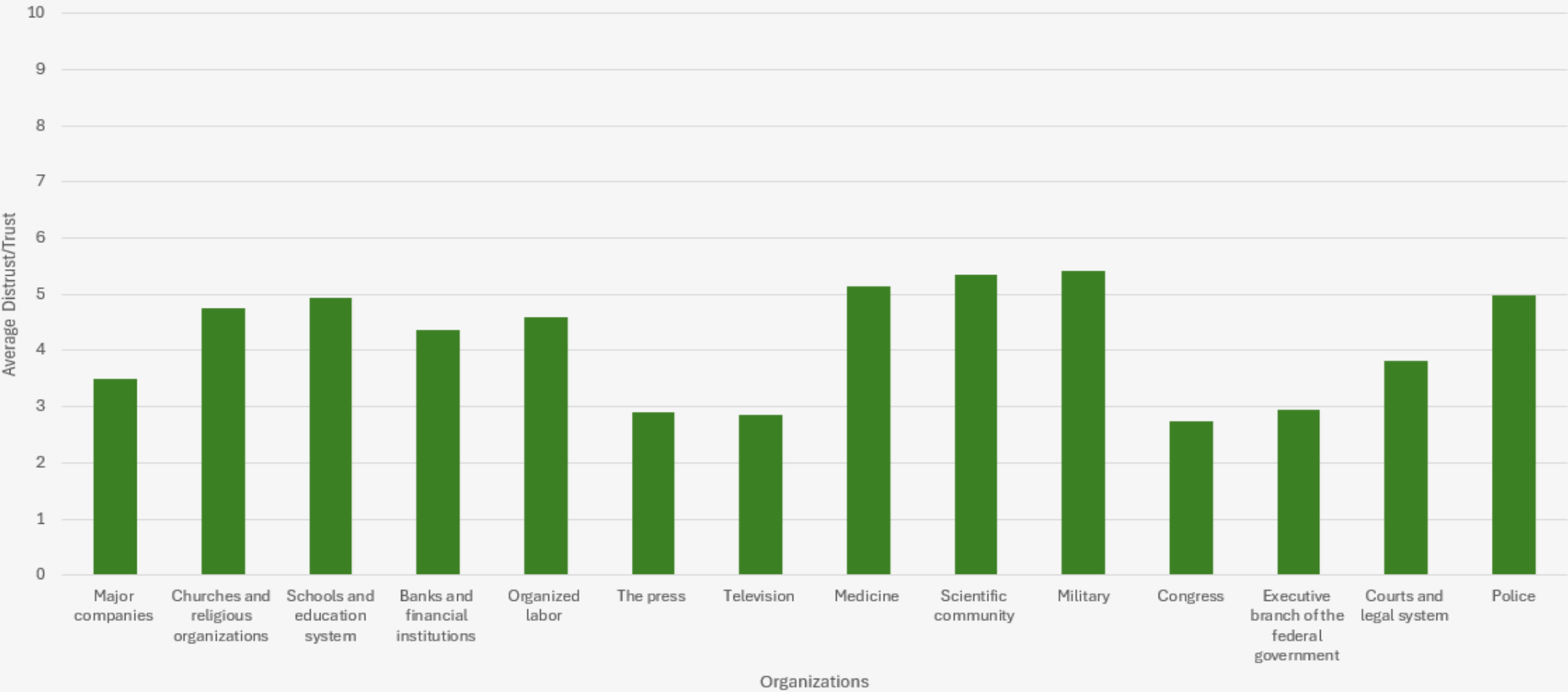


CAROLINA
POPULATION CENTER



Add Health
The National Longitudinal Study of Adolescent to Adult Health

Weighted Average Distrust/Trust in Organizations at Wave VI



Test My Brain (TMB) Cognitive Test Battery (Samples 1 & 2)

Verbal Paired Associates

4 of 25

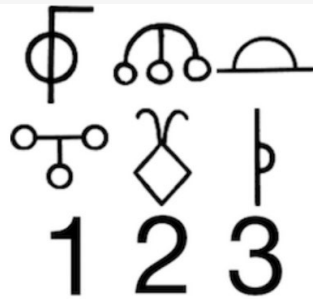
ADVANTAGE - FACT

6 of 25

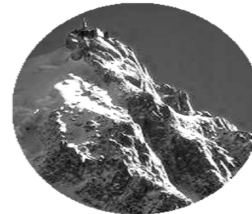
CHANCE - ?

1. IMPRESSION
2. AMOUNT
3. ACCOUNT
4. QUESTION

Digit Symbol Matching



Gradual Onset Continuous Performance Test



Backward Digit Span

532

Then press the numbers on the **keyboard** in **reverse** order.

Test My Brain (TMB) Measures and Timing: Sample 1 & Sample 2

Test Name	Construct	Main Outcome(s)	Time (min)
Verbal Paired Associates	Verbal Memory	# of words correctly recalled	5
Digit Symbol Matching	Processing Speed	Median reaction time of correct response	2
Gradual Onset Continuous Performance Test	Executive function, Response Inhibition, & Sustained Attention	Dprime	4
Backward Digit Span	Short-term memory	Maximum length of number string correctly recalled	3.5
Total Time			14.5