

# The National Longitudinal Study of Adolescent to Adult Health (Add Health): Brief History, Updates, & Exciting Wave VI Plans\*

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# Add Health Origins & Evolution

Developed in response to a 1993 Congressional mandate to fund a longitudinal study of adolescent health; project began in 1994 with primary funding from NICHD

Originally two waves (Waves I and II) conducted in 1994-95 and 1995-96; evolved into multi-wave design in early 2000s

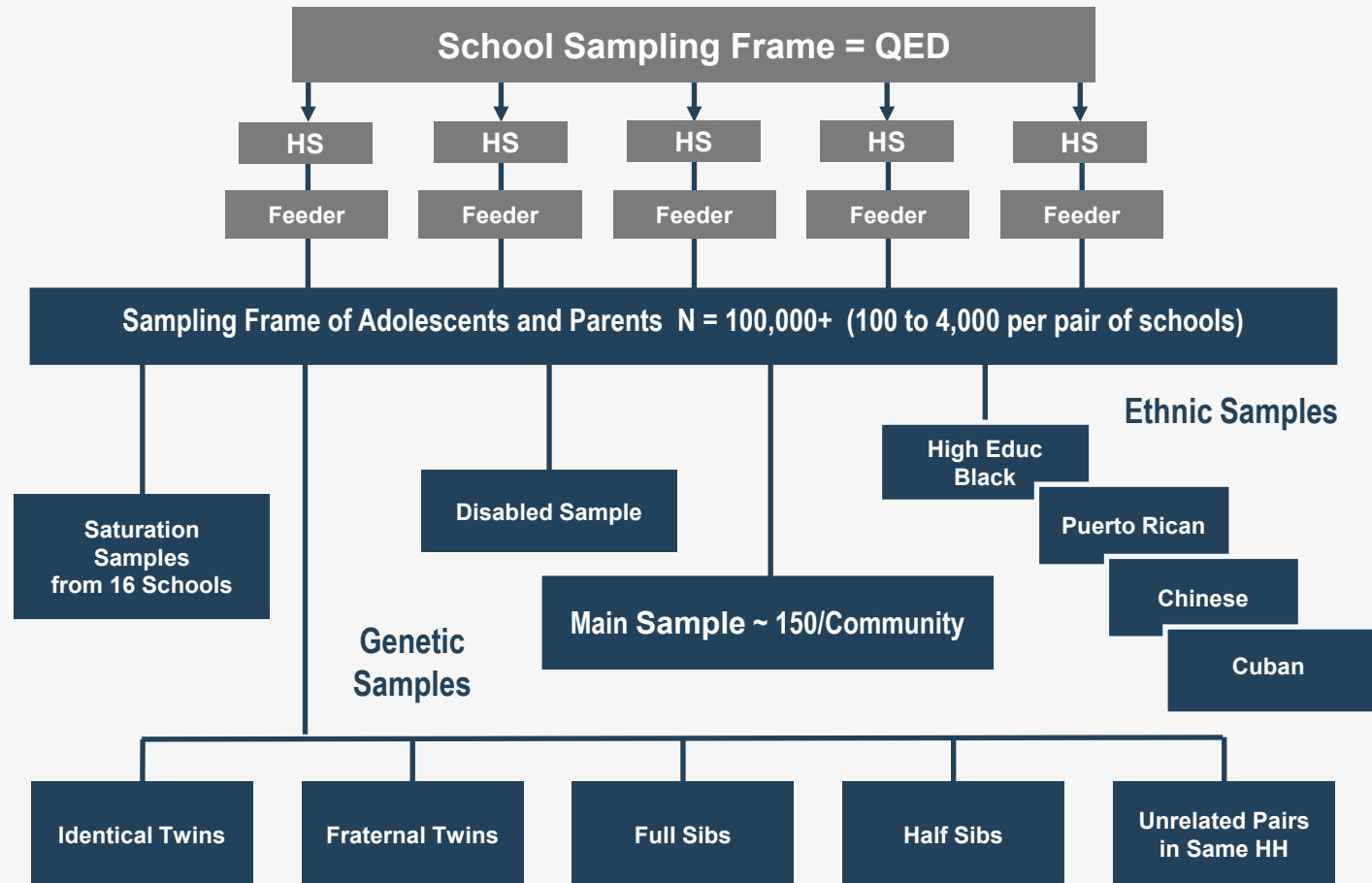
Originally called the National Longitudinal Study of Adolescent Health; renamed the National Longitudinal Study of Adolescent to Adult Health with Wave V in 2014

Recipient of 2016 Golden Goose Award

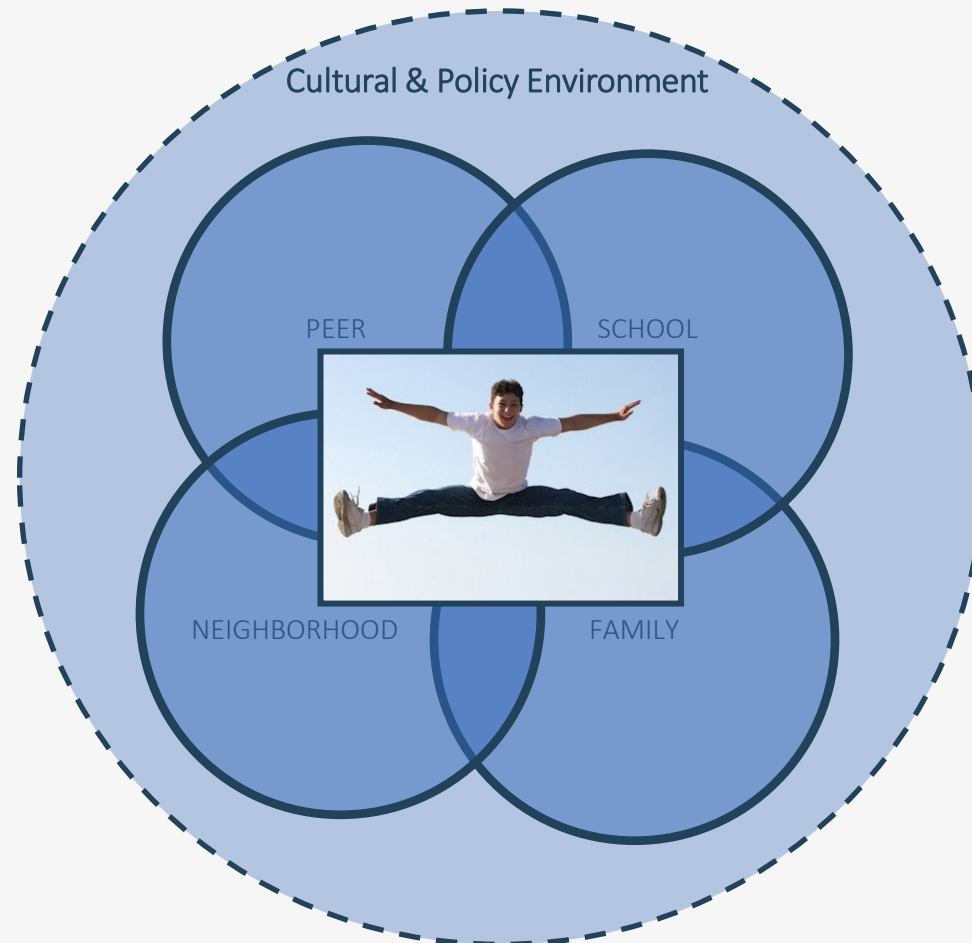
Most recently, Wave VI was funded primarily by NIA (2021-25)



# Add Health Sample Design

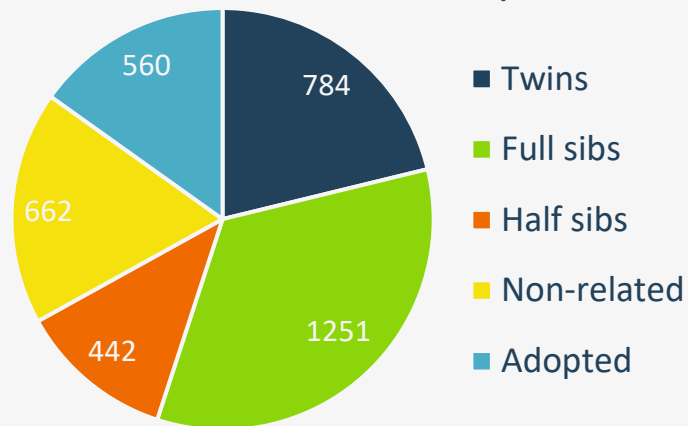


# Original Add Health Multi-Level Conceptualization



# Innovative Features of the Initial Add Health Design

Genetic Sub-Sample  
N = 3,699



Family Structure, Wave I	N
2 Biological parents	10,339
2 Adoptive parents	403
Bio Mom/Step Dad	2,756
Bio Dad/Step Mom	591
Single Mom	4,520
Single Dad	637
Surrogate parent(s)	1,499
<b>Total</b>	<b>20,745</b>

# Add Health Innovative Design: Wave I Race/Ethnicity\*

	N	%
Latina/o or Hispanic	3,492	16.9
Black or African American	4,601	22.2
Asian American	1,585	7.6
American Indian / Alaska Native	248	1.2
NH White	10,760	52.0
Other/Unknown	59	0.2
Total	20,745	100.0

\* One of many ways to measure race and/or ethnicity in Add Health.

# Add Health Grows Up...

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# Add Health longitudinal, multi-level, intergenerational design

(Each wave also includes contextual data specific to various levels of geography)

Wave	Administrative		Survey Administration		Biological Data Collection
Wave I 1994-95 (RR=79%)	Students N=90,118	School Admin N = 144	Adolescents in grades 7-12 N = 20,745	Parent N=17,670	Height, weight
Wave II 1996 (RR=89%)		School Admin N = 128	Adolescents in grades 8-12 N = 14,738		Height, weight
Wave III 2001-02 (RR=77%)	High school transcripts		Young adults Aged 18-26 N = 15,197	Partner N=1,507	Height, weight, STI, HIV, genetic (buccal cell DNA)
Wave IV 2008-09 (RR=80%)			Adults Aged 24-32 N = 15,701		Height, weight, waist, metabolic, immune, inflammation, cardiovascular, medications, candidate genes, GWAS
Wave V 2016-18 (RR=72%)	Birth & death records	Sexual Orientation, Gender Identity & Health N = 2,665	Adults Aged 33-43 N = 12,300	Parent N=3,000	Height, weight, waist, metabolic, immune, inflammation, cardiovascular, renal, medications, gene expression, epigenetic, microbiome
Wave VI 2022-24	Birth & death records		Early midlife adults Aged 40-49		Height, weight, waist, metabolic, immune, inflammation, cardiovascular, renal, medications, gene expression, epigenetic, microbiome, cognitive, physical functioning



# Add Health is exceptionally unique compared to many population-based studies of health:

Prospectively collected data on social, economic, and health experiences since adolescence

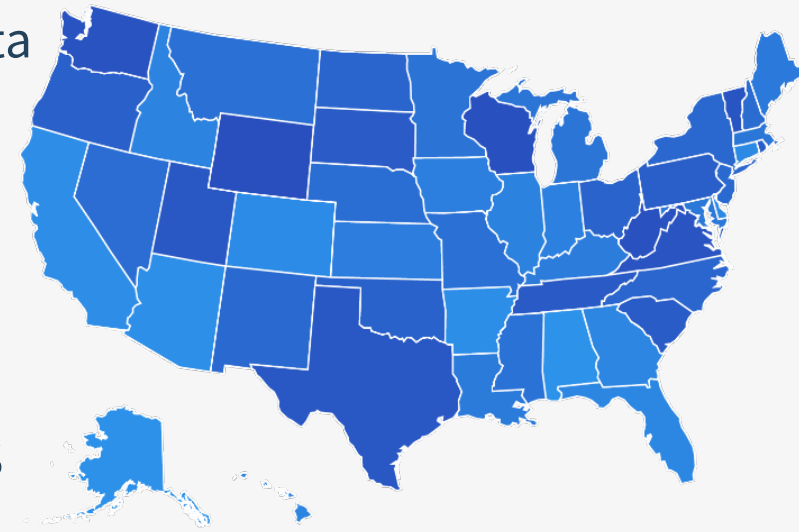
Biomarker, anthropometric, other biological data, and cognitive data before many health outcomes manifest

Rich data from multiple levels ... cellular, individual survey, & contextual data from many levels

Includes parental data from adolescence and, for some parents, in older adulthood

Facilitates analyses of health disparities: racial/ethnic diversity, SES distribution, focus on gender identity & sexual orientation, and geographic distribution

Nationally representative



# Sneak Peek into Wave VI

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# Add Health Wave VI: Overall Goal

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

Add Health as an aging study; maintain longitudinal integrity while innovating:

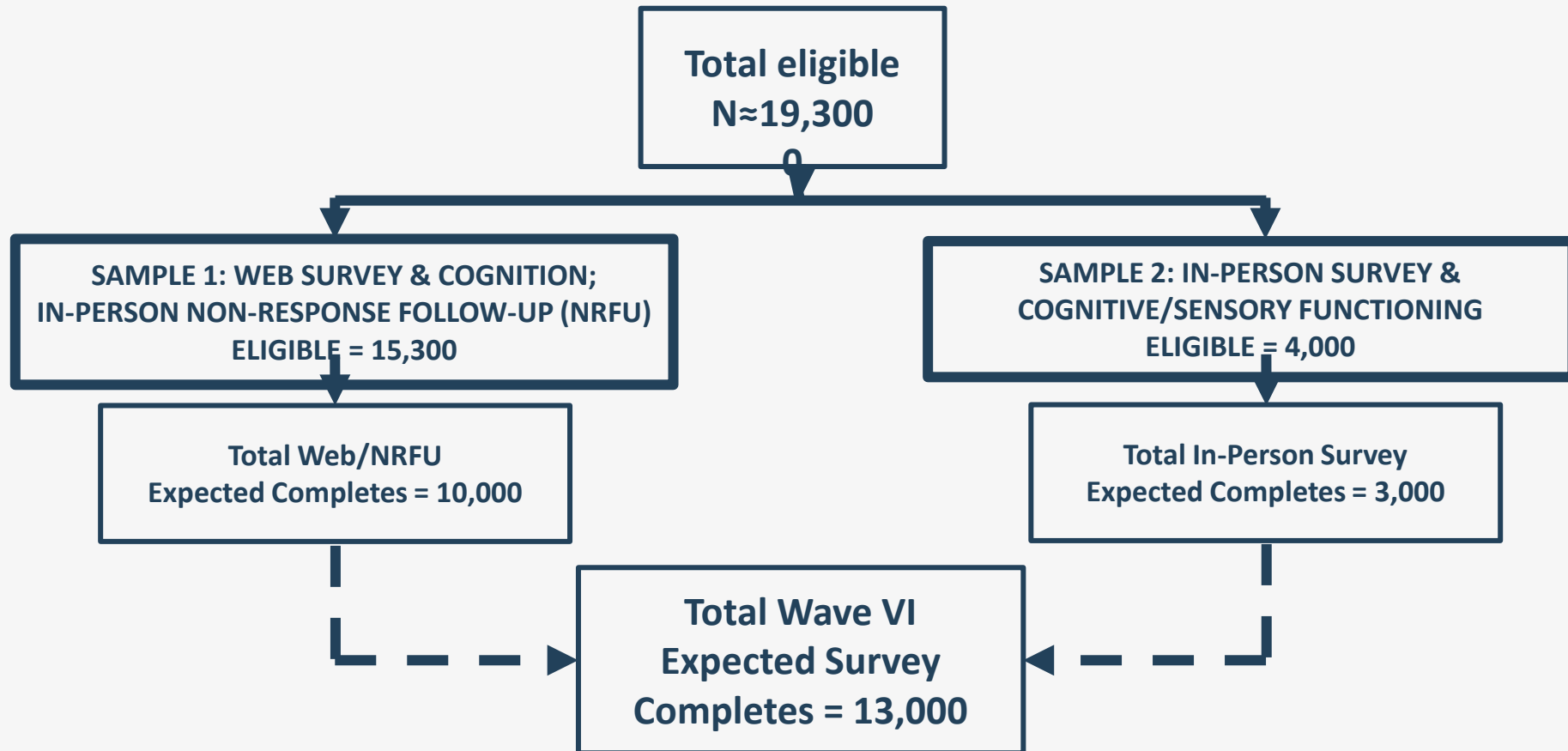
- \* **Disparities** focus (in survey design & content; contextual data)
- \* Ages 40-49: Work; Caregiving; Stress; Discrimination
- \* Behavioral health focus
- \* Cardiometabolic health focus
- \* Cognitive & physical/sensory functioning focus
- \* Mortality surveillance

# Wave VI Summary of Data Domains

Domains: Survey data (3/4 web; 1/4 in-person)  
Cognitive, sensory, and physical functioning  
Contextual data from multiple levels  
Biological data (biomarker, anthropometric, meds)  
Mortality surveillance; birth records

Data ETA: 2025

# Wave VI Survey Design: 2 Sub-Samples



# Wave VI survey enhancements: many related to race/racism, midlife stresses, & health

Multiple measures of race & self-reported skin tone

Multiple measures of discrimination

Chronic stressors

Interactions/experiences with police & criminal justice system

Trust in institutions

Enhanced measures of mental & physical health

Survey measures of cognitive & sensory functioning

# Wave VI In-Home Health Exam Goals

Of ~13,000 survey respondents, our goals are to:

- 1) Collect ~10,000 consents for the home health examination
- 2) Conduct 7,500 home health examinations
- 3) Conduct 100 repeat home health examinations (assess intra-individual variation)
- 4) Receive 4,000 leave-behind microbiome collection kits via mail

# Add Health Bio/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 40-49)
Anthropometric	✓	✓	✓	✓	✓
Omics		✓	✓	✓	✓
Immune/Infectious		✓	✓	✓	✓
Cardiovascular			✓	✓	✓
Metabolic			✓	✓	✓
Medications			✓	✓	✓
Renal/ Liver				✓	✓
Microbiome				✓	✓
Neurocognitive (AD/ADRD Risk)					✓



# Current Add Health Funders

National Institute on Aging (NIA)

Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD)

National Institute on Minority Health and Health Disparities (NIMHD)

National Institute on Drug Abuse (NIDA)

NIH Office of Behavioral and Social Sciences Research (OBSSR)

NIH Office of Disease Prevention (ODP)

# Acknowledgements

Wave VI of Add Health is supported by two grants from the National Institute on Aging (1U01AG071448, principal investigator Robert A. Hummer, and 1U01AG071450, principal investigators Allison E. Aiello and Robert A. Hummer) 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).

Information on obtaining Add Health data is available on the project website (<https://addhealth.cpc.unc.edu>).

# Extra Slides

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# Survey Data 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**  
 Attitudes, religion  
 Economics, expectations  
 Psychological, personality  
 Cognitive  
**Children and parenting**  
**Civic participation**  
**Gambling**  
**Mentoring**

## Wave IV

Demographic  
 Family, sibs, friends  
 Educ, work, military  
 Physical & mental health  
 Health Behaviors & Care  
 Relationships  
 Sexual, & fertility histories  
 Involvmnt 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  
 Educ, work, military  
 Physical & mental health  
 Health Behaviors & Care  
 Relationships  
 Sexual & fertility histories  
 Involvmnt 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**

# Examples of Contextual & Administrative Data

Social network data from respondents' schools

School characteristics which respondents attended

High school transcripts; College contexts

Census and ACS-based data ... tracts, counties, states

Neighborhood: parks, street connectivity, sidewalks, fast food, alcohol outlets, etc.

FBI crime statistics

NCHS mortality rates, life expectancy

Chetty's social mobility contexts

Policy Contexts (e.g., ACA; sexual minority policy; school desegregation)

Pollutants and Climate

National Council of Churches

Birth certificate data (in progress)

Mortality surveillance data (in progress)

# Biological/Clinical Data Across Waves

Adolescence	Transition to Adulthood	Young Adulthood	Adulthood
Waves I-II (Ages 12-20)	Wave III (Ages 18-26)	Wave IV (Ages 24-32)	Wave V (Ages 33-43)
Embedded genetic sample of 3,667			
<b>Physical development</b>			
Height, weight	Height, weight	Height, weight, waist	Height, weight, waist/arm
	<b>Genomic</b> Buccal cell candidate genes	<b>Genomic</b> Buccal cell GWAS	<b>Genomic</b> Whole blood DNAm, gene expression
	<b>Infection</b> STIs, HIV	<b>Immune/Infection</b> CRP, IL-6, IL-8, IL-10, EBV, CMV, <i>H.pylori</i> , HSV	<b>Immune/Infection</b> CRP
		<b>Cardiovascular</b> Blood pressure, pulse	<b>Cardiovascular</b> Blood pressure, pulse
		<b>Metabolic</b> Cholesterol, HbA1c, glucose	<b>Metabolic</b> Cholesterol, triglycerides, HbA1c, glucose
		<b>Medications</b>	<b>Medications</b>
			<b>Renal/Liver</b> Creatinine, cystatin C,
			<b>Microbiome</b> Fecal

# Add Health Selected Impacts to Date

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GRANTS, USERS, PUBLICATIONS AND CITATIONS

# Sampling of Key Contributions

## Cardiovascular Health

- Preeminent dataset for **tracking the obesity epidemic** and cardio-metabolic risk among US young adults in recent years
- Identifying **critical early life exposures and events associated with increased cardiovascular risk in adulthood**, such as infant/child health, socioeconomic status, neighborhood effects, and family relationships and structure

## Disparities and Aging/Life Course

- Documenting the **formation and widening of gender, sexual minority, racial/ethnic, and socioeconomic disparities in key health indicators** from adolescence into early adulthood
- Emphasizing the importance of socioeconomic status, social relationships and stress exposures as **determinants of health and “weathering” throughout the life course**

## Genetics and Health

- **Disentangling the contributions of genetic and socioenvironmental factors** shaping adult health, especially for smoking, obesity, and metabolic risk

## Emerging Trends at Midlife

- Providing a **broader understanding of rising despair among a recent young adult cohort**, spanning multiple indicators of poor mental health and – critically – not limited to rural areas and/or White adults



# Grants

Add Health data have been utilized in ~ **225** NIH grants to date:

◦ <b>NICHD:</b>	<b>111</b>
◦ <b>NIDA:</b>	<b>34</b>
◦ <b>NIAAA:</b>	<b>27</b>
◦ <b>NIMH:</b>	<b>25</b>
◦ <b>NINR:</b>	<b>6</b>
◦ <b>NIDDK</b>	<b>5</b>
◦ <b>NIA:</b>	<b>4</b>
◦ <b>NCI:</b>	<b>4</b>
◦ <b>NIMHD:</b>	<b>4</b>
◦ <b>NHLBI:</b>	<b>3</b>
◦ <b>AHRQ:</b>	<b>2</b>
◦ <b>NIAID:</b>	<b>2</b>

... and more ... NIH, other federal (e.g., NSF), and foundations.

# Users

## Public-Use Data

- Access requirement: Data use agreement
- ~50,000+ researchers

## Restricted-Use Data

- Access requirement: Approved contract (renewed every 3 yrs.)
- ~20+ contracts received each month; recent release of Wave V data substantially increased demand
- Users in **43 U.S. states** (94%) & **26 additional countries** (6%)
- Users from:
  - R1 (74%), R2, R3, International, & Non-Research universities
  - Non-Profit/Private Firms, Medical Schools/Facilities, & Government Agencies

# Publications and Citations

~**4000** peer-reviewed publications with **300,000+** citations

Averaging **150+ publications a year** over past 2 decades

- Almost one published article *per day* over last five years

Broad reach across **multiple disciplines**

- **Medical:** *JAMA, NEJM, BMJ, Preventive Medicine, PLoS One*
- **Public Health/Epidemiology:** *Am. J. of Public Health, Health Affairs, Am. J. of Epidemiology, PNAS, Obesity, Soc Sci & Med*
- **Social Science:** *Demography, Am. Sociological Review, Am. J. of Sociology, Am. Economic Review, J. of Health Economics*

More than 800 dissertations and theses to date

# Will Continue to Solicit, Write, Review, and Help Ancillary Studies Get Funded

- 1) Merges secondary data sources (e.g., neighborhood, county, and state characteristics) onto Add Health respondent files using personal identifiers
- 2) Uses archived bio-specimens collected by the Add Health study to develop new measures



# Add Health Data Availability

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# Obtaining & Using Add Health Data

## 1) Restricted Use:

Through User Contracts

GWAS Data ... through dbGaP

For info, go to:

<https://addhealth.cpc.unc.edu/data/>

<https://www.cpc.unc.edu/projects/addhealth/documentation>

## 2) Public Use: through ICPSR ... go to:

<https://www.icpsr.umich.edu/web/DSDR/studies/21600>

# Other Major Add Health Data Sets

Omics: <https://addhealth.cpc.unc.edu/about/omics/>

- GWAS
- Candidate Genes
- Polygenic Risk Scores

Add Health Parent Study (PIs: Kathleen Mullan Harris & Joseph Hotz):

<https://addhealth.cpc.unc.edu/about/#studies-satellite>

Sexual Orientation, Gender Identity, Socioeconomic Status, and Health Across the Life Course (PIs: Carolyn Tucker Halpern & Kerith Conron) ... data coming soon:

<https://www.cpc.unc.edu/research-themes/projects/sexual-orientation-gender-identity-socioeconomic-status-and-health-across-the-life-course/>