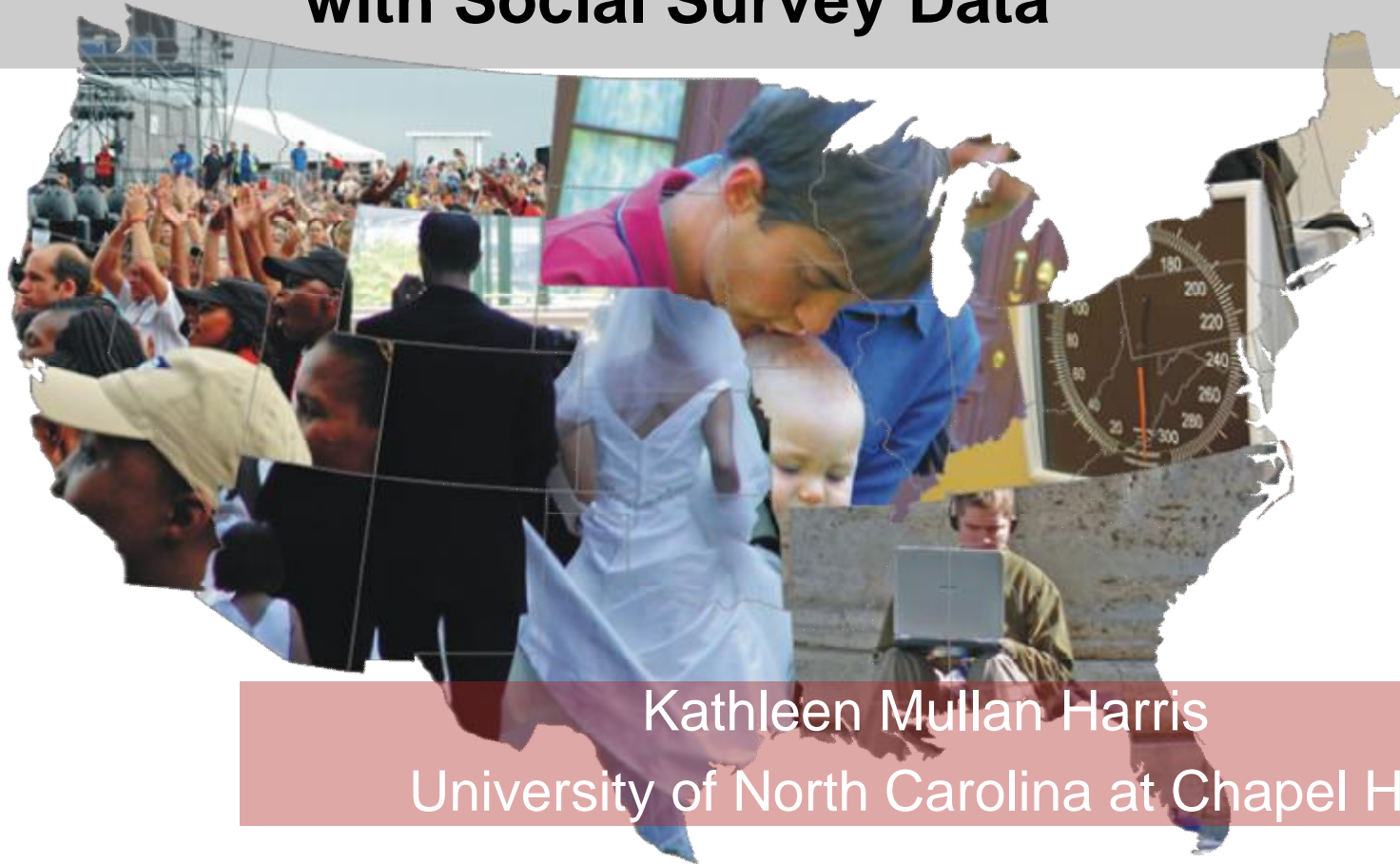


Research Benefits of Linking Biological Data with Social Survey Data



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Research Benefits of Linking Biological Data with Social Survey Data

- Validate self-reports of health.
- Obtain objective measures of health.
- Measure health conditions unknown to survey participants.
- Understand linkages between social, behavioral, and biological processes that impact health and well-being outcomes:
 - Predisease pathways
 - Influence of social factors on health
 - Gene-environment interactions in behavioral and health outcomes
 - Impact of health on social status and social inequality

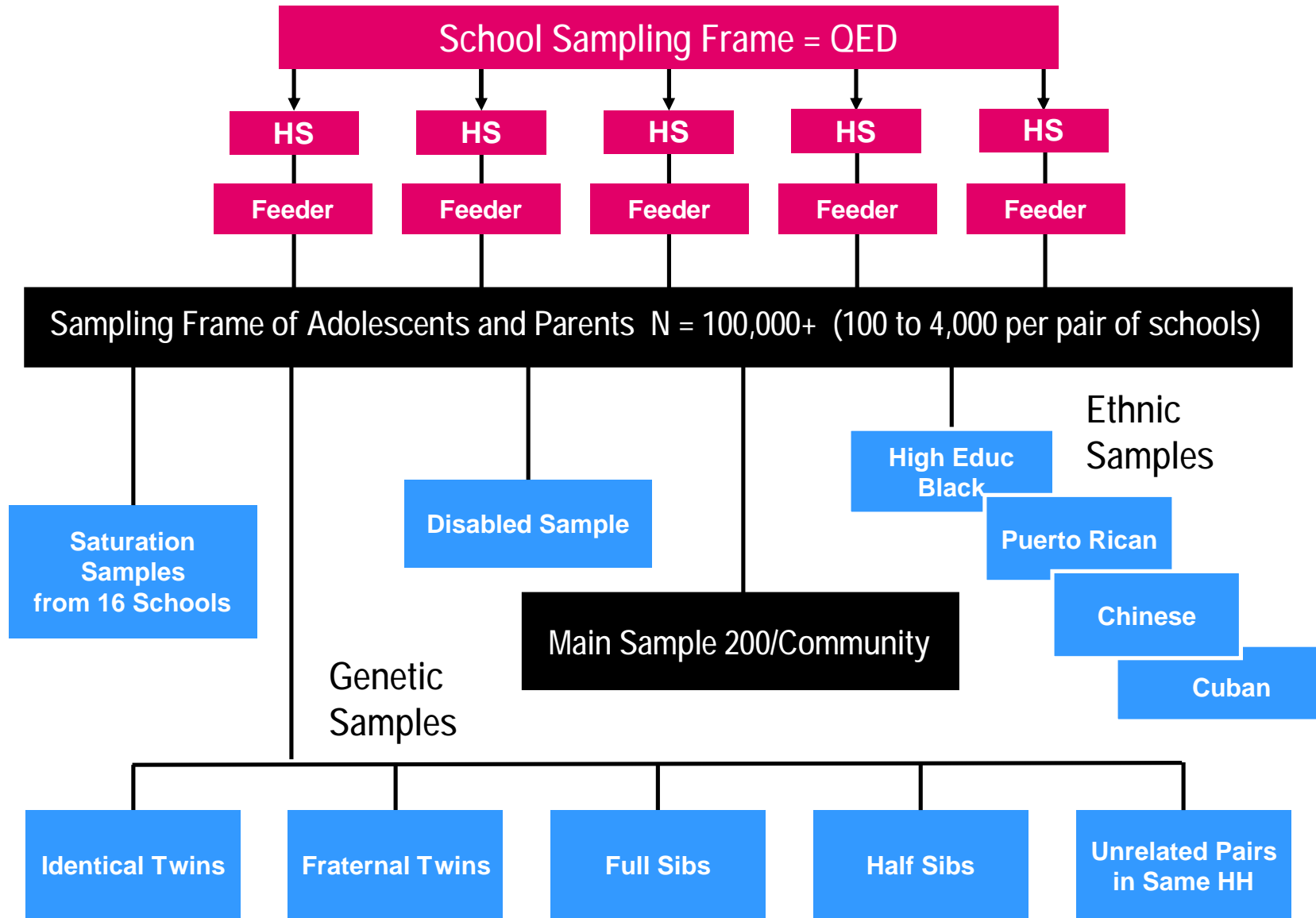
Add Health as a Context for Illustrating the Research Benefits of Linking Biological Data with Social Survey Data

- National Longitudinal Study of Adolescent Health
- Developed in response to a congressional mandate to fund a study of adolescent health.
- Began in 1994 with nationally representative sample of adolescents, following into young adulthood.
- Interdisciplinary team of scientists incorporated biological dimensions of health in its original design.
- Continued to strengthen biological components of data collection and research with each follow-up wave.

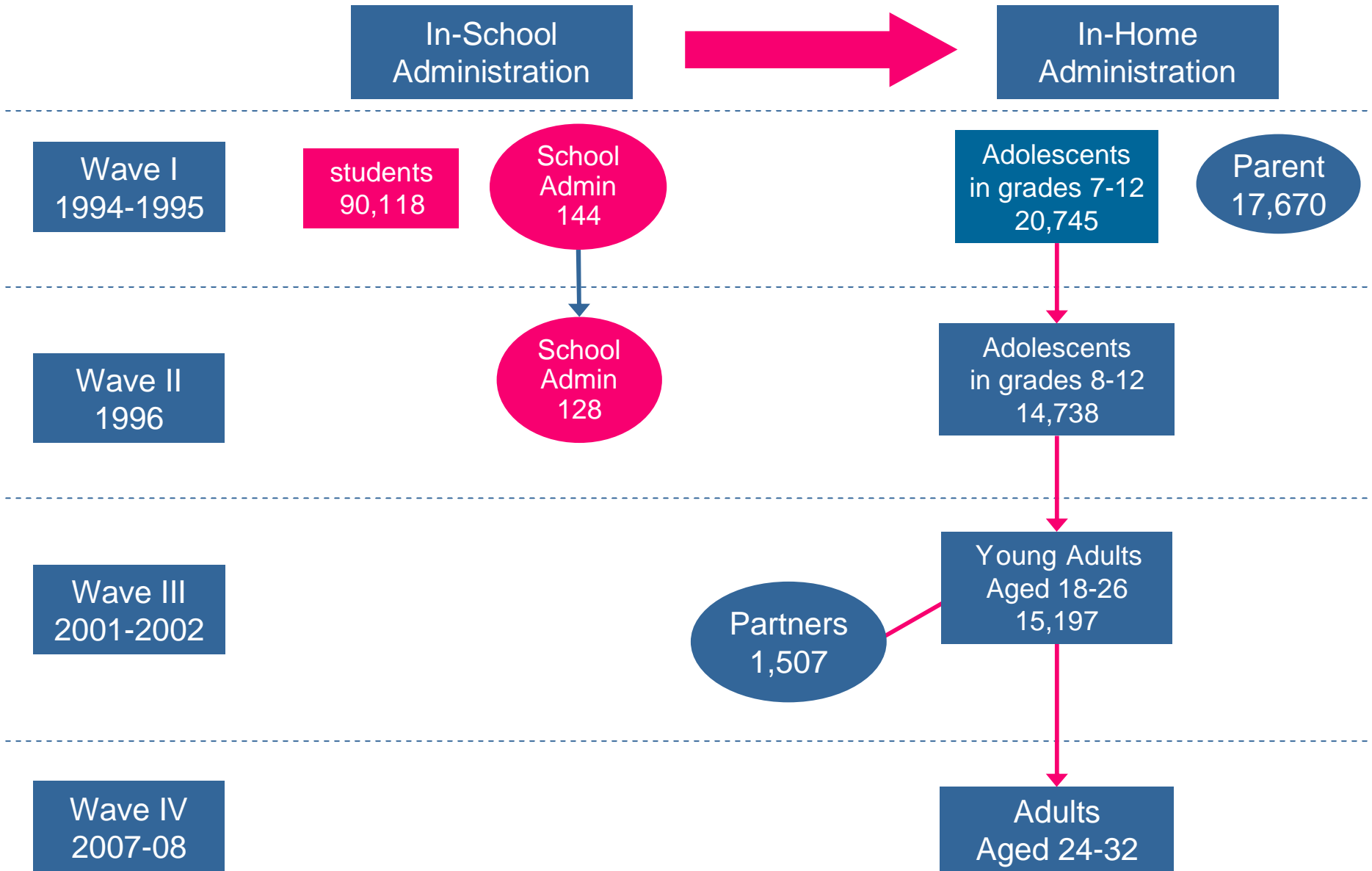
Key Features of Add Health

- Nationally representative study that explores the causes of health and health-related behaviors of adolescents and their outcomes in young adulthood.
- Direct measurement of the social contexts of adolescent life and their effects on health and health behavior.
- Unprecedented racial and ethnic diversity and genetically informed sibling samples.
- Funded by the National Institute of Child Health and Human Development (NICHD) with co-funding from 17 other federal agencies

Sampling Structure for Add Health




Add Health Longitudinal Design



Biological Data Design in Add Health

- § Embedded genetic sample of 3,000 pairs
- § Height and weight (BMI) at all waves
- § Biomarker collection at Wave III (ages 18-26)
 - Saliva and urine to test for STIs and HIV
 - DNA on subset of genetic sample (2,600)
- § Biomarker collection at Wave IV (ages 24-32)
 - Waist circumference
 - Blood pressure, pulse rate
 - Markers of stress, cardiovascular health, diabetes
 - DNA on entire sample (15,000)

Longitudinal Data in Add Health

Adolescence  Young Adulthood

Wave I
(12-19)

Wave II
(13-20)

Wave III
(18-26)

Wave IV
(24-32)

Social environmental data:

school
family
romantic rel
neighborhd
community
peer

school
family
romantic rel
neighborhd
community
peer

college
family
romantic rel
neighborhd
community
peer

college
family
romantic rel
neighborhd
community

Biological data:

Biological resemblance to siblings in household on 3,000 pairs

height
weight
BMI

height
weight
BMI

height,
weight, BMI
STD test results
HIV test results
DNA

ht, wt, BMI
waist
bp, pulse
markers of CVD,
stress, diabetes
DNA

Why did we include these Biomeasures in Add Health?

- Motivation made on scientific grounds
- Theoretical justification
 - Specific life stage of Add Health cohort
 - Prevalent health concerns at those ages
 - Ability to model linkages between social and biological processes
- Contribution to science = research benefits

Research Benefits of Biomeasures in Add Health

- Objective measures of health
 - Consistent with scientific purpose of being a health study
 - Consistent with design of Add Health
- Obtain valid measures of health conditions and prevalence
 - Many health conditions are unknown to individuals.
 - National representation of Add Health document changing prevalence of health conditions or age-specific prevalence.
- Model linkages between social, behavioral, and biological processes to understand developmental and health trajectories across the life course.

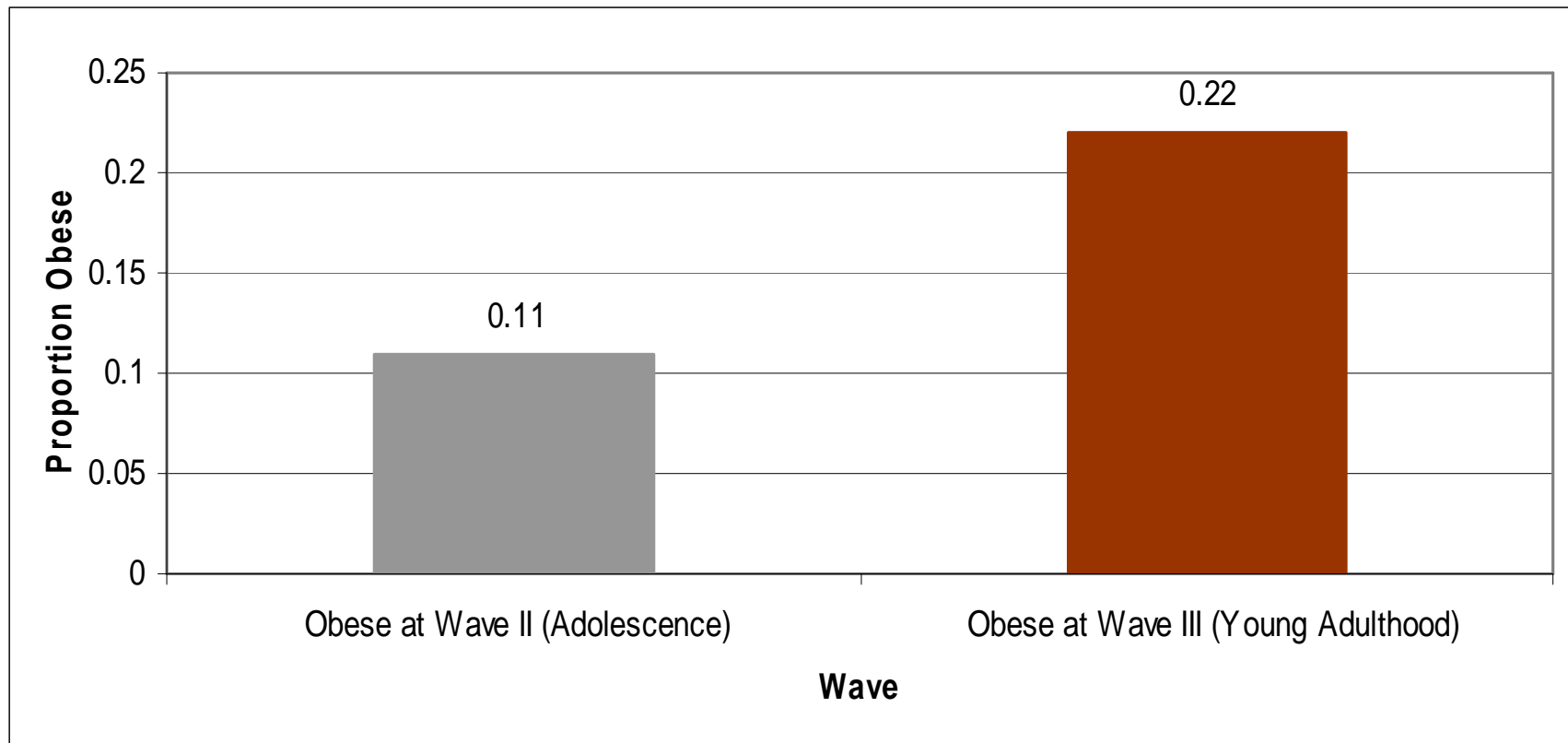
Research Benefits linked to Study Design

- Embedded genetic sample in original design allows researchers to isolate environmental effects from genetic influence.
- Rich longitudinal social and behavioral data—major strength of Add Health—combined with biological data create new research opportunities:
 - DNA provides immense opportunity to study gene X environment interaction effects
 - Cumulative disadvantage and stress biomarkers
- Add Health began in early adolescence and is therefore ideal to study the aging process:
 - Identify the origins of future health problems and disease
 - Identify the origins of health disparities and track their patterns across the life course

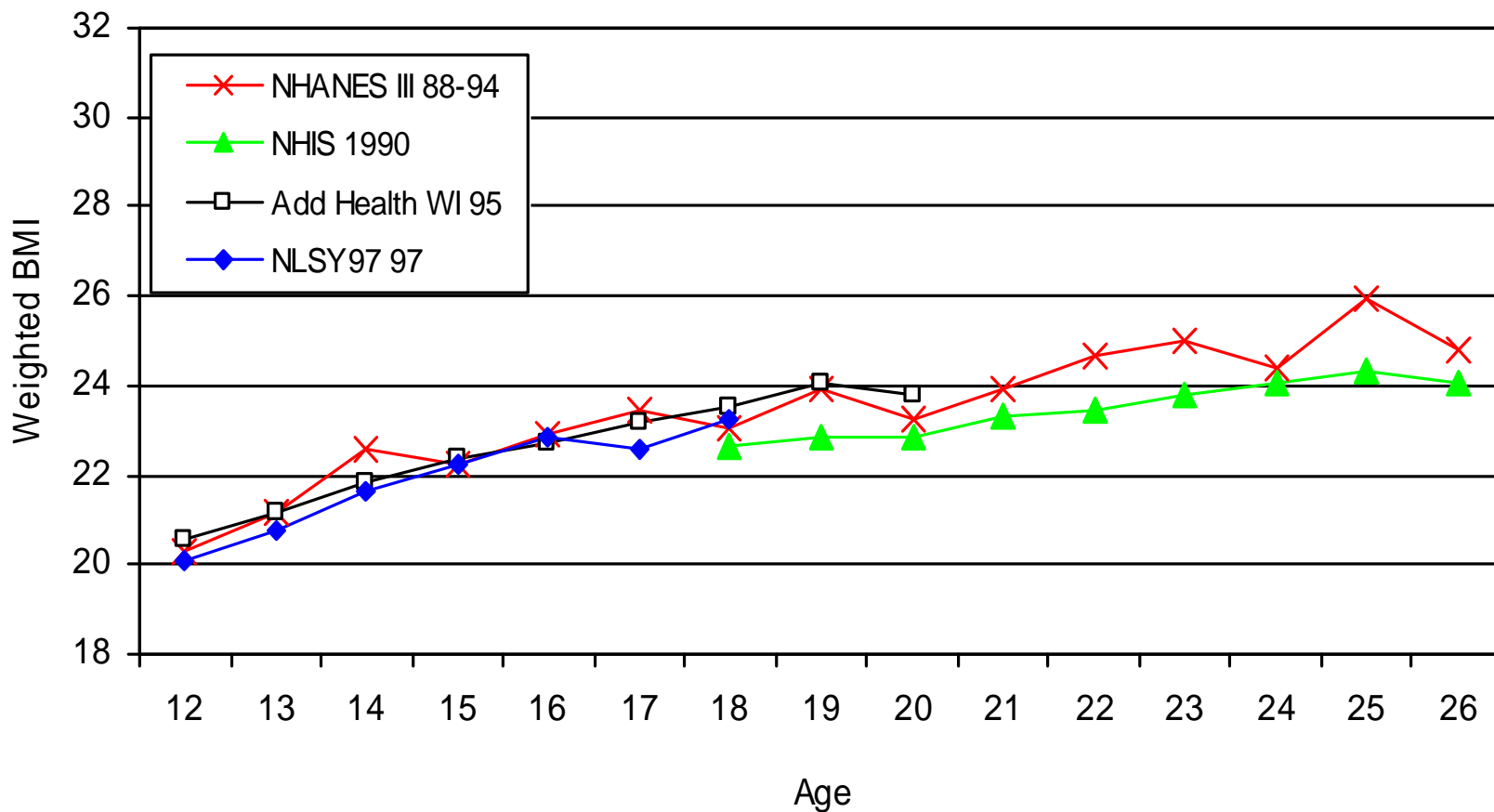
Examples of Research Benefits of Linking Biological Data with Social Survey Data in Add Health

- Objective measures of health
- Valid measures of national prevalence estimates
- Measured versus self-reports of health
- Modeling social, behavioral, and biological linkages in pre-disease pathways

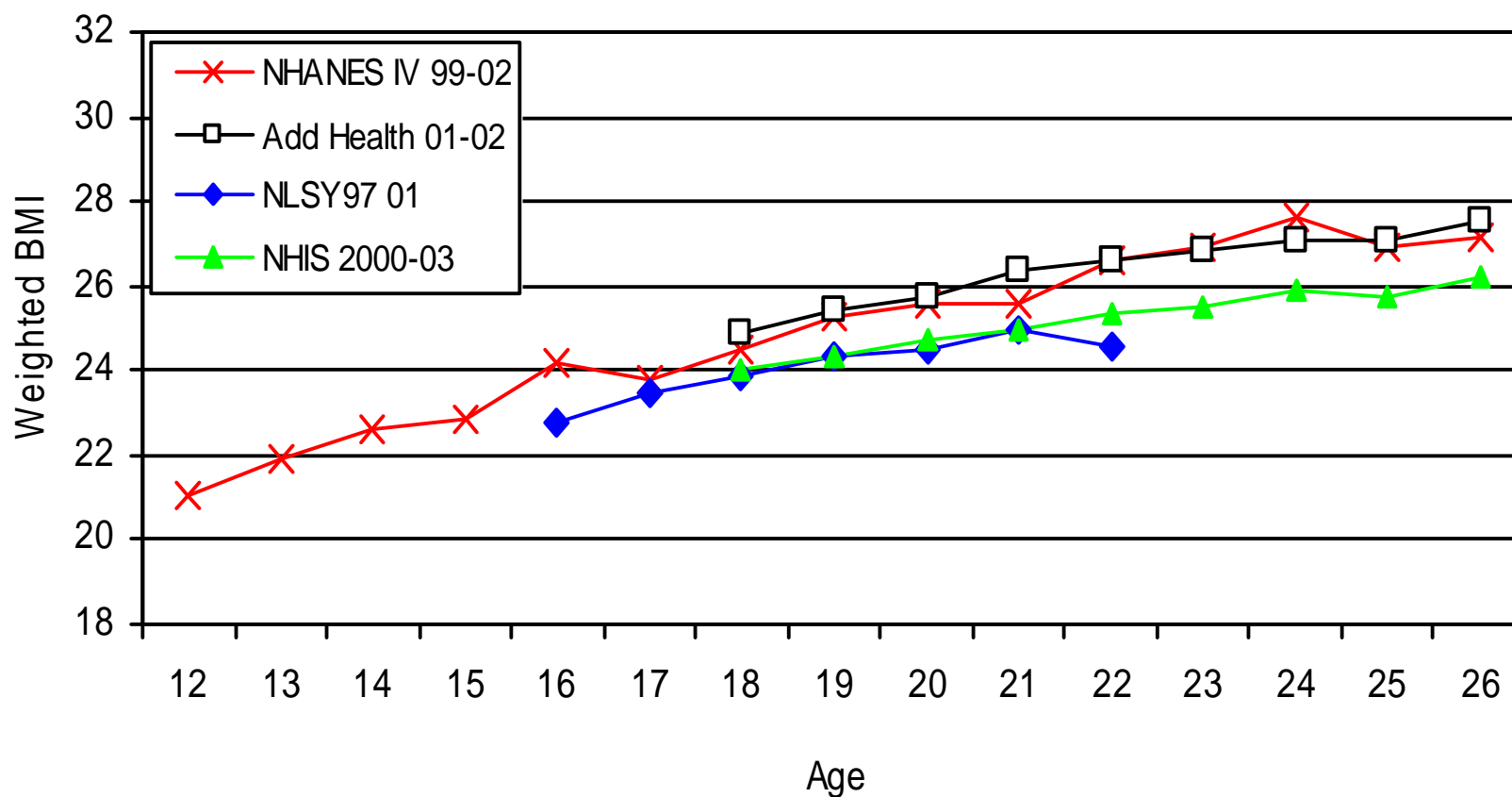
Prevalence of Obesity in Adolescence and Young Adulthood



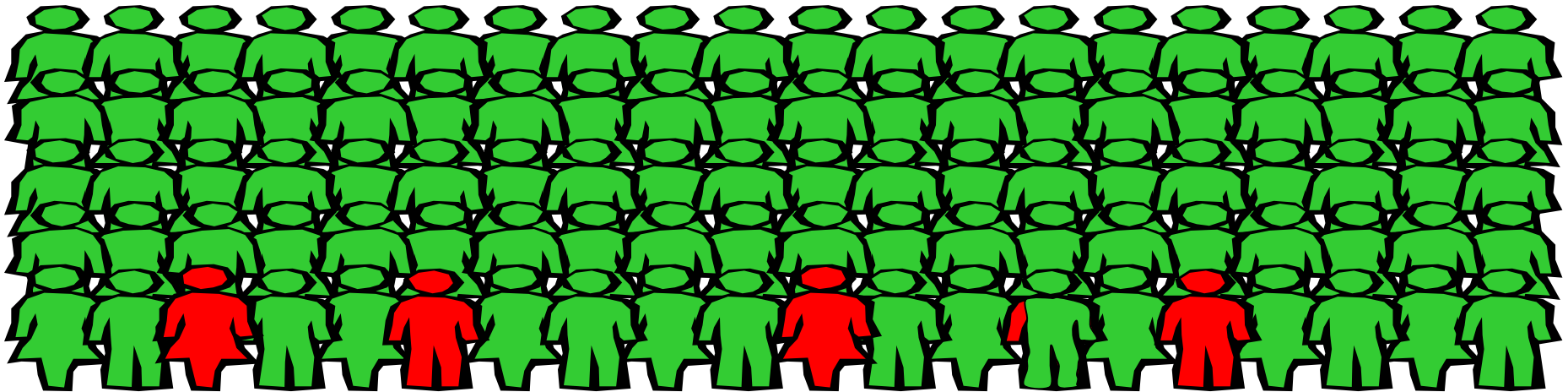
Comparing National Datasets: Weighted BMI, 1990's



Comparing National Datasets: Weighted BMI, 1999-2003



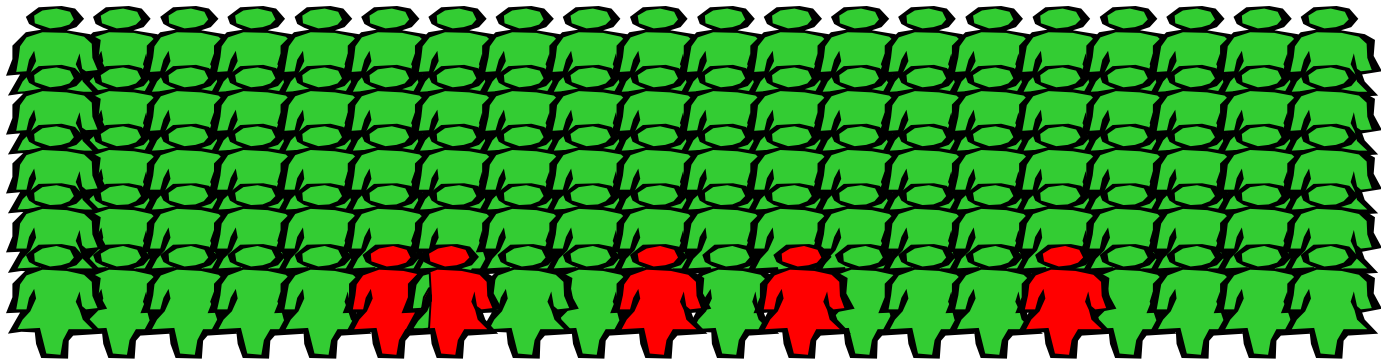
Prevalence: *Chlamydia trachomatis*



Chlamydia trachomatis was detected in 4.19% of all 18-26 year olds in Add Health

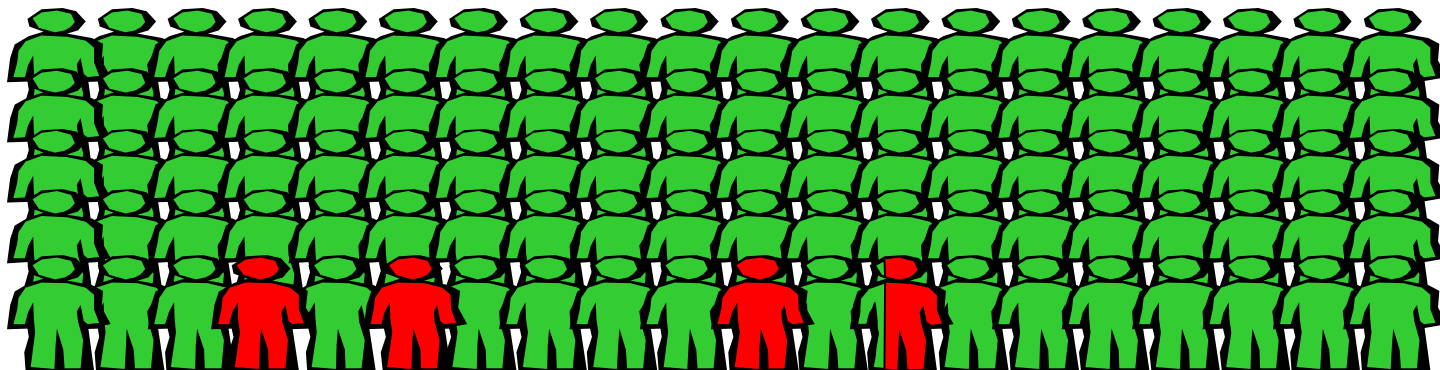
Miller, W.C., Ford, C.A., Morris, M. et al. (2004). Prevalence of Chlamydial and Gonococcal infections among young adults in the U.S. *JAMA*, 291, 2229-2236.

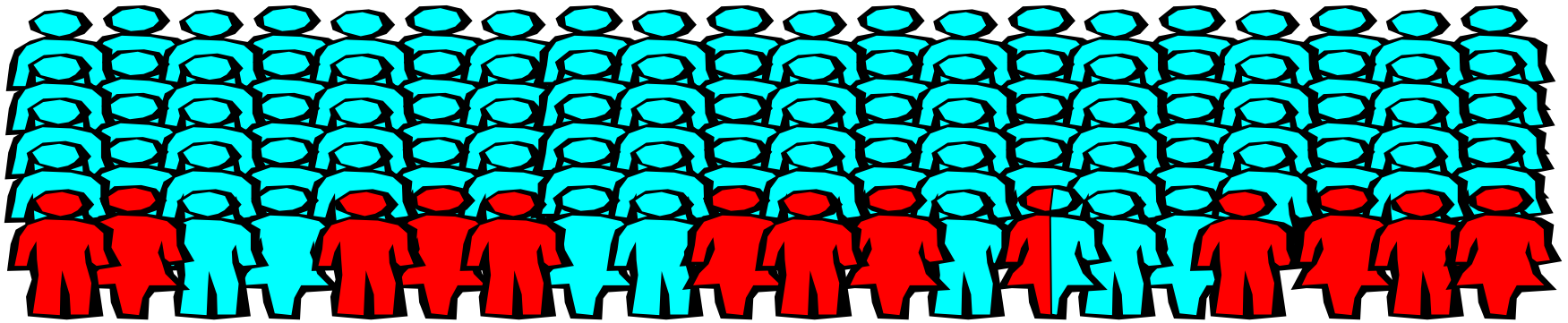
Prevalence: *Chlamydia trachomatis* by Biological Sex



Women: 4.75%

Men: 3.67%





12.54% of African Americans (above)



5.89% of Latinos (above) and 1.94% of Whites (below)



Other Prevalence

- Gonorrhea
 - < 1% overall (2% for Black resps)
- Trichomoniasis
 - 2.3% overall,
 - 6.9% for Black and 4.1% for Native American resps
- HIV
 - First population-based estimates of HIV prevalence among 19-24 year olds in US
 - Overall, about 1 in 1000 tested positive
 - Projected 21,400 young adults HIV positive

Miller, W.C. Swygard, H., Hobbs, M.M., et al. (2005). The prevalence of Trichomoniasis in Young Adults in the United States. *Sexually Transmitted Diseases*, 32, 593-598.

Morris, M. Handcock, M. Miller, W.C., et al. (In press). Prevalence of HIV infection among young adults in the US: Results from the Add Health Study. *American Journal of Public Health*.

Self-reports vs. test results of STDs

- Is a virginity pledge protective from having an STD?
- **NO:** Bruckner and Bearman. 2005. “After the Promise: The STD Consequences of Adolescent Virginity Pledges.” *Journal of Adolescent Health* 36:271-278.
 - STD rates no different among pledgers and non-pledgers
 - Used data based on STD test results
- **YES:** Rector and Johnson. 2005. “Adolescent Virginity Pledges, Condom Use and Sexually Transmitted Diseases among Young Adults.” Paper presented at the National Welfare Research and Evaluation Conference.
 - Pledgers have lower STD rates than non-pledgers
 - Used data from STD self-reports

Prevalence of Health Conditions in the Wave IV Population (prelim data)

Health Condition	Percent
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Pre-hypertension / Hypertension

med use	3.4
self-report	10.6
med use or self-report	11.4
med use, self-report, SBP \geq 160 OR DBP \geq 100	13.3
med use, self-report, SBP \geq 140 OR DBP \geq 90	24.8

Diabetes

med use	1.4
self-report	2.9
med use or self-report	3.2
med use, self-report or glucose \geq 200	3.9
med use, self-report, glucose \geq 200 OR HbA1C \geq 6.5	6.4

Gene-Environment Interactions & Pre-Disease Pathways

