The National Longitudinal Study of Adolescent to Adult Health

Wave V: Biological Data Collection

Biomarker Network Meeting
March 30, 2016
Carolina Population Center
University of North Carolina at Chapel Hill

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• Howard W. Odum Professor, Sociology
• Investigator, Add Health

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• James Haar Distinguished Professor, Sociology
• Director, Add Health
Add Health – following the cohort for 20+ years

National Longitudinal Study of Adolescent Health

→ National Longitudinal Study of Adolescent to Adult Health

<table>
<thead>
<tr>
<th>Wave</th>
<th>Year of data collection</th>
<th>N</th>
<th>Cohort description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wave I</td>
<td>1995</td>
<td>20,745</td>
<td>Adolescents in grades 7-12 and one of their parents interviewed in the home</td>
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<tr>
<td>Wave II</td>
<td>1996</td>
<td>14,738</td>
<td>Adolescents in grades 8-12</td>
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<tr>
<td>Wave III</td>
<td>2001-02</td>
<td>15,197</td>
<td>Young adults, 18-26 years old</td>
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<tr>
<td>Wave IV</td>
<td>2008-09</td>
<td>15,701</td>
<td>Adults, 24-32 years old</td>
</tr>
<tr>
<td>Wave V</td>
<td>2016-18</td>
<td>in the field now</td>
<td>Adults, 32-42 years old</td>
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</table>
Wave V Overall Goals

• Assess 4\textsuperscript{th} decade of life $\rightarrow$ hypothesized explosion of chronic disease

• Re-interview Add Health cohort members to collect social, environmental, behavioral, and biological data

• Add and refine early-life measures of birth and childhood

• With existing longitudinal data, create a 40-year life course record

• Test hypotheses about developmental origins of health and disease
Wave V Data Collection: 2016-2018

- survey data – some relevant to health status and biomarkers
  - mixed mode: web preferred, mail backup
  - continuous interviewing 2016-2018

- birth records of respondents and their children from a subset of states

- surveillance of chronic disease events – start with causes of death

- in-home visits to collect biological measures and specimens
  - using research division of an examination management service
  - venous blood draw, fasting
Add Health Choice of Biological Data

• Biological states prevalent in the general population, from youth into adulthood
• Biological states and processes linked to future health
• Measures that can characterize those processes
• Feasible for a large scale, national field study
• Valid and reliable measures
• Appropriate for longitudinal designs
<table>
<thead>
<tr>
<th>Biological Data Measures Collected Across Waves</th>
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<tr>
<td><strong>Adolescence</strong></td>
</tr>
<tr>
<td>Anthropometric</td>
</tr>
<tr>
<td>STI &amp; HIV measures</td>
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<tr>
<td>Genomic</td>
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<tr>
<td>Immune function</td>
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<td>Inflammation</td>
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<td>Cardiovascular</td>
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<tr>
<td>Pharmacologic</td>
</tr>
<tr>
<td>Renal function</td>
</tr>
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<td>Embedded genetic sample of ~3,000 pairs</td>
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### Biological Data Measures Collected Across Waves

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<tr>
<td>STI &amp; HIV measures</td>
<td>Metabolic</td>
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**Embedded genetic sample of ~3,000 pairs**
Wave V Biomarker Overview

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<tr>
<th>Domains</th>
<th>Measures</th>
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<tr>
<td><strong>LONGITUDINAL REPEAT MEASURES</strong></td>
<td></td>
</tr>
<tr>
<td>Cardiovascular</td>
<td>systolic BP, diastolic BP, pulse rate</td>
</tr>
<tr>
<td>Anthropometric</td>
<td>weight, height, arm &amp; waist circumference</td>
</tr>
<tr>
<td>Metabolic</td>
<td>HbA1c, glucose, total cholesterol, HDL-cholesterol, triglycerides</td>
</tr>
<tr>
<td>Inflammatory / Immune</td>
<td>hs-CRP</td>
</tr>
<tr>
<td>Pharmacologic</td>
<td>prescription medication use &amp; classification</td>
</tr>
<tr>
<td><strong>NEW MEASURES AT WAVE V</strong></td>
<td></td>
</tr>
<tr>
<td>Renal function</td>
<td>creatinine, cystatin C</td>
</tr>
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Wave V Equipment
Wave V Biomarkers
Cardiovascular Data Collection Protocol

• **Systolic BP, Diastolic BP & Pulse Rate**
  
  ▪ measure 3 times @ 30-sec intervals
  ▪ average of last 2 measures
  
  ▪ resting & seated respondents
  ▪ legs uncrossed & feet flat on floor
  ▪ measure arm circumference, match cuff

Wave V Biomarkers
Anthropometric Data Collection Protocol

- arm circumference
- waist circumference
- height
- weight

- respondent dressed, no shoes
- scale placed on uncarpeted floor
Wave V Biomarkers

Venous Whole Blood Collection

- 5 or 6 vacutainer tubes
  - serum
  - plasma
  - buffy coat/RBCs
  - PAXgene
  - Na Fl/Pot Ox (glucose substudy)
- provide most assay results to respondents who want them
  - trained & certified phlebotomists
  - fasting respondents (ideally)
### Wave V Biomarkers:
**Assays on Blood + Archive of Specimens**

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Wave V Biomarkers
Pharmacologic Data

• prescription medications
• select over-the-counter medications (salicylates & NSAIDS)

• therapeutically classified (Multum Lexicon Plus®)
• classification examples
  ▪ anti-hypertensives
  ▪ anti-hyperlipidemias
  ▪ anti-depressants
  ▪ anti-inflammatory
  ▪ other classes
Two Wave V Biomarker Sub-studies

- **Intra-individual Variation (IIV) to assess reliability**
  - sample of ~100 respondents with complete data at first home visit asked to repeat visit within 1-2 weeks
    - stratified by race/ethnicity and gender
  - assess repeated values while controlling as many factors as possible

- **Glucose sub-study to assess validity**
  - sample of ~100 respondents
    - stratified by race/ethnicity, gender, and Wave IV HbA1c measures
  - two glucose assays to assess effects of delayed time from blood collection
    - standard serum tube & tube with sodium fluoride preservative
  - compare assay results
To Explore and Get Add Health Data

- **Add Health Codebook Explorer (ACE)**
  www.cpc.unc.edu/projects/addhealth/codebooks/ace

- **Public use data – random subset of all respondents**
  www.cpc.unc.edu/projects/addhealth/data/publicdata

- **Restricted use data – available by contractual agreement**
  www.cpc.unc.edu/projects/addhealth/data/restricteduse
Biennial conference for Add Health data users
Held at NIH Campus in Bethesda, MD
June 20-21, 2016
Registration open

Features of the conference include:

- An opportunity to hear about Add Health research projects, and talk with other data users
- Attend methodological sessions
- Travel stipends available to students, postdocs and recent postdocs

www.cpc.unc.edu/projects/addhealth/events/2016-add-health-users-conference
Add Health Co-Funders

- National Institute of Child Health and Human Development*^  
- National Cancer Institute*  
- National Center for Health Statistics, Centers for Disease Control and Prevention, DHHS  
- National Center for Injury Prevention and Control, Centers for Disease Control and Prevention, DHHS*  
- National Center for Minority Health and Health Disparities*  
- National Institute of Allergy and Infectious Diseases*  
- National Institute of Deafness and Other Communication Disorders*^  
- National Institute of General Medical Sciences  
- National Institute of Mental Health  
- National Institute of Nursing Research*  
- National Institute on Aging*  
- National Institute on Alcohol Abuse and Alcoholism*  
- National Institute on Drug Abuse*^  
- National Science Foundation*^  
- Office of AIDS Research, NIH*  
- Office of the Assistant Secretary for Planning and Evaluation, DHHS*  
- Office of Behavioral and Social Sciences Research, NIH*  
- Office of the Director, NIH^  
- Office of Minority Health, Centers for Disease Control and Prevention, DHHS  
- Office of Minority Health, Office of Public Health and Science, DHHS  
- Office of Population Affairs, DHHS*  
- Office of Research on Women’s Health, NIH*  

*Wave 4 co-funders  
^Wave 5 co-funders
Questions?