RUTGERS
THE STATE UNIVERSITY
OF NEW JERSEY

New Jersey Population Health Cohort Study

Presentation to the
NJ ACTS Team Science Core

April 20, 2023

NEW JERSEY
POPULATION HEALTH
COHORT STUDY
More Than Health

Outline

- Acknowledgements
- Our Team
- About the NJ Cohort
- Team Science and Cohort Sustainability

Acknowledgements

The Robert Wood Johnson Foundation with additional resources from Rutgers Biomedical and Health Sciences have provided generous support for the NJ Cohort Study

Advisors and colleagues from across Rutgers have given generously of their time to help shape the Cohort Study design and implementation

Our dedicated and talented staff make the NJ Cohort happen

Our community partners engage with us and contribute to recruitment

NJ Cohort participants give generously of their time and share their often sensitive and personal information

Cohort Study Leadership

Joel Cantor, ScD
Principal Investigator
Public Policy

Paul Duberstein, PhD
Sr. Co-Investigator
Health Psychology

William Hu, MD, PhD
Sr. Co-Investigator
Cognitive Neurology

Dawne Mouzon, PhD
Sr. Co-Investigator
Sociology

Michael Yedidia, PhD
Sr. Co-Investigator
Sociology

Stephanie Bergren
Project Director

Margaret Koller, MS
Exec. Administrator

Steven Cohen, PhD
Consultant
RTI International

Scientific Leadership Team

Joel C. Cantor, ScD (PI) – Health Services and Policy Research, Distinguished Professor & Director Center for State Health Policy, IFH

Paul Duberstein, PhD – Clinical and Community Psychology, Professor & Chair Dept. of Health Behavior, Society and Policy, SPH

William Hu, MD, PhD – Behavioral Neurology and Neuropsychiatry, Associate Professor, Chief of Cognitive Neurology RWJMS, Director Center for Healthy Aging IFH

Dawne Mouzon, PhD, MPH – Medical Sociology, Associate Professor Dept. of Sociology

Michael Yedidia, PhD, MPH – Medical Sociology, Research Professor IFH Center for State Health Policy

Steven Cohen, PhD – Biostatistics, Vice President Division for Statistical and Data Sciences, RTI

TBD Recruiting – Epidemiology, demography, population science?

Goal and Aims

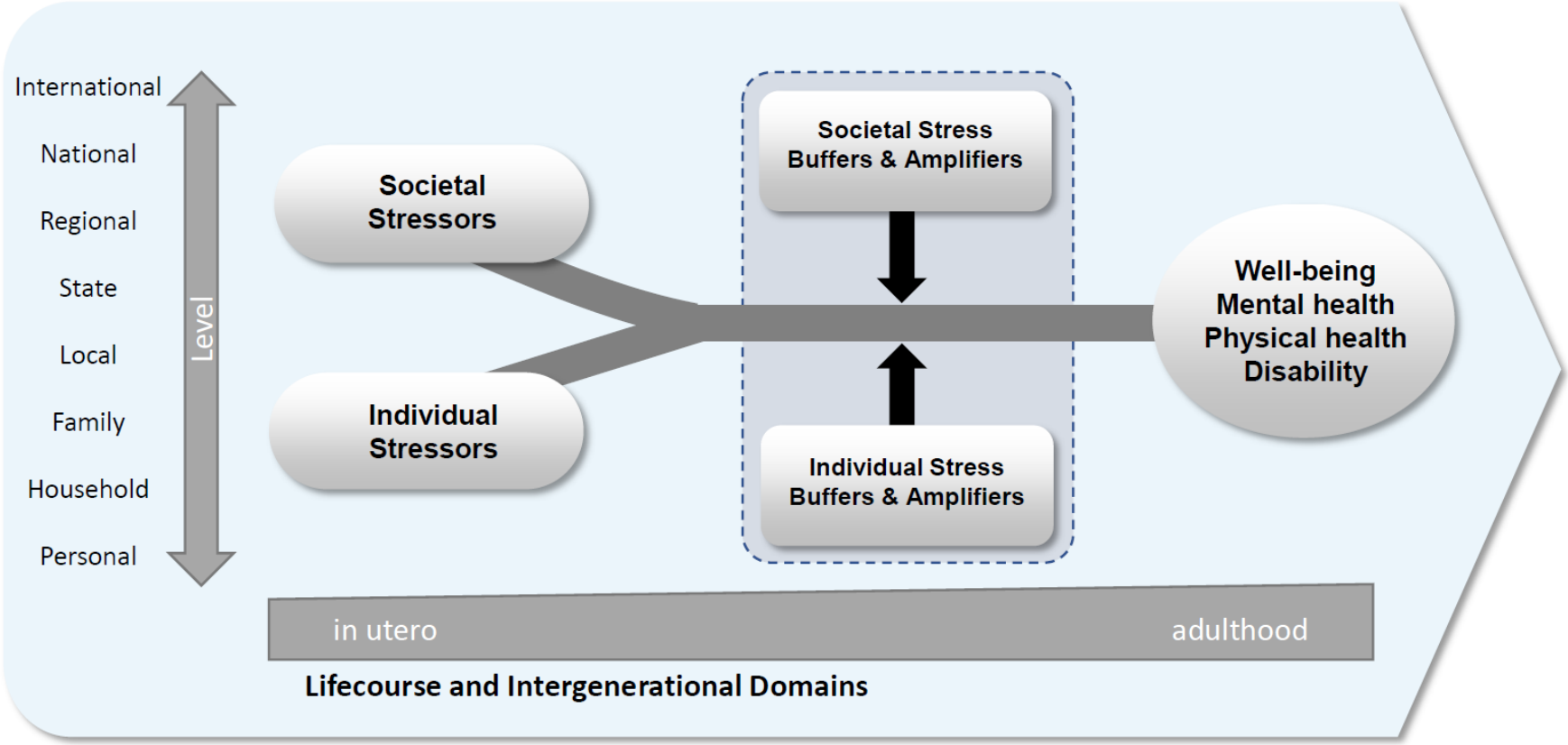
Overall Goal

- Produce practical, actionable information for improving population health, well-being, and health equity

Aims

- Discover the ways that stressors over the life course at the personal, interpersonal, intergenerational, and societal levels contribute to health and wellbeing
- Identify factors that mitigate or amplify how stressors influence health and wellbeing

NJ Population Health Cohort Study Conceptual Framework
Adapted Ecosocial Model of Stressors and Health & Wellbeing



Adapted from: Krieger, N. (2001). Theories for social epidemiology in the 21st century: an ecosocial perspective. *International journal of epidemiology, 30(4), 668-677.* Krieger, N. (2008). *Proximal, distal, and the politics of causation: what's level got to do with it?. American journal of public health, 98(2), 221-230.* Pearlin, LI. (1989). The Sociological Study of Stress. *Journal of Health and Social Behavior* 30(3):241-256. Alvidrez J, Castille D, Laude-Sharp M, Rosario A, Tabor D. (2019). The National Institute on Minority Health and Health Disparities Research Framework. *American Journal of Public Health*. 109(S1):S16-20.

Study Sample

New Jersey household population (n≈**10,000**) aged 14 and older

- **Probability sample** (n≈6,000)
  - Four-stage, area-probability sample
  - Oversample multi-generational, minority, and low-income families
  - Multiple individuals across generations in sampled families
- **Immigrant samples** (n≈4,000)
  - Recruited via respondent driven sampling
  - Focal groups: Chinese, Dominican, Filipino, Haitian, Indian, Jamaican, Korean, Mexican, Nigerian, and Refugee/Asylee
  - Multiple individuals in sampled families

Baseline Round Data Sources

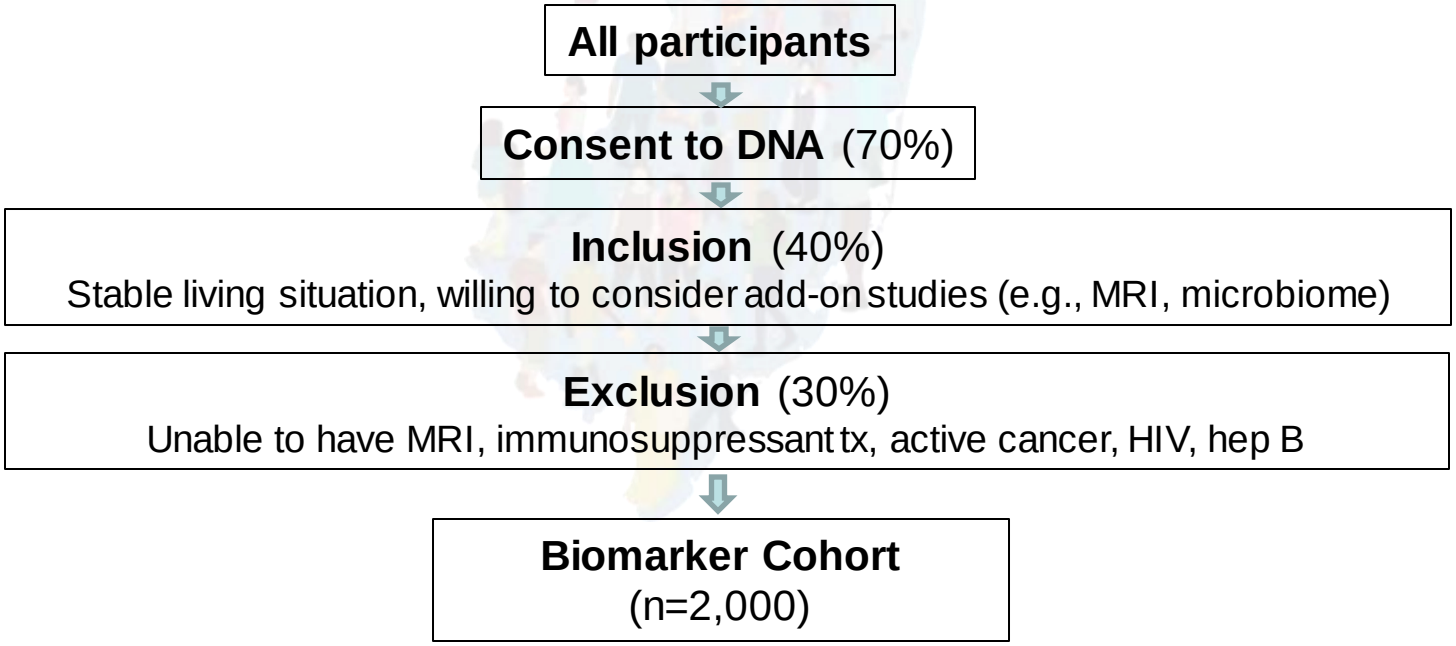
- **In-depth interviews** (n≈10,000)
  - Telephone, Zoom or in person
  - Cognitive testing in person (age 50+)
  - Height, weight, waist, hip in person
- **Activity and movement** (n≈1,000)
  - Actigraphy watch
  - GPS device
- **Biological markers**
  - Saliva (all consenting participants)
  - Blood draw (n≈2,000)
  - Both will be banked
- **Secondary data linkages**
  - Individual-level (all consenting participants)
  - Area/neighborhood-level (all participants)

Actigraphy & Movement

- N=1,000 oversample youth/young adults
- Two-week data collection from consenting participants
- Actigraph CentrePoint watches
  - Raw tri-axial accelerometer data + Actigraph activity counts
  - Physical activity (i.e., MVPA, Bouts, Steps, Wear Time)
  - Sleep (i.e., Total sleep time, Awakenings, Wake After Sleep Onset, Sleep Efficiency)
- Study cell phone
  - GPS at 15 second intervals (latitude, longitude, altitude, speed, bearing, timestamp)
  - Daily sleep and movement questionnaire

Biomarkers

- Salivary DNA collected from all consenting participants
  - Genotype ~800,000 single nucleotide polymorphisms (SNPs)
- Fasting plasma collected for subgroup for biomarker analysis
  - Inflammatory cytokines and their soluble receptors
  - Alzheimer's biomarker (p-Tau_{181})



Data Linkages

Respondent-Level

Individual consent
Multiple DUAs
2017-forward

Area-Level

Geocoded location
Details under development

Respondent-Level Data	Source (pending DUAs)
Medicare & Medicaid Claims (US)	CMS/ResDAC
Commercial Insurance Claims (NJ)	Horizon BCBS, others TBD
All-payer NJ hospital discharge data (inpatient, ED)	iPHD
Ambulatory care electronic health records (NJ)	RWJBH, others TBD
Social services enrollment and benefits (SNAP, TANF, General Assistance, Emergency Assistance) (NJ)	NJ Dept. Human Services
Registry data (COVID-19, Cancer) (NJ)	iPHD, DOH/CINJ
Vital records (NJ, US)	NDI, iPHD

iPHD = NJ Integrated Population Health Data Project (https://iphd.rutgers.edu/)

Measurement Domains

Health and Well-Being

- **Well-Being** – General well-being, life-satisfaction and meaning, QoL
- **Mental health** – Perceived stress, loneliness, depressive and anxiety symptoms, optimism, rumination, suicide screener
- **Physical health** – Self-assessed health, pain, medical conditions, BMI & hip/waist measures, physical performance
- **Cognition** – General cognition, memory, executive function, attention, language, visuospatial
- **Physical disability** – Mobility, self-care, getting along, life activities, participation
- **Morbidity and mortality**

Assessed using secondary, linked data

Measurement Domains

Stressors

- **Personal & interpersonal stressors**
  - "Objective" stressors – ACEs, criminal justice history, elder mistreatment, intimate partner violence, bullying, grandparent burden and caregiving, reasons for immigration, COVID-19, unemployment and wage history, etc.
  - Perceived discrimination
- **Socio-political and societal stressors**
  - Contemporary stressors – Social media, climate, economic inequality, political turmoil, race relations, immigration, gun violence
  - Social determinants of health – Housing insecurity & quality, food insecurity, utility insecurity, financial/material hardship
  - Environmental, neighborhood – Pollution, traffic, safety, etc.

Assessed using secondary, linked data

Measurement Domains

Buffers, Amplifiers, and Other Variables

- **Biomarkers**
- **Psychological traits** – Personality, optimism, rumination, existential struggle, meaning
- **Relationships & networks** – family relationships, social support from family and friends, civic engagement, caregiving
- **Health & related behaviors** – Health risk attitudes, substance (alcohol, nicotine, opioid, cannabis) dependence screeners, religious practice, civic engagement, volunteerism, following news, physical activity, sleep
- **Healthcare access & use** – Usual place of care; barriers to physical, mental, Rx, dental care; vaccination; preventive screenings; healthcare utilization (NJ, US, international), diagnostic history, care seeking attitudes

Assessed in biomarkers
Assessed using actigraphy and GPS
Assessed using secondary, linked data

Measurement Domains

Buffers, Amplifiers, and Other Variables *(continued)*

Socio-demographics & immigration – Race/ethnicity, sex, age, SOGIE, language proficiency, nativity, citizenship, refugee/asylee status, reasons for immigration

SES – Education, employment, employment/wage history, income, assets, health insurance coverage, own/rent home

Assessed using secondary, linked data

NJ Cohort Data Collection Timeline

- **Probability sample conducted in 3 self-representing "replicates"**
  - Replicate 1 – in the field, expected completion early 2024
  - Replicates 2 & 3 conducted over about 7 months each (complete data late 2025)
- **Immigrant samples**
  - Underway
- **Biomarkers**
  - Silvia collection in all replicates
  - Blood pilot study near completion
  - Collect n=2,000 samples in replicates 2 & 3
- **Actigraphy & GPS**
  - Underway
- **Secondary data**
  - Person-level: Informed consent for all participations, data source applications & negotiations underway
  - Geographic-level: develop as needed

Engagement Plan

- **Community Advisory Board**
  - General and immigrant group-specific outreach and recruitment
  - Community engagement and outreach strategies
  - Analysis and dissemination priorities
- **Community Outreach**
  - Events and network building
- **Scientific Advisory Committee**
  - Scientific and sustainability advice
- **Additional Outreach**
  - NIH officials & other key national audiences
  - New Jersey elected officials and policy stakeholders

Team Science Approach to Sustainability

- **RWJF/RBHS funding**
  - Covers roughly 80% of expenses for the baseline data collection and initial analysis
  - Commitment ends with baseline data collection
- **Team science strategy to fill gaps in Cohort infrastructure and funding for future rounds**
  - Seek NIH infrastructure support
  - Identify **experienced R01 investigators** with related interests to lead R01 proposals
    - Target NIH (NIA, NICHD, NIMH, NIMHD, NHLBI, NIDDK, etc.) and other sources
    - Possibly add selected interview items in replicates 2 or 3
    - Provide data for preliminary studies using replicate 1 data
    - Portion of funding to support Cohort infrastructure
  - Offer support to **early-stage and new investigators**
    - Pilot grants (if funds are available)
    - Waive requirements to cover Cohort infrastructure costs
- **Outreach to New Jersey stakeholders and other possible funders.**

Team Science Approach to Sustainability

- **Current discussions with R01-ready investigators** (preliminary)
  - Association of perceived discrimination and mental health among African American and Black immigrant populations
  - Patterns of tobacco use among US born and immigrant groups
  - Variations in risk related to climate events (e.g., excessive heat)
  - Genetic and social correlates of substance use and dependency
  - Social media, sleep, and suicide risk in adolescents and young adults
- **Expectations for projects using Cohort data and infrastructure**
  - Cover all incremental costs (e.g., additional testing of bio samples, additional interviews or interview questions)
  - Support for Cohort infrastructure & additional rounds of data collection (e.g., data retrieval fee, support for Cohort investigator or staff, in-kind contributions)
  - Shared governance for use of data collected under collaborative awards.

Thank You

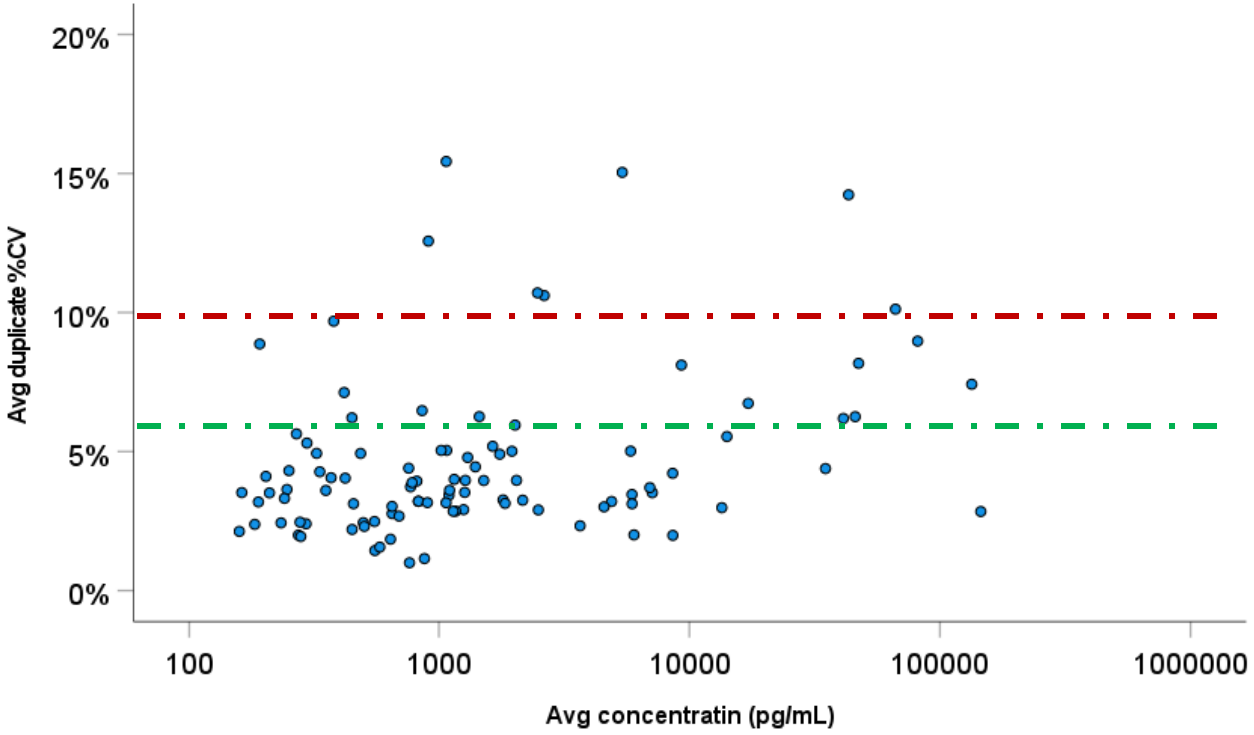
Questions?

Technical qualification in NJ Cohort Biomarkers

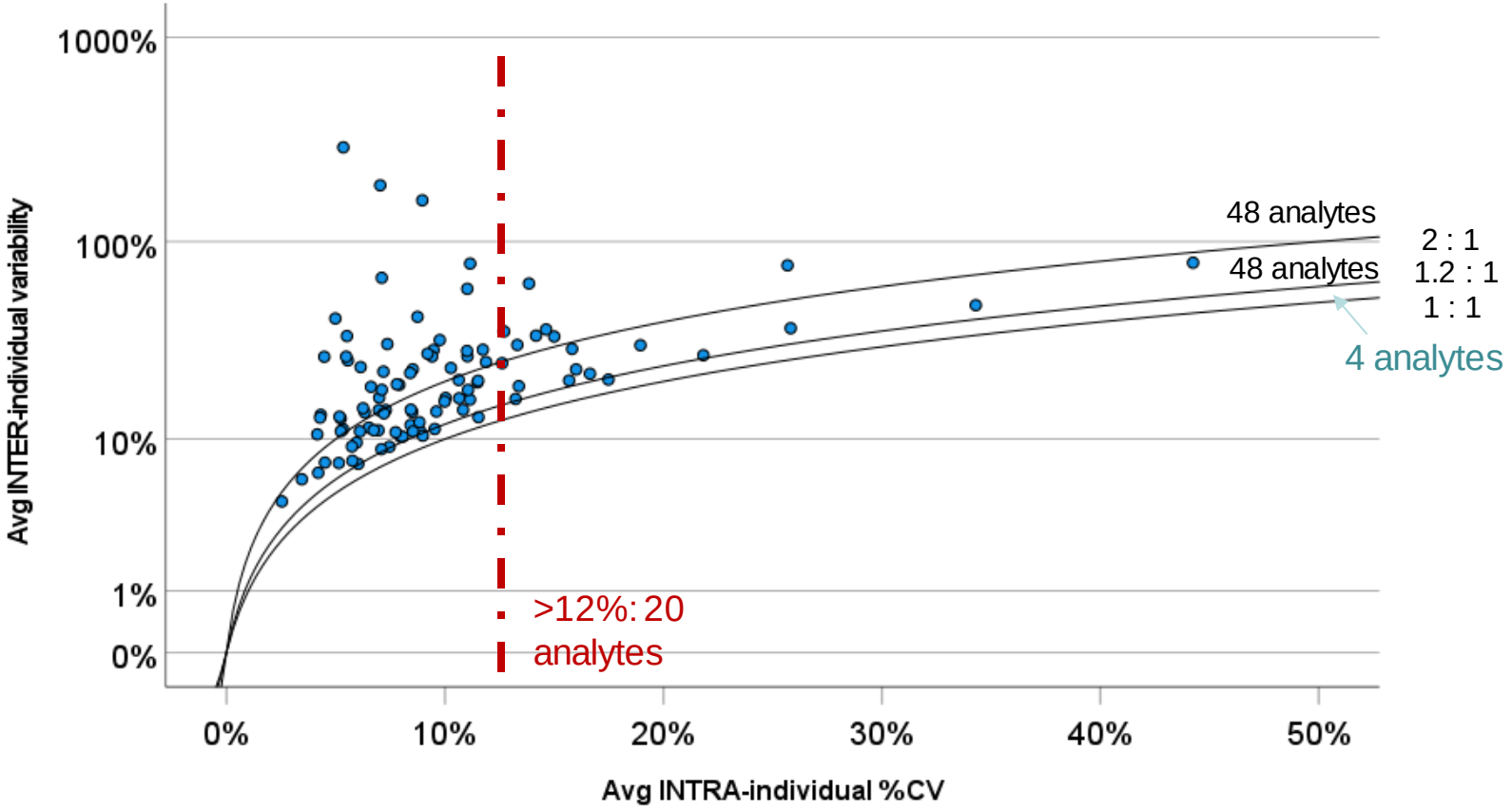
1. Intermediate precision
   - Technical duplicates
   - Intra-individual variability (over 4 weeks)
2. Biological variability
3. Effects of fasting
4. Effects of processing delay
5. Effects of repeated freeze-thawing

Technical replicates

(adjacent aliquots, blinded testing)



Biological variability



Probability Sample

Objectives

- Represent New Jersey overall and large regions of the state
- Over-sample immigrants, multi-generational families
- Ensure adequate samples of racial/ethnic minority and low-income groups
- Efficient in-person data collection

Developed collaboration with RTI International

- Sample design
- Address based sample (ABS)
- Calculation of sample weights

Probability Sample

Four-stage design

- Stage 1: Primary Sampling Units (PSU)
  - 30 PSUs drawn from 73 Public Use Microdata Areas (PUMS)
  - Oversample high-immigrant areas
  - Fielded in three replicates (8, 10, 12 PSUs, respectively)
- Stage 2: Secondary Sampling Units (SSU)
  - SSUs built from 6,320 NJ Census Block Groups, some combined
  - 690 SSUs selected, 23 per PSU
  - Oversample high-immigrant areas
- Stage 3: Housing Units (HU)
  - Address based sample (ABS)
  - 138,000 HUs, 200 housing units per SSU
  - Model-based oversample of multigenerational households
    - Trained on prior RTI studies
    - 74% correctly predicted

Probability Sample

Four-stage design

- Stage 4: Within Household (HH) Selection
  - Enumerate families, family members age 14+
  - Randomly select one family in multi-family HHs
  - Within family, select one person per generation
    - Teen (14-17)
    - Young adults (18-39)
    - Middle aged (40-59)
    - Older (60+)
  - Eligible immigrant groups
    - Respondent-driven sample "seeds"
    - Select all other family members

Selected Milestones & Timeline (updated Jan 2023)

2023

- Continue community, policy, and scientific engagement activities
- Commence RDS recruitment
- Complete replicate 1 data collection (interviews, actigraphy/GPS, DNA)
- Complete biomarker pilot study
- Continue secondary data linkage implementation (person-level, geographic)
- Begin preliminary analyses in replicate 1 data
- Prepare and submit initial NIH and other grant proposals
- Produce weighted dataset and initiate publication and community-oriented dissemination
- Consider replicate 2 instrument additions/revisions
- Launch replicate 2 data collection

Selected Milestones & Timeline (updated Jan 2023)

2024

- Continue community, policy, and scientific engagement activities
- Complete replicate 2 data collection (all components)
- Launch and complete replicate 3 data collection (all components)
- Complete RDS data collection
- Continue secondary data linkages
- Continue development and submission of NIH and other grant proposals
- Prepare replicate 2 weights
- Continue publication/dissemination

2025-2026

- Continue community, policy, and scientific engagement activities
- Continue development and submission of NIH and other grant proposals
- Conduct competitive Rutgers pilot grant process