

# LONGITUDINAL AGING STUDY IN INDIA, LASI

2019 International Biomarker  
Network Meeting  
Jinkook Lee, USC

# LASI, LONGITUDINAL AGING STUDY IN INDIA

An ongoing cohort study of **72,000** older adults in India

- Co-funded by the US National Institute on Aging, the Government of India (Ministry of Health & Social Welfare), and UNFPA

## Sample

- 45+ older adults & spouses at all ages
- Representative of the nation as well as 30 states and 6 union territories
- Over-sample of 60+ (1/3 of the sample is 60+)
- Over-sample of 4 metropolitan cities

PI: David Bloom, P. Arokiasamy, Jinkook Lee

Biological data personnel: Perry Hu, Sarang Pedgaonkar

# LASI

## Household Interview

- Household Roster
- Housing & Environment
- Consumption, Asset, Income
- Health Insurance

## Individual Interview

- Demographics
- Work, Retirement & Pension
- Health & Cognition
- Health Care Utilization
- Family & Social Network
- Experimental Modules: Expectations, Vignettes, Time Use & Wellbeing, Social Connectedness

## Biomarkers

- Anthropometrics
- Blood pressure & pulse
- Timed walk, balance test, grip strength
- Vision test, spirometry
- Dried blood specimen

## Community Interview

- Infrastructure and public facilities
- Health care facilities
- History of environmental shocks
- Prices of rationed goods

# BIOMARKERS

What's funded:

DBS assay on Hb, HbA1c, CRP & EBV antibody levels for a sub-sample

Pilot study on Vitamin D assay from DBS

Pilot study on whole genome sequencing from DBS

Proposed biomarkers:

Cystatin C, CMV antibody, IL-6, Vitamin D, blood lead levels all from DBS

# LASI-DAD, DIAGNOSTIC ASSESSMENT OF DEMENTIA

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# LASI – DAD

An in-depth study of late-life cognition and dementia using hospitals as phenotyping centers

A sub-sample of 3,200 respondents aged 60 and older from a nationally representative study, **the Longitudinal Aging Study in India (LASI)**

Administers an **enriched** Harmonized Cognitive Aging Project (HCAP) protocol

PI: Jinkook Lee

Co-PI: A.B. Dey

Biological data personnel: Perry Hu, Pranali Khobragade, Joyita Banerjee



# SAMPLING STRATEGY

Two-stage stratified random sampling with oversampling of those at high risk of cognitive impairment

1. Stratify the entire LASI sample based on risk of cognitive impairment and state of residence

- Cognitive impairment risk is determined based on the performance of memory and non-memory domain cognitive tests, overall test performance, refusal or inability to participate in the cognitive tests, and proxy interview in the main LASI

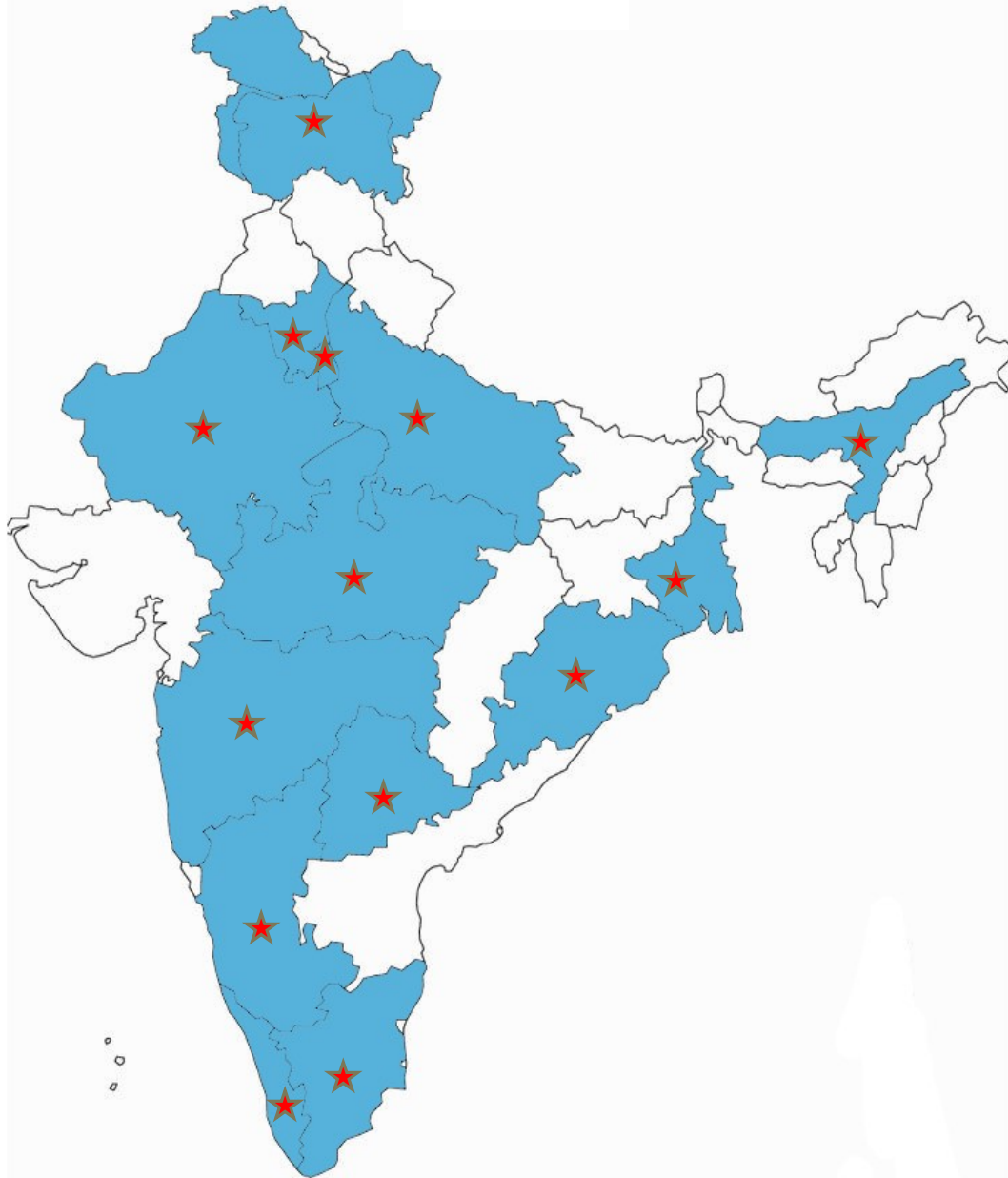
2. Randomly draw a sample with about equal numbers of those at high risk and not high risk of cognitive impairment

- The sample size for each state is set in consideration of the main LASI sample size

Released in batches, after 2-month interval from the main LASI; an average interval between LASI and DAD is about 4 months

Response rate = 86.9%

Target sample size 3,200 (As of Mar 17, 3,003 completed interviews)



## Collaborating Institutions across 14 states

Phase 1	Phase 2
Delhi All India Institute of Medical Sciences, Delhi	Jammu & Kashmir Sher-i- Kashmir institute of Medical sciences, Srinagar
Rajasthan S. N. Medical College, Jodhpur	West Bengal Kolkata Medical College
Uttar Pradesh Banaras Hindu University	Assam Guwahati Medical College
Karnataka NIMHANS, Bangalore	Odisha AIIMS, Bhubaneshwar
Kerala Trivandrum Medical College, Trivandrum	Telangana Nizam's Institute of Medical Sciences, Hyderabad
Tamil Nadu Madras Medical College, Chennai	Maharashtra Grant Medical college, Mumbai
Haryana All India Institute of Medical Sciences, Delhi	Madhya Pradesh Gwalior Medical College, Gwalior





# SAMPLE CHARACTERISTICS

As of Mar 7, 2019

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Age	Male	Female	Overall
60-64	333	474	807
65-69	388	450	838
70-74	281	255	536
75-79	175	191	366
80+	178	189	367
Total	1355	1559	2914

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Education	Urban	Rural	Overall
Never attended school	668	704	1372
Less than primary to primary school	432	338	770
Middle school to higher secondary school	359	263	622
Diploma and certificate and above	84	66	150
Total	1543	1371	2914

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# BIOMARKER

17 ml VBS collected by phlebotomists at home and hospitals

Venous blood-based tests

- Complete blood cell counts, HbA1c, serum based assays, glucose, lipid panel, lipoprotein(a), proBNP, hsCRP, metabolic panel, including renal and liver functions, cystatin C, TSH, T3, T4, vitamin B12, folic acid, homocysteine, 25-hydroxyl-vitamin D

Whole blood repository (serum, plasma, buffy coat, dried blood spot)

Physical function (Timed up and go, 6-minute walk, hearing test), Mini Nutritional Assessment

Diet, spice use (medical use), polypharmacy (only phase 2)

# BIOMARKER (-CONTINUED)

## Genomics

- Whole Genome Sequencing validation study in partnership with Broad Institute and MedGenome
- **Global Screening Array** (Illumina Infinium GSA-24 v2.0 Beadchip, 640,000 genetic markers) for **N=1,010** (Phase 1 sample plus QC sample) in partnership with Kardia (UM), Moorjani (UC Berkley) and MedGenome
- **Whole Genome Sequencing** R01, in partnership with Kardia (MPI, UM), Moorjani (UC Berkley), Ganna (Broad), and Schellenberg (U Penn), pending

## Pollution

- **PM2.5** estimates from **satellite data**, **ground monitor data** from the GoI, 10x10m
- Currently, bringing geo-covariates including road patterns, typology, etc.

## MRI

- ADNI-3 protocol, including structural MRI and resting state fMRI
- 64 cases completed to date