LONGITUDINAL AGING STUDY IN INDIA – DIAGNOSTIC ASSESSMENT OF DEMENTIA, LASI-DAD

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OUTLINE

1. Introduction
2. Sampling strategy and response rate
3. Project protocol
4. Data release plan
5. Publications
6. Data download
7. Harmonized data files and codebook
8. Q&A

DIAGNOSTIC ASSESSMENT OF DEMENTIA FOR LASI

LASI – DAD

- An in-depth study of late-life cognition and dementia using hospitals as phenotyping centers
- A sub-sample of 4,000+ 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

LASI, LONGITUDINAL AGING STUDY IN INDIA

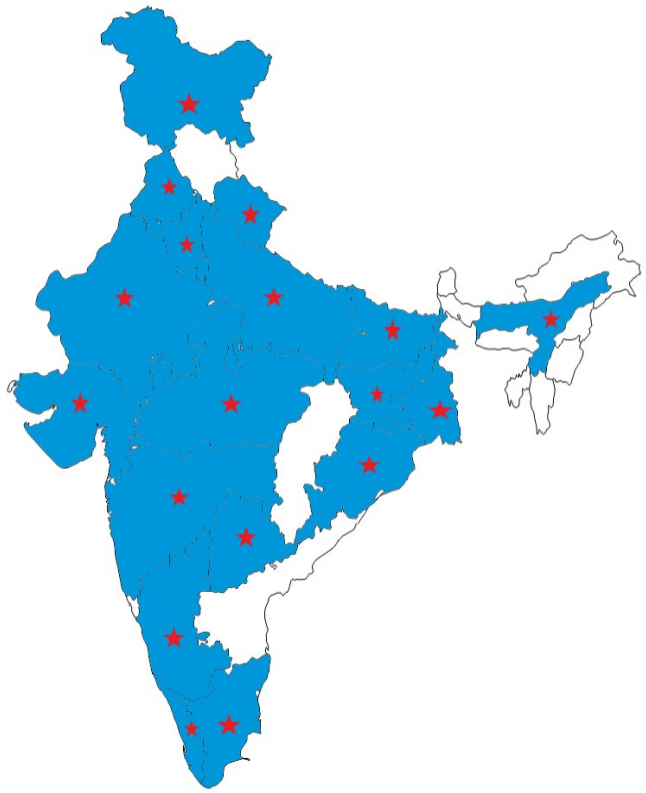
An ongoing cohort study of 72,000+ older adults in India

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

Sample

- 45+ aged older adults & spouses at all ages
- Representative of the nation as well as of 30 states and 6 union territories
- Over-sample of those aged 60+
- Over-sample of 4 metropolitan cities (New Delhi, Mumbai, Chennai, Kolkata)

LASI-DAD REPRESENTS 91.6% OF THE POPULATION IN INDIA



Phase 1	Phase 2	Phase 3
Delhi, Haryana All India Institute of Medical Sciences	Jammu & Kashmir Sher-i- Kashmir Institute of Medical Sciences, Srinagar	Gujarat Grant Medical College, Mumbai
Rajasthan S. N. Medical College, Jodhpur	West Bengal Kolkata Medical College	Bihar Indira Gandhi Institute of Medical Sciences, Patna
Uttar Pradesh Banaras Hindu University	Assam Guwahati Medical College	Jharkhand Indira Gandhi Institute of Medical Sciences, Patna
Karnataka NIMHANS, Bangalore	Odisha AIIMS, Bhubaneshwar	Uttarakhand All India Institute of Medical Sciences, Rishikesh
Kerala Trivandrum Medical College, Trivandrum	Telangana Nizam's Institute of Medical Sciences, Hyderabad	Punjab Government Medical College, Chandigarh
Tamil Nadu Madras Medical College, Chennai	Maharashtra Grant Medical College, Mumbai	Madhya Pradesh All India Institute of Medical Sciences

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 on 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 at 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 with LASI fieldwork progress; an average interval between LASI and DAD is about 6 months

Response rate = 82.9% (Phase 1+2 only)

Sample size = 3,224 (Phase 1+2 only)

We are currently in the Phase 3 fieldwork, which we plan to complete by Apr 15, 2020

IDENTIFYING HIGH RISK OF COGNITIVE IMPAIRMENT

Based on their relative rank in the total cognition score (except number series) within their age/education group (60-69/70+ & no school/some school), we divide them into 3 groups:

- High risk of cognitive impairment: the bottom tertile
- Low risk: the middle tertile
- Very low risk: the top tertile

We further identified high risk individuals based on the additional criteria that Drs. Ganguli and Saxton suggested:

- Bottom 15th percentile on word recall
- Bottom 15th percentile on cognition score (total cognition minus word recall)
- Top 15th percentile on number of missing cognitive tests
- Jorm IQ Code score of 3.9 or higher

RESPONSE RATES

%	PHASE 1+2	ALL	HIGH COGNITIVE IMPAIRMENT RISK	LOW COGNITIVE IMPAIRMENT RISK
ALL		82.9	82.8	82.9
AGE	60-64	83.2	82.3	83.9
	65-69	82.3	83.0	81.5
	70-74	82.8	82.3	83.2
	75+	83.2	83.5	82.7
SEX	Male	80.4	82.0	79.3
	Female	85.1	83.4	87.2
EDUCATION	No school	83.4	82.7	84.2
	Primary school or less	86.4	86.5	86.1
	Middle to secondary school	81.7	79.5	83.0
	Higher secondary school+	72.6	70.0	73.6
URBANICITY	Urban	74.8	73.1	76.2
	Rural	89.4	89.7	89.1
STATES	Assam	97.6	96.3	99.0
	Delhi/Haryana	66.9	65.4	68.5
	Jammu & Kashmir	82.6	85.2	80.2
	Karnataka	83.4	82.4	84.3
	Kerala	89.5	88.0	91.0
	Madhya Pradesh	94.3	91.8	96.5
	Maharashtra	79.6	78.4	80.7
	Orissa	89.7	90.6	88.7
	Rajasthan	73.1	70.7	75.4
	Tamil Nadu	91.7	94.2	89.1
	Telangana	81.3	84.7	78.1
	Uttar Pradesh	81.8	82.3	81.4
	West Bengal	88.2	90.5	85.9

COGNITIVE TESTS

1. Hindi Mental State Exam
2. HRS TICS
3. Word learning: immediate recall
4. Digital span forward and backward
5. Symbol cancellation
6. Word list delayed recall
7. Word list recognition
8. Logical memory: immediate recall
9. Constructional praxis: copy
10. Logical memory delayed recall
11. Logical memory recognition
12. Retrieval fluency
13. Constructional praxis recall
14. Backward count (Phase 1 only)
15. Hand sequencing, token tests (Phase 2 & 3 only)
16. Judgment, similarities & differences tests (Phase 2 & 3 only)
17. Serial 7s
18. CSI-D
19. Raven's matrices
20. Go-No Go

RED font indicates a modification from the HCAP protocol

INFORMANT REPORT

Informant demographics

JORM – IQCODE

Blessed Part 2

Activities

10-66

Blessed Part 1

- Equivalent to the HRS-HCAP protocol

CLINICAL DIAGNOSIS

- We developed an online clinical consensus diagnosis approach and validated it against an in-person consensus diagnosis using Clinical Dementia Ratings (CDR) during Phase 1 data collection.
- We completed CDR for all Phase 2 cases (N=1,704).
- We are in the process of clinical consensus diagnosis for Phase 3 cases.
- We are also in the process of developing a CDR prediction model for Phase 1 cases.

EPIDEMIOLOGICAL DATA

Geriatric Assessment

- Anthropometry, blood pressure, performance tests (timed up-and-go, 6-minute walk, hearing)
- ADL, IADL, CESD, Anxiety, Mini Nutritional Assessment

Cardiovascular Risk Factors

- Self-report of stroke, heart disease, diabetes, hypertension
- Measured BP, BMI, waist-to-hip ratio
- HbA1c, HDL, LDL, and total cholesterol, triglycerides, lipoprotein(a), proBNP, hsCRP, homocysteine

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

DATA RELEASE

- Early data made available for "Advanced Psychometrics Methods in Cognitive Aging Research Workshop," August 18 – 23, 2019
  - Phase 1+2 cognitive test results and informant reports were made available
  - Missing data were not imputed
- Public data release on Dec 18, 2019
  - Phase 1+2 data, including cognitive test results, informant reports, geriatric assessment, and VBS assays
  - Missing cognitive data were imputed
- Final data release planned in Dec, 2020
  - Will include Phase 3 data, clinical diagnosis of dementia status, and data on polypharmacy and micronutrients

PUBLICATIONS

1. Published: Lee, J., J. Banerjee, P. Khobragade, M. Angrisani, A.B. Dey. "Protocol for a prospective cohort study of late-life cognition and dementia in India: the LASI-DAD Study," *British Medical Journal Open*, 2019, 9: e030300. Doi:10.1136/bmjopen-2019-030300.
2. Accepted: Banerjee, J., U. Jain, P. Khobragade, A. Weerman, P. Hu et al. Methodological considerations in designing and implementing the Harmonized Diagnostic Assessment of Dementia for Longitudinal Aging Study in India (LASI-DAD), *Biodemography and Social Epidemiology*
3. Accepted: Lee, J., P.Y. Khobragade, J. Banerjee, S. Chien, M. Angrisani, P. Arokiasamy, D.E. Bloom, A.B. Dey. "Design and methodology of the Longitudinal Aging Study in India – Diagnostic Assessment of Dementia (LASI-DAD)," *Journal of American Geriatrics Society*.
4. Accepted: Lee, J., M. Ganguli, A. Weerman, S. Chien, D.Y. Lee, M. Varghese, A.B. Dey. Online clinical consensus diagnosis of dementia: development and validation, *JAGS*

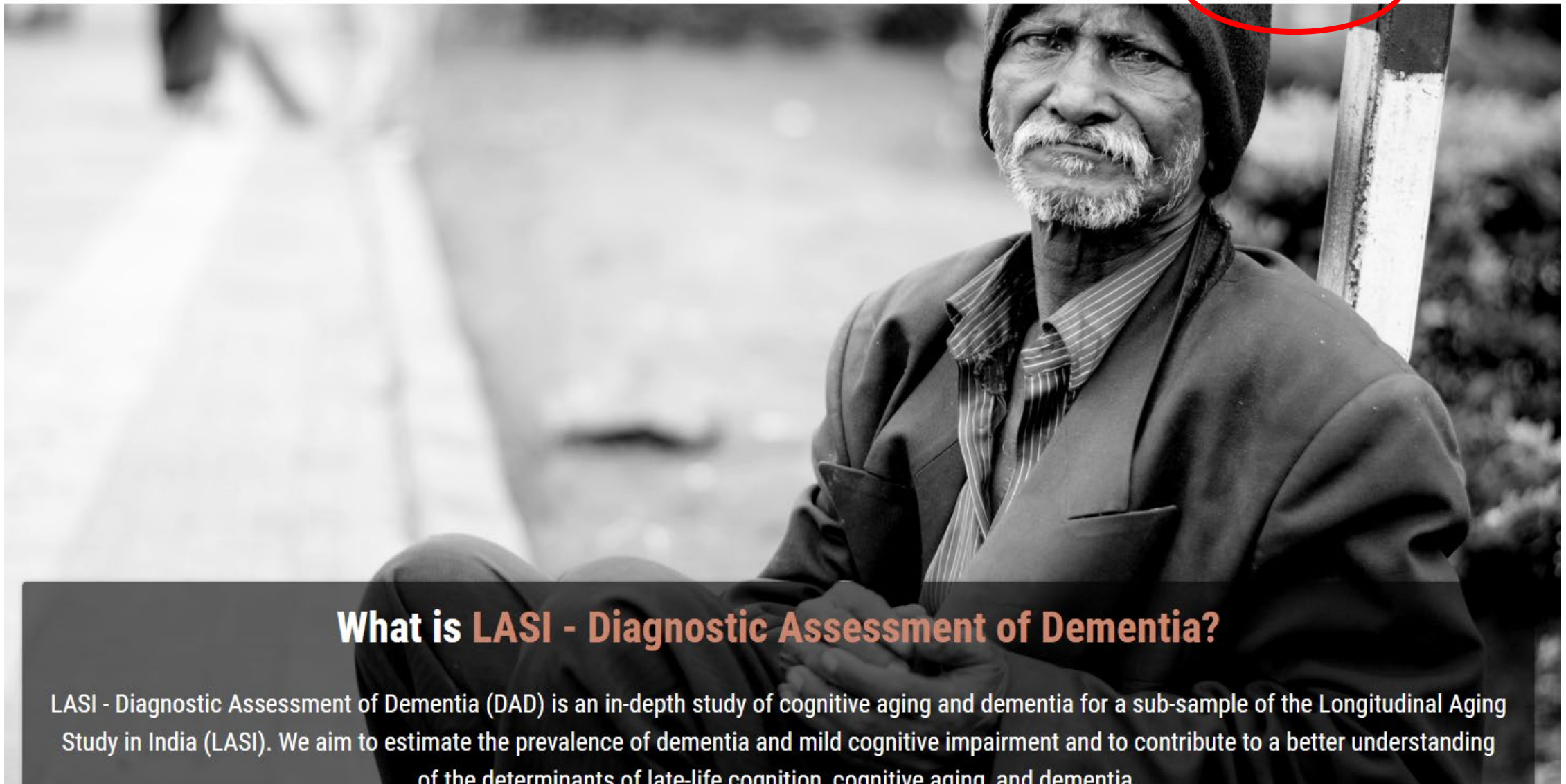
DATA DOWNLOAD

Lasi-dad.org

lasi-dad.org

LASI - Diagnostic Assessment of Dementia

ABOUT | STUDY DESIGN | NEWS & EVENTS | RESEARCH TEAM | CONTACT | DATA | LOGIN



What is LASI - Diagnostic Assessment of Dementia?

LASI - Diagnostic Assessment of Dementia (DAD) is an in-depth study of cognitive aging and dementia for a sub-sample of the Longitudinal Aging Study in India (LASI). We aim to estimate the prevalence of dementia and mild cognitive impairment and to contribute to a better understanding of the determinants of late-life cognition, cognitive aging, and dementia.

Data Download

The **LASI-DAD Early Release Version A** data is available on Gateway to Global Aging Data website. The file contains phase 1 and phase 2 data only. The phase 3 data is still being collected and we expected the dataset to be released in fall 2020.

Raw LASI-DAD

Dec 17, 2019

includes data & codebooks for:

- Cognition tests (View codebook)
- Informant reports (View codebook)
- Geriatric assessments (View codebook)
- Venous blood specimens (View codebook)

Harmonized LASI-DAD

Dec 17, 2019

includes:

- Harmonized data
- Codebook (View codebook)
- Stata creation code

DATA ACCESS INSTRUCTIONS:

How to Apply:

1. Create an account on the Gateway to Global Aging Data website, if you don't already have one.
2. Download and complete the Sensitive Data Access Use Agreement. While filling this form, please use the *same email address* that you provided for registration above.
3. Submit the Sensitive Data Order Form.

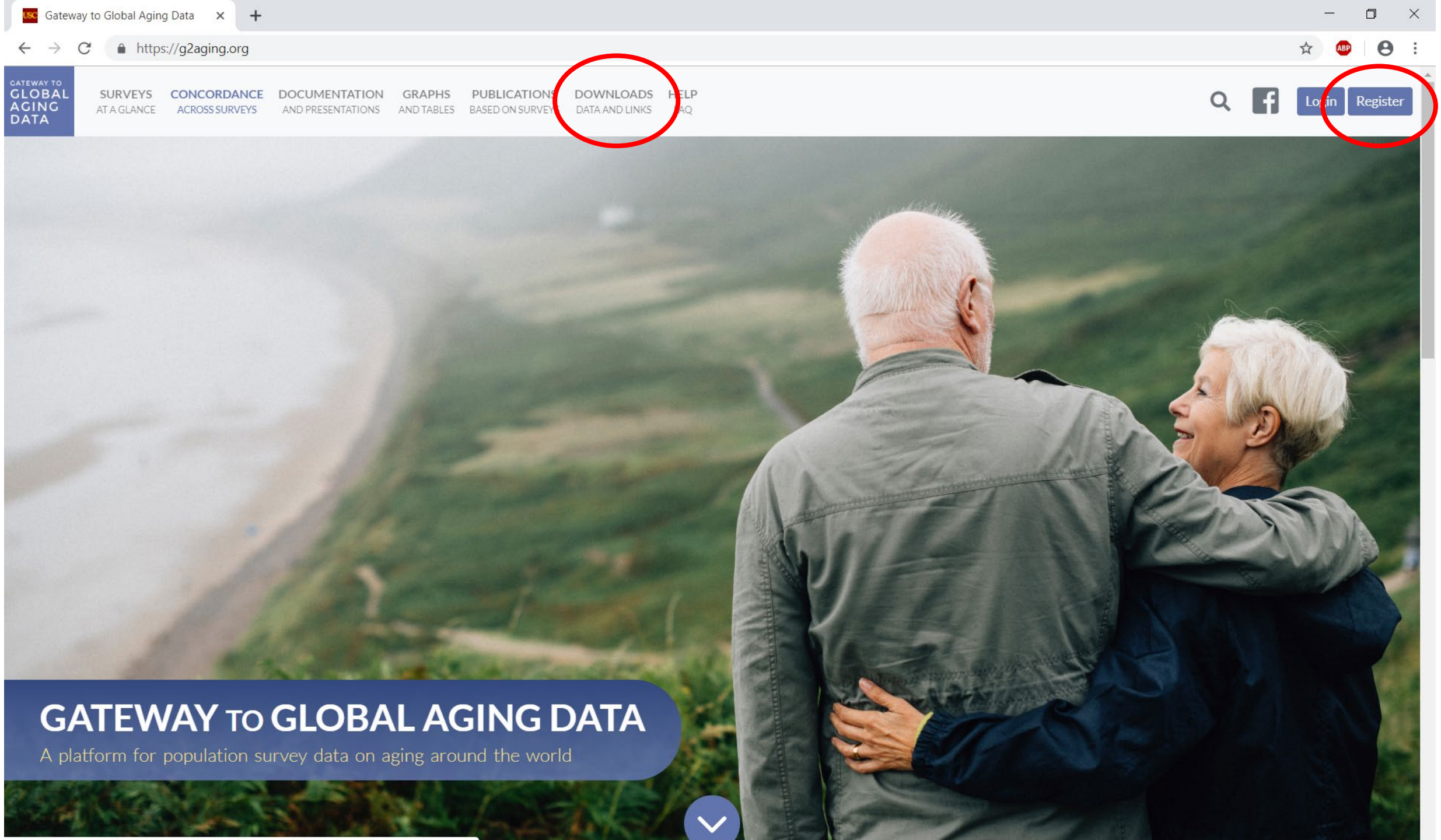
The Approval Process:

1. The LASI-DAD team will review your request and verify your identity and institutional affiliation. Once this authentication process has been completed to our satisfaction, we will authorize access to the desired data set. We will communicate with you at the email address that you provided when you registered with the Gateway to Global Aging Data website.

Download Instructions:

1. Once approved, please login at the Gateway to Global Aging Data website.
2. Under the Downloads: Data and Links page, click **LASI-DAD** under **HCAP** tab.
3. The download links on the page will be activated for approved users.

Please contact us at help@g2aging.org if you have any questions.


Gateway to Global Aging Data
https://g2aging.org
GATEWAY TO GLOBAL AGING DATA
SURVEYS AT A GLANCE
CONCORDANCE ACROSS SURVEYS
DOCUMENTATION AND PRESENTATIONS
GRAPHS AND TABLES
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A platform for population survey data on aging around the world

Downloads

Please cite all information retrieved from the Gateway as follows: Gateway to Global Aging Data, Produced by the Program on Global Aging, Health & Policy, University of Southern California with funding from the National Institute on Aging (R01 AG030153)

To register and access data for any of the HRS-family studies, click here

Core Interview Data | End of Life Data | Life History Data | **Harmonized Cognitive Assessment Protocol**

	LASI - DAD	HRS - HCAP	Mex - Cog
	India	United States	Mexico
Study Details	LASI-DAD	HRS-HCAP	Mex-Cog
Download Data Package	LASI-DAD	HRS-HCAP	Mex-Cog

* For information about obtaining Harmonized Data in formats other than Stata, click here.

WHAT'S AVAILABLE

- Raw LASI-DAD data and documentations
  - Cognition tests
  - Informant reports
  - Geriatric assessments
  - Venous blood assays
- Harmonized LASI-DAD
  - Harmonized data
  - Codebook
  - Stata creation code

HARMONIZED DATA FILES

- User-friendly data file that contains the summary measures
- Variables are defined as similarly as possible to across HCAP studies
- Country specific variable name: e.g. r1educ_l – respondent's education background of wave 1 LASI-DAD, with different response scale

HARMONIZED CODEBOOKS

Includes brief overview of statistics for each variable

Date Naming

Wave	Variable	Label	Type
1	R1MO	r1mo:w1 R cognition date naming-month(0-1)	Categ
1	R1FMO	r1fmo:impflag w1 r whether imputed value	Categ
1	R1YR	r1yr:w1 R cognition date naming-year(0-1)	Categ
1	R1FYR	r1fyr:impflag w1 r whether imputed value	Categ
1	R1DW	r1dw:w1 R cognition date naming-day of week(0-1)	Categ
1	R1FDW	r1fdw:impflag w1 r whether imputed value	Categ
1	R1SEASON	r1season:w1 R cognition date naming-season(0-1)	Categ
1	R1FSEASON	r1fseason:impflag w1 r whether imputed value	Categ
1	R1DATE	r1date:w1 R cognition date naming-date(0-1)	Categ
1	R1FDATE	r1fdate:impflag w1 r whether imputed value	Categ
1	R1ORIENT_T5	r1orient_t5:w1 R orientation to time(0-5)	Categ
1	R1ORIENT_T4	r1orient_t4:w1 R orientation to time(0-4)- comparable w LASI	Categ

HARMONIZED CODEBOOKS

Includes brief overview of statistics for each variable

Descriptive Statistics

Variable	N	Mean	Std Dev	Minimum	Maximum
R1MO	3224	0.82	0.38	0.00	1.00
R1FMO	3224	0.20	0.65	0.00	4.00
R1YR	3224	0.49	0.50	0.00	1.00
R1FYR	3224	0.61	1.04	0.00	4.00
R1DW	3224	0.83	0.37	0.00	1.00
R1FDW	3224	0.18	0.69	0.00	4.00
R1SEASON	3224	0.83	0.37	0.00	1.00
R1FSEASON	3224	0.14	0.53	0.00	4.00
R1DATE	3224	0.64	0.48	0.00	1.00
R1FDATE	3224	0.36	0.83	0.00	4.00
R1ORIENT_T5	3224	3.62	1.46	0.00	5.00
R1ORIENT_T4	3224	2.79	1.28	0.00	4.00

HARMONIZED CODEBOOKS

Categorical Variable Codes

Value	R1MO
0.Incorrect	572
1.Correct	2652

Value	R1FMO
0.Not imputed	2833
1.Dont know	273
2.Missing	2
3.Not Assessed	91
4.Refused	25

Value	R1YR
0.Incorrect	1638
1.Correct	1586

Value	R1FYR
0.Not imputed	2117
1.Dont know	687
2.Missing	2
3.Not Assessed	388
4.Refused	30

Value	R1DW
0.Incorrect	540
1.Correct	2684

Value	R1FDW
0.Not imputed	2952
1.Dont know	123
2.Missing	2
3.Not Assessed	122
4.Refused	25

HARMONIZED CODEBOOKS

Details variable creation and any assumptions made in the creation

How Constructed

The following variables indicate whether the respondent was able to report today's date correctly.

RwMO indicates whether a respondent was able to report the month correctly. RwYR indicates whether a respondent was able to report the year correctly. RwDW indicates whether a respondent was able to report the day of the week correctly. RwSEASON indicates whether a respondent was able to report the season of the year correctly. RwDATE indicates whether a respondent was able to report the date correctly.

RwMO, RwYR, RwDW, RwSEASON, and RwDATE are coded as 1 if the respondent correctly reports the value. RwMO, RwYR, RwDW, RwSEASON, and RwDATE are coded as 0 if the respondent incorrectly reports the value. Don't know responses are coded as special missing (.d). Refused responses are coded as special missing codes (.r). Other missing is assigned special missing (.m). "Not Assessed" responses are coded as special missing (.n). "Not assessed" is assigned when the test was not administered due to a respondent's physical disability or technical issues.

RwORIENT_T5 is the summary measure for RwYR, RwSEASON, RwDATE, RwDW, and RwMO ranging from 0 to 5. 5 indicates all correct answers. If RwYR, RwSEASON, RwDATE, RwDW, and RwMO are assigned special missing (.d), (.n), (.r), or (.m), RwORIENT_T5 is assigned special missing (.d), (.n), (.r), or (.m), respectively.

HARMONIZED CODEBOOKS

Highlights any differences with HRS HCAP and LASI main study

Cross Wave Differences in DAD

No differences known.

Differences with HRS HCAP

No differences known.

Differences with Harmonized LASI

In the Harmonized LASI, only 4 questions were asked: day of month, month, year, and day of week (RwDW, RwMO, RwYR, and RwDW). In DAD, there are 5 questions: day of month, month, year, date, and season (RwDW, RwMO, RwYR, RwDATE, and RwSEASON).

HARMONIZED CODEBOOKS

Lists all the variables from the originating dataset used in the creation of the variable

DAD Variables Used

```
Wave 1 Cog:
    MMSE102_YEAR            correct year
    MMSE103_SEASON          current season of the year--correct
    MMSE104_DATE            date correct
    MMSE105_DAY             current day of the week--correct
    MMSE106_MONTH           current month--correct
```

COMING SOON

- HRS HCAP Harmonized data and codebook
- Mex-Cog Harmonized data and codebook
- Cross-walk comparison table for LASI-DAD, HRS HCAP, and Mex-Cog
- Metadata information available on Gateway website
- Completed data for LASI-DAD including the phase 3 data

Q & A

Visit us at:

lasi-dad.org

g2aging.org

For any questions, please email:

help@lasi-dad.org