HHS Public Access

Author manuscript

J Am Geriatr Soc. Author manuscript; available in PMC 2021 September 28.

Published in final edited form as:

J Am Geriatr Soc. 2020 August ; 68(Suppl 3): S1–S2. doi:10.1111/jgs.16733.

New Insights and Knowledge on Cognition and Dementia from Population-Based Cohort of Older Adults in India

Rose Anne Kenny, MD

Department of Medical Gerontology, Trinity College, Dublin, Ireland; Mercer's Institute for Successful Ageing, St James Hospital, Dublin, Ireland

To the editor:

The Longitudinal Aging Study in India (LASI) is the world's largest aging survey, a groundbreaking nationally representative longitudinal survey to examine aging and retirement among India's aged 45 and older population. The importance of this study is reflected in the significant worldwide demographic change driven by lower fertility rates, increasing life expectancy, and subsequent aging of the population. This change will have far-reaching implications in India where the population in 2019 was 1,38 billion and projected to increase to 1,7 billion by 2050. India is expected to surpass China as the most populated country in the world by 2027.[1-3] The population aged 60 and older is projected to nearly double in the next 30 years from 10% in 2020 to 19% in 2050,[4] with critical implications for public health, family dynamics and caregiving, and public policy.

The growth in the older population will increase the importance of better understanding the burden, prevention, and treatment of common noncommunicable diseases (NCDs) associated with aging, such as hypertension, heart disease, diabetes mellitus type 2, metabolic disorders, and dementia. India has a unique evolutionary history, potentially resulting in genetic heterogeneity across ancestries[5] and endogamy leading to strong founder events. Moreover, widespread gender-discriminating practices and differential access to formal healthcare services necessitate gender-specific information to reduce the risk of NCDs.

The Alzheimer's and Related Disorders Society of India estimated that about 4 million Indians had dementia in 2010.[6] Given the rapid aging of the Indian population, this number has likely increased substantially in the last decade and may now account for more than 10% of individuals with dementia worldwide.[7] Considering the high rate of undiagnosed patients in India,[8,9] such an estimate plausibly represents a lower estimate of what the actual prevalence of dementia may be among older Indians.

In LASI, the biennial survey collects face-to-face interview and biomarker data on over 70,000 respondents. LASI has a representative sample from 30 states and 6 union territories involving 18 state languages. This was a huge logistic challenge for the LASI research team. Data collection from the first wave of the entire survey will be complete in 2021. The survey will continue for 25 years and is currently sponsored jointly by the Ministry of Health and Family Welfare Government of India, National Institute on Aging/ National Institutes of Health, USA, and the United Nations Population Fund.

By using gold standard survey protocols and state-of-art technologies, LASI has and will continue to create new research infrastructure in India and internationally, inform cross-departmental policy in health, social, and economic domains, and in scientific innovation. LASI has assembled an expert team of medical doctors, demographers, economists, sociologists, and public health and policy researchers. It is a joint undertaking of the Harvard T.H. Chan School of Public Health, the International Institute for Population Sciences in Mumbai, India, and the University of Southern California. LASI is one of a growing network of longitudinal studies around the world, modeled on the U.S. Health and Retirement Survey (HRS) that collects harmonized data available for cross-national comparisons.[10] The Gateway to Global Aging Data[11] provides a digital library of comparable questions across these surveys and identically defined variables for cross-country analysis, together with tools and resources for sister study harmonization.

The Harmonized Diagnostic Assessment of Dementia (DAD) is an in-depth study of cognitive aging and dementia for a subsample of LASI.[4] This hospital-based study estimates the prevalence of dementia and mild cognitive impairment and contributes to a better understanding of the determinants of late-life cognition, cognitive aging, and dementia in India. It draws on data from 3,244 community-dwelling persons aged 60 and older. Data were collected over 21 months up to May 2019 and archived for public access in August 2019. The data for LASI-DAD can be accessed by researchers at the Global Gateway for Data website.[11] LASI-DAD is one of a family of population-based cognitive impairment and dementia studies that includes the HRS and its sister data sets around the world. LASI-DAD is unique in its collection of biological and clinical information, coupled with a comprehensive geriatric assessment and clinical diagnosis of dementia status.[12]

This supplement introduces a number of initial key findings from LASI-DAD. For clinical syndromes such as dementia, no single definitive diagnostic test is available. In India, approaches for dementia classification based on psychometric assessment[13] are not applicable.[14] In general, clinical researchers rely on a process of data review, adjudication, and consensus by a panel of expert clinicians.[15] Because this process is challenging for population studies, LASI developed an online clinical consensus panel of experts using the Clinical Dementia Rating (CDR)[16] as the basis for the clinical diagnosis of dementia. Lee et al describe how a web-based clinical consensus platform built on the Harmonized Diagnostic Assessment of Dementia[12,17] provides consistent clinical diagnosis and a cost-effective way to obtain reliable expert clinical judgments.

In India, lower levels of early-life human capital investments in nutrition and education among women compared with men are associated with a female disadvantage in late-life cognitive health. This has important implications for public health policy aiming at reducing the risk of cognitive decline and dementia.[18]

Given that hypertension is a common modifiable risk factor for dementia,[19] when hypertension was identified by self-report of physician diagnosis compared with objective measurement of blood pressure, two-thirds of older Indian adults had hypertension, with most undiagnosed or diagnosed but not adequately controlled. In a comparative study of respondents aged 60 and older from LASI-DAD (N = 1,865) and respondents aged 65

and older from HRS-Harmonized Cognitive Assessment Protocol (HCAP) (N = 2,111), cardiovascular risk was indicated by systolic and diastolic blood pressure, pulse rate, pro B-type natriuretic-peptide, and homocysteine. Metabolic risk was measured by body mass index, glycosylated hemoglobin, high-density lipoprotein cholesterol, and lipoprotein (a). Inflammatory risk was indicated by white blood cell count, C-reactive protein, albumin, and uric acid. Hu et al[20] show that, although associated with cognitive function, the distribution of both total cognition scores and of cardiometabolic risk factors differed significantly between India and the United States. Genetic risk factors may play a role in dementia in South Asians that requires further scrutiny of the mutational spectrum in this unique population.[21]

This is the first major contribution from LASI-DAD. LASI and LASI-DAD will contribute for years to come to the national and global research agenda, providing substantive data analysis and scientific research in the key domains of health and aging and informing national and international policy and scholarship.

REFERENCES

1. United Nations. World Population Prospects 2019. UN Development Program. New York, NY: United Nations; 2019.
2. The World Bank. Population Ages 65 and Above (% of Total Population). Washington, DC: The World Bank; 2019.
3. United Nations Statistics Division. UNdata - a world of information. 2020; data.un.org. Accessed July 2020.
4. Perianayagam A, Bloom DE, Lee J, Sekher TV, Mohanty SK, Agarwal A. Longitudinal aging study in India. In: Gu D, Dupre ME, eds. Encyclopedia of Gerontology and Population Aging. Cham, Switzerland: Springer; 2019:1–5.
5. Martin AR, Gignoux CR, Walters RK, et al.Human demographic history impacts genetic risk prediction across diverse populations. Am J Hum Genet. 2017;100:635–649. [PubMed: 28366442]
6. Shaji KS, Jotheeswaran AT, Girish N, et al.The Dementia India Report: Prevalence, Impact, Costs and Services for Dementia. Alzheimer's and Related Disorders Society of India. 2010:1–38.
7. Prince MPM, Guerchet M. World Alzheimer Report - Journey of Caring: An Analysis of Long-Term Care for Dementia. London: Alzheimer's Disease International (ADI); UK: 2013.
8. Lang L, Clifford A, Wei L, et al.Prevalence and determinants of undetected dementia in the community: a systematic literature review and a meta-analysis. BMJ Open. 2017;7:e011146.
9. Llibre Rodriguez JJ, Lerri CP, Acosta D, et al.Prevalence of dementia in Latin America, India, and China: a population-based cross-sectional survey. Lancet. 2008;372:464–474. [PubMed: 18657855]
10. Langa KM, Ryan LH, McCammon RJ, et al.The Health and Retirement Study harmonized cognitive assessment protocol project: study design and methods. Neuroepidemiology. 2020;54:64–74. [PubMed: 31563909]
11. Gateway to Global Aging Data. A platform for population survey data on aging around the world: The Program on Global Aging, Health, and Policy2015. g2aging.org. Accessed July 2020.
12. Lee J, Ganguli M, Weerman A, et al.Online Clinical Consensus Diagnosis of Dementia: Development and Validation. J Am Geriatr Soc;68:S54–S59, 2020. [PubMed: 32815604]
13. John SE, Gurnani AS, Bussell C, Saurman JL, Griffin JW, Gavett BE. The effectiveness and unique contribution of neuropsychological tests and the δ latent phenotype in the differential diagnosis of dementia in the uniform data set. Neuropsychology. 2016;30:946–960. [PubMed: 27797542]
14. James K. India's demographic change: opportunities and challenges. Science. 2011;333:576–580. [PubMed: 21798938]

15. Weir DR, Wallace RB, Langa KM, et al.Reducing case ascertainment costs in U.S. population studies of Alzheimer's disease, dementia, and cognitive impairment-part 1. Alzheimers Dement. 2011;7:94–109. [PubMed: 21255747]
16. Morris JC. The Clinical Dementia Rating (CDR): current version and scoring rules. Neurology. 1993;43:2412–2414.
17. Lee J, Khobragade PY, Banerjee J, et al.Design and Methodology of the Longitudinal Aging Study in India-Diagnostic Assessment of Dementia (LASI-DAD). J Am Geriatr Soc;68:S5–S10, 2020. [PubMed: 32815602]
18. Angrisani M, Jain U, and Lee J. Sex Differences in Cognitive Health Among Older Adults in India. J Am Geriatr Soc;68:S20–S28, 2020. [PubMed: 32815603]
19. Snyder HM, Corriveau RA, Craft S, et al.Vascular contributions to cognitive impairment and dementia including Alzheimer's disease. Alzheimers Dement. 2015;11:710–717. [PubMed: 25510382]
20. Hu P, Lee J, Beaumaster S, et al.Cognitive Function and Cardiometabolic-Inflammatory Risk Factors Among Older Indians and Americans. J Am Geriatr Soc;68:S36–S44, 2020. [PubMed: 32815598]
21. Smith JA, Zhao W, Yu M, et al.Association Between Episodic Memory and Genetic Risk Factors for Alzheimer's Disease in South Asians from the Longitudinal Aging Study in India–Diagnostic Assessment of Dementia (LASI-DAD). J Am Geriatr Soc;68:S45–S53, 2020. [PubMed: 32815605]