International Journal of Community Medicine and Public Health
Shah PP et al. Int J Community Med Public Health. 2025 Nov;12(11):5384-5388
http://www.ijcmph.com
pISSN 2394-6032 | eISSN 2394-6040

DOI: https://dx.doi.org/10.18203/2394-6040.ijcmph20253315

Review Article

Census and other data collection systems in India

Pappu Prasad Shah[1], Manu Goel[2]*

[1]Department of Community Medicine, Maulana Azad Medical College, New Delhi, India
[2]Department of Community Medicine, University College of Medical Sciences, New Delhi, India

Received: 27 September 2025
Revised: 04 October 2025
Accepted: 08 October 2025

***Correspondence:**
Dr. Manu Goel,
E-mail: drmanugoel96@gmail.com

ABSTRACT

The census of India plays a vital role in the collection of accurate and reliable data from all over India. This further helps in the conduction of surveys during the interim period for various purposes. Relevant searches for articles were made on search engines like PubMed, Google Scholar etc. on the census while relevant policy documents on the census and other national level surveys were reviewed. The authors found that the census collects data not just on the Indian citizenry, it serves as the framework for almost all the national level surveys conducted across India. This enables the triangulation of data collected from these various sources. Further, the census is vital in the conduction of various activities of the nation like administration, business, research, planning and policymaking. The authors conclude that conduction of the census is an essential activity for the functioning of a nation. The association of the census with the various other surveys in the country helps increase their robustness.

Keywords: Census, National Family Health Survey, National sample survey, Sample registration system

INTRODUCTION

Census and other data collection systems in India

India, the seventh largest country is also the most populous in the world with an estimate of 1.46 billion people. The population has huge demographic diversity due to geographical distribution as well as the population composition. Moreover, the data collection has a bottom ups approach and the data is coordinated centrally. However, a lack of standard or uniform methods of collecting data poses a threat to the quality of data and the conclusions drawn from them. Consequently, the informed data-driven planning of the health programmes and resource allocation depends not only on the data but also relies on the efficient intertwining and coordination across different agencies and geo-political divisions. There are different data collection systems in India. Census is the largest and most granular of these all as it collects data of the entire population one-on-one compared to other systems like National Family Health Surveys, sample registration system, civil registration system, and national sample survey, which use sampling system.

Conducted for the first time in 1872, the National Census of India is a massive undertaking carried out decennially since to provide a comprehensive and extensive population enumeration of each individual residing within the sovereign boundaries of the nation. Enshrined and protected under the Census Act, 1948, the Census has been conducted every 10 years since 1881, without fail and completed its 15th round in 2011.[1] An extensive exercise, the census of India is the largest census conducted worldwide in terms of manpower and resources involved. It consists of two parts - the first part involves the household listing, which is followed by the second part that involves the population enumeration.[2] The census thus provides a cornucopia of information that will help guide policymakers, administrators, researchers and the general polity to understand a nation's people and help create schemes for their welfare.

The voluminous data that the Census provides is useful across all sectors and ministries. Important utility of census can be summed up in following heads.

ADMINISTRATION PURPOSE

One of the fundamental purposes of the population census is to provide data for administrative purposes. It is through the size of the population that there is political and administrative mapping. Also, the demarcation of constituencies and allocation of representations of the governing bodies depends on population size.[3] Census data offers standardized and comparable statistics at both national and subnational levels, including regions, districts, and smaller localities. This makes it a valuable tool in comprehensive planning and effective management of national affairs. Census data enables comparisons across different regions and administrative units within a country, offering critical support to decentralized planning and efficient governance. These statistics are often used to allocate public resources, funding, and services fairly across geographic areas. The size and characteristics of a population can influence certain legal or administrative decisions regarding territorial divisions, such as determining whether a formerly rural area should be reclassified as urban. In addition to this, the census also provides information on the migration in the populations. As is already known, the progression of various epidemics, new disease patterns and increase in endemic diseases is dependent on the migratory status. The effective measures can only be taken if this information is available to the administrators, researchers and policy makers.[4]

Policy formation and planning

The characteristics of the population- size, composition, geographic distribution, etc are critical for describing and evaluating the social and economic problems before planning and implementing developmental policies.[5] Policies for employment and manpower programmes, education, social services, economic and social planning, migration, and housing, are formulated effectively with the accurate census data.

Policies that are well drafted keeping in mind the good of the larger section of the population leads to easy implementation and fosters the welfare of the country and its population.[6] The data provided in the census will also help the policy level decision makers in planning for emergency measures (e.g. disasters, pandemic), control of disease outbreaks and addressing concerns in the vulnerable populations.[7]

India also suffers in rural urban divide when it comes to health care manpower and infrastructure which is majorly dominated in the urban areas due to higher amount of pay and opportunities. This gap can be effectively addressed when the actual numbers of healthcare forces are available in both the areas.[8,9]

RESEARCH PURPOSE

The population census also serves as a vital source of data for scientific research and analysis. Internationally, there is an increase in the data capture and collection regarding the vital events as well as the various socio-economic factors, especially in the developing countries. The collected data acts as a yoke and strong guidepost especially in the domain of health inequity which has drawn attention of many countries as a priority area of research and action. Due to the data that census provides, high risk populations can be identified and resources allocated accordingly, not to mention the health planning and budgeting. Every country has priority research areas on which the various health programs have been introduced which are sustaining the populations. These will also act as a base for monitoring and evaluation strategies and layout of future roadmap by the government. As we already know that finance, insurance, and housing are among the most significant socio-economic determinants of health, robustly collected data is indispensable for acting in this area.[10] It provides data for scientific analysis and appraisal of the population along with projection of the population growth. The urban-rural distribution patterns, the expansion of urban areas, and spatial variations based on factors like age, sex, occupation, education, and fertility and mortality trends across different groups are important for the purpose of research and tackling practical challenges related to economic planning, industrial development, commercial growth and management.[11]

Business and industry

Census data plays a crucial role for individuals and organizations involved in business, industry, and labour by offering reliable demographic insights that curates strategic decisions. Business and industry rely on demographic details significantly as these details shape market needs and consumption patterns. The data helps to estimate the demand of the consumer for various goods and services. Additionally, the census provides valuable information on the size and attributes of the local labour force, which is vital for aligning the national labour standards with international labour standards. These data are also used for planning the location and structure of business operations. Understanding the availability of human resources in specific regions helps industries optimize production and distribution systems effectively.[12]

Census data in planning

The census data provides a very crucial baseline data for policy development and planning. The planning commission utilizes the census data and its composition to understand trends in consumer demand, savings behaviour, and overall economic development. Additionally, the data aids in estimating national income and analysing income disparities between rural and urban populations, including their consumption pattern of goods and services and responsiveness to income changes. Understanding the

characteristics of populations in different regions based on size and composition enables policymakers to design more targeted and effective developmental strategies especially concerning essential infrastructure and services. Census data on economic engagement and educational attainment is particularly valuable for manpower planning and assessing labour market needs. Furthermore, projections for housing requirements can be made more accurately when population statistics are available.[13]

Population census to civil registration and vital statistics

The census data serves as a denominator for many vital statistics of the population census, mainly the rate specifics for population characteristics that are evaluated only at the time of conducting the census. Not only does the census help in computation of these statistics but these time-adjusted-statistics along with census can provide estimates of the future population size.[14]

CENSUS AND THE INTERACTION OF OTHER DATA COLLECTION SYSTEMS

While the census provides an extensive and complete enumeration of data, it is conducted after a period of 10 years. The long duration in time means that other data collecting systems must be relied upon in the interim period. These systems themselves, use the data collected by the census as the backbone of their sampling methodology, thus underlying the importance of the census with the collection of data at all levels. Furthermore, this form of collecting data from multiple sources is crucial from the aspect of triangulation of data. "Triangulation refers to finding a position, i.e., a fixed point, by getting bearings on different objects". Thus, in public health, data collected from multiple sources helps corroborate the data, uncover contradictory findings, strengthen the interpretation of phenomena and data, and adds a level of richness to the findings.[15]

The different data systems help in enriching the data collected by the census through these very processes as they elaborate on the findings of the census by using it as a template and providing additional data points to enhance policymakers' and researchers' understanding of the population at large. With that understanding, let us look into the various systems that function at a national level in India and how they interact with the census.

SAMPLE REGISTRATION SYSTEM AND THE CENSUS

To ensure the registration of vital events, i.e., births, stillbirths and deaths, the civil registration system was codified under the registration of births and deaths act, 1969.[16] To generate reliable and continuous data on these indicators, the Office of the Registrar General of India, also created a scheme of sample registration of births and deaths in India. Thus, the sample registration system (SRS) came into being. It was initially launched on a pilot basis in 1964-65 and then on a pan India scale from 1969-70.[17] The SRS is based on a dual record system of field investigations on a select number of sampling units spread across the various states/UTs of India. The field investigation consists of a continuous enumeration of births and deaths in the selected villages/urban blocks with an independent six-monthly retrospective survey by an independent full-time supervisor. The data thus obtained is matched, and any discrepancy noted in the two datasets is reverified in the field to reach an unduplicated result.[17] As the demography of a country is dynamic and undergoes multiple changes, the sampling units for the SRS need to be updated to reflect this change. This occurs every ten years based on the census with the last change taking place in 2014, creating 8853 sampling units (4961 in rural areas and 3892 in urban areas).[18] As the basis of deciding the sampling units in SRS is based on recent census data, the delay in conducting the census for a period of 4 years now impacts the ability of the SRS to accurately capture the demography of a changing and growing India. Furthermore, SRS provides a reliable source of mortality and morbidity indicators like infant mortality rate, crude birth and death rate, and total fertility rate. The lack of accurate data for the same will also hamper the planning of policies and programmes that require accurate and reliable figures to track their progress and status.

NATIONAL FAMILY HEALTH SYSTEM AND THE CENSUS

The National Family Health Survey (NFHS) is carried out by the Ministry of Health and Family Welfare with the International Institute of Population Sciences, Mumbai (IIPS) assigned as the nodal agency for all five rounds. Part of a global series of surveys funded by the USAID, the NFHS provides data about the population, health and nutrition status of each state/union territory and district of India. First conducted in 1992-1993, the most recent data is available from the 5th round of the NFHS, which was carried out from June 2019 to April 2021 with data collected from 636,699 households, 724,115 women, and 101,839 men. The most recent round conducted was the 6th round in 2023-2024, with the data yet to be released for the public.[19]

The NFHS employs a complex sample design based on a multi-stage stratified sampling technique. To help generate data that was representative at the national, state/UT and district level, sampling units were created from each district. The districts were first divided into rural and urban areas with a sample of villages and census enumeration blocks (CEBs) serving as the primary sampling units (PSUs) respectively. Within each rural sampling stratum, substrata were created based on the estimated number of households in the village and the population of people belonging to the scheduled caste/ scheduled tribe communities (SC/ST). These were then arranged on the basis of the literacy rate in women aged 6+ years. The PSUs would thus be chosen on the basis of probability proportional to size method (PPS). Meanwhile, in urban

strata, the PSUs were arranged based on the SC/ST population within each CEB and the same PPS method would be applied. Finally, from each PSU, a fixed number of 22 households were picked from a list of households from each PSU. The questionnaires would then be admitted to the same.[19] A delay in conducting the census has already impacted the methodology of the NFHS with the most recent NFHS, i.e., NFHS-6 being conducted using areas defined by the urban frame survey (UFS), 2017-2022 for urban areas and through villages enumerated in the data collected by the National Statistics Office, Ministry of Statistics and Programme Implementation (NSO, MoSPI).[20,21] While the UFS uses the area definition used by the census 2011, the data for rural areas collected by the NSO will be matched with the primary Census abstract for the 2011 census. Further, the total population clusters were 30,456, the same as in NFHS-5 despite an increase in the number of districts covered from 707 districts on 31 March 2017, to 731 districts as of June 2021.This shows a reliance on the same population data as was available from the census conducted in 2011. Thus, the backbone of the data used for selecting the sample for this round of surveys is rooted in the 2011 census, which is outdated and the data collected from the 2021 census should have been used instead of these stopgap measures if it had been conducted.

NATIONAL SAMPLE SURVEY AND THE CENSUS

The National sample survey (NSS) is carried out by the National Statistics Office (NSO), Ministry of Statistics and Programme Implementation (MoSPI). It is responsible for conducting a wide variety of household surveys across India focusing on various socioeconomic subjects, maintains and conducts the urban frame survey, urban and rural prices through the price collection survey.[22] This data thus generated can be used by the various ministries in programme planning and implementation of their services. Starting in 1950-1951, the NSS is carried out over a period of six months to an year with the focus of each round decided over a 10-year cycle.[23] The current round being undertaken is the 80th round. It will cover two topics, a household social consumption - health survey from January to December 2025 and a comprehensive modular survey - telecom from January to March 2025, the report for the same has already been released. The fieldwork for the first part of the survey is currently under progress.[24] The survey was conducted in a multistage stratified design. The first sampling units (FSUs) were either UFS blocks in urban areas, villages in rural areas or subunits of the same. The secondary sampling units were households within the selected FSUs. The sampling frame for each first sampling unit is based on data collected during the 2011 census, thus, underlining the crucial nature of the census as a cornerstone of conducting a survey in India.

CIVIL REGISTRATION SYSTEM AND THE CENSUS

"The civil registration system (CRS) may be defined as a unified process of continuous, permanent, compulsory and universal recording of the vital events and characteristics thereof, as per legal requirements in the country." It is published by the Office of Registrar General of India under the Ministry of Home Affairs. It is considered to be the best source of information on vital rates among all the other main sources *viz.* census and sample registration system. Although census is the main source of population statistics, it is done once every ten years only, making it less reliable than SRS and CRS as year-to-year data variation of population is not available. CRS provides continuous data even at district level, making it the most reliable source of vital statistics. Doing CRS is relatively less expensive because getting births and deaths registered is legally mandated as an administrative process [registration of Births and Deaths Act, 1969 (Act no. 18 of 1969)], thereby, more adherence is possible. The registration of birth and deaths is to be done mandatorily within 21 days of these events. The latency and delays are taken care of in this way. So, real time data is available which is of paramount importance for monitoring and evaluation of various programs. This also makes it easy to provide future projections on vital events, fertility at each level with good accuracy.[25]

CONCLUSION

India has a long and storied history in the exercise of conduction of a decennial census with 15 rounds conducted to date. The census thus provides crucial data for the functioning of the nation in various sectors like administration, policymaking, programme planning, health and research. Furthermore, it provides the backbone to various surveys conducted nationally that collect vital information on the social, religious, economic, health related and other aspects of the Indian citizenry. The interplay of these surveys enhances the robustness of the data collected and further validates the census data. Thus, we can understand how data triangulation is achieved through the conduction of the census and other surveys conducted at a national level, both at the level of execution and conduction.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: Not required

REFERENCES

1. West Bengal Census Website. Available at: https://westbengal.census.gov.in/History_of_Census.php. Accessed on 02 August 2025.
2. Population and Basic Statistics at the Local Level Government of India. Available at: https://mospi.gov.in/92-population-and-basic-statistics-local-level. Accessed on 02 August 2025.
3. New India's Policies from Old India's Data: The 16th Census Delay. Available at: https://sprf.in/new-indias-policies-from-old-indias-data-the-16th-census-delay-and-its-impact/. Accessed on 02 August 2025.

4. Wesolowski A, Buckee CO, Pindolia DK, Eagle N, Smith DL, Garcia AJ, et al. The Use of Census Migration Data to Approximate Human Movement Patterns across Temporal Scales. PLoS One. 2023;8(1):e52971.
5. Sekhar AC. Census of India 1971 series 1 India paper 1 of 1972 final population. New Delhi: Office of the Registrar General and Census Commissioner of India (India). 1972;160.
6. South China Morning Post. India risks using 'guesswork' to form policy, with census delayed as election looms. Available at: https://www.scmp .com/week-asia/people/article/3221581/india-risks-using-guesswork-form-policy-census-delayed-election-looms. Accessed on 02 August 2025.
7. Wilson RT, Hasanali SH, Sheikh M, Cramer S, Weinberg G, Firth A, et al. Challenges to the census: international trends and a need to consider public health benefits. Public Health. 2017;151:87-97.
8. Ghosh K. Why we don't get doctors for rural medical service in India? Natl Med J India. 2018;31(1):44.
9. Gupta N, Zurn P, Diallo K, Dal Poz MR. Uses of population census data for monitoring geographical imbalance in the health workforce: Snapshots from three developing countries. Int J Equity Health. 2003;2(1):1-12.
10. Colwill M, Poullis A. Using national census data to facilitate healthcare research. World J Methodol. 2023;13(5):414-8.
11. Census Delay: Impact on India's Welfare and Governance. Available at: https://www.Indian currents.org/article-census-delay-impact-on-indias-welfare-and-governance-dr-john-singarayar-2273.php. Accessed on 02 August 2025.
12. Business Standard. Making sense of the census: Do young marketing execs grasp its importance? Available at: https://www.business-standard.com/ opinion/columns/making-sense-of-census-do-young-marketing-executives-grasp-its-importance-124112201352_1. html. Accessed on 02 August 2025.
13. The Print. Decade without data – Why India is delaying Census when US, UK, China went ahead during Covid. Available at: https://theprint.in/ opinion/decade-without-data-why-india-is-delaying-census-when-us-uk-china-went-ahead-during-covid/954383 /. Accessed on 02 August 2025.
14. Reuters. Delay in India's census hurting quality of survey reports, says official. Available at: https://www.reuters.com/world/india/delay-indias-census-hurting-quality-survey-reports-says-official-2023-07-19/. Accessed on 02 August 2025.
15. Docherty B. Using triangulation in health services research. Prof Nurse. 2000;16:926-7.
16. Government of India. The Registration of births and deaths act, 1969. 1969.
17. Government of India. About Us | Civil Registration System. Available at: https://dc.crsorgi. gov.in/crs/ about. Accessed on 02 August 2025.
18. Joshi V. Sample Registration System statistical report 2020. New Delhi: Office of the Registrar General & Census Commissioner (India). 2022;142.
19. National Family Health Survey 5th round Volume I. Available at: http://www.rchiips.org/nfhs. Accessed on 02 August 2025.
20. Ministry of Statistics and Programme Implementation (India). Guidelines – Urban frame survey. New Delhi. 2017;5.
21. Union Health Minister Dr Mansukh Mandaviya releases NFHS-5 report. Available at: https://www. pib.gov.in/PressReleaseIframePage.aspx?PRID=1823047. Accessed on 02 August 2025.
22. MOSPI. National Sample Survey (NSS) Ministry of Statistics and Program Implementation. Available at: https://www.mospi.gov.in/national-sample-survey-nss. Accessed on 02 August 2025.
23. Training of NSS for socio-economic 80th round under health and education survey kickstarts. Available at: https://www.pib.gov.in/Press ReleasePage.aspx?PRID=2120281. Accessed on 02 August 2025.
24. The Hindu. NSS 80th round Socio-Economic Survey from Jan 1, 2025. Available at: https://www.the hindu.com/news/cities/Vijayawada/nss-80th-round-socio-economic-survey-from-jan-1-2025/article68982955.ece. Accessed on 02 August 2025.
25. Joshi V. Vital statistics of India based on the Civil Registration System 2020. New Delhi: Office of the Registrar General & Census Commissioner (India). 2022;142.

Cite this article as: Shah PP, Goel M. Census and other data collection systems in India. Int J Community Med Public Health 2025;12:5384-8.