

# Major Deficiencies in the National Population Census Process

Subjects: Others

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A national population and housing census is meant to collect comprehensive data on the demographics, individual characteristics, and living conditions within a country. These data are crucial for policymakers to make informed decisions regarding the economy, finance, healthcare, social benefits, import/export, education, and other sectors, ultimately driving a nation's development. The United Nations stipulates the necessity of a decennial census, a procedure conducted every ten years to accumulate data about the inhabitants of a jurisdiction. Yet, shortcomings in the census system can substantially hinder a country's strategic planning and overall interests.

Keywords: population census ; population coverage ; ethnic ; privacy ; data distribution ; costs ; participation ; ethnic and racial discrimination ; national population census ; housing and population census

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## 1. Introduction

The existing census systems are flawed, with data updates occurring only once every ten years, leading to a laborious and redundant process. This system often fails to protect the rights of minorities and marginalized communities against corrupt governments and influential individuals <sup>[1][2]</sup>. Current census data collection methods encounter difficulties in enumerating elusive populations, often referred to as "missing persons". These individuals live in challenging situations, including unregistered buildings, non-compliant house extensions, shared residences, and concealed or mobile locations <sup>[1][3][4]</sup>. Deliberate efforts by certain minorities and undocumented immigrants to evade detection further complicate their inclusion in the census. The involvement of humans in data management introduces errors and potential leaks, prompting investigations into formal solutions which reduce human interaction to ensure more precise and secure outcomes. There have been instances of statistical ethnic cleansing and misrepresentation of minorities worldwide. The current system also struggles with transparency, data quality, and the protection of personally identifiable information (PII) <sup>[5]</sup>. These problems are exacerbated by external immigrants from war zones and internally displaced populations due to climate change, as the urgency for care and relief often takes precedence over data privacy and protection requirements.

The United Nations, in collaboration with individual countries, has made significant efforts to enhance the standards of census methodologies. These endeavors aim to minimize errors and improve the accuracy of collected insights. However, despite these dedicated efforts, there remain challenges that hinder the optimal execution of census operations, particularly in terms of enumerating and accurately covering all individuals.

One of the fundamental reasons for these challenges is the limited scalability of existing solutions. Many census approaches struggle to provide comprehensive coverage or fail to be universally applicable across diverse regions and countries. Addressing these limitations requires a concerted effort to develop more scalable and adaptable census methodologies. By leveraging advanced technologies, embracing data-driven approaches, and fostering cross-country collaboration, it can work towards overcoming these pitfalls and achieving more precise and inclusive census outcomes. Moreover, continuous innovation and stakeholder engagement will be vital in creating a robust and resilient census system that can cater to different populations' unique needs and characteristics worldwide.

The existing literature identifies six major deficiencies in the national population census process, which will be discussed in the following sections. These flaws encompassed issues such as population coverage, ethnicity and race-based discrimination, apprehensions regarding data privacy and security, obstacles in the dissemination of data, substantial financial implications of executing a census, and hurdles in public engagement <sup>[6]</sup>.

## 2. Population Coverage

Census data collection has long been a concern due to its limitations in accurately covering all forms of living arrangements for individuals within a region or country. The guidelines set forth by the United Nations for enumeration recommend canvassing households, but this approach overlooks individuals who lack proper living arrangements, such as homeless communities, frequent travellers, and nomadic groups who do not associate themselves with a fixed location [7].

Unfortunately, these gaps in census data have real-world consequences. For example, during Pakistan's 2017 census, approximately 1.5 million people from Karachi were reported missing from the count [8]. Similarly, in the United States, the 2010 census missed 1.5 million children from minority communities, particularly 2.1% of Black Americans and 1.5% of Hispanics [9]. In the recent 2020 census, the estimates of both, under-count and over-count are reported (ref: <https://www.census.gov/newsroom/press-releases/2022/2020-census-estimates-of-undercount-and-overcount.html>). These discrepancies highlight the need for a more comprehensive and inclusive data collection approach.

The transparency, quality, and accuracy of data are also pressing challenges in the current census system, as is the need to safeguard personally identifiable information (PII) [5]. The sensitivity of these data makes it crucial to adopt robust data protection measures to ensure privacy and prevent misuse.

Efforts have been made to address the issue of “difficult-to-enumerate” population groups. The UN principles suggest incorporating the place of count for the census and whether it represents the individuals' usual residence, aiming to reduce miscounts of children and frequent travelers [10]. While this is a step in the right direction, it still falls short of accounting for dynamic variables and requires a more comprehensive and adaptable approach that encompasses homeless, stateless, and refugee groups.

Another significant concern is over-coverage, which occurs when there is duplication in the data, leading to individuals being counted more than once. This could happen with individuals having multiple jobs or addresses [8]. Although over-coverage can be managed, it may not always be handled in the most efficient manner.

## 3. Ethnic and Racial Discrimination

Throughout history, data collection by ruling authorities has been marred by discriminatory practices that either underestimate or overestimate certain groups based on factors like religion, race, or ethnicity. These inaccuracies have significant implications, as census figures play a crucial role in policy-making and funding decisions. When certain communities are underrepresented, it leads to an unfair allocation of funds, depriving them of much-needed financial assistance.

For instance, the 2010 US census underrepresented Native American populations of Navaho origins and Alaskan natives by 4.9 percent. The 2020 census is expected to exacerbate under representation, especially in regions with inadequate broadband access due to the shift to online data collection [9]. In India, the implementation of the Citizenship Amendment Act (CAA) law, which bans Muslim immigrants from settling in the country, has sparked country-wide uproars and riots, raising concerns about the safety and under representation of the Muslim population in the upcoming decennial census [11].

Efforts have been made in census data collection to be more inclusive, such as counting Sikhs as an individual ethnic community in the 2020 US census [12]. Similarly, India plans to account for households run by transgender individuals separately, rectifying the earlier mislabeling of such households as male-headed households [13].

However, there are inherent drawbacks in the current system. The data update process for each individual is laborious and repetitive, and there is a need to protect the rights of minorities and marginalized communities from corrupt governments and selfish potentates [1][2]. For instance, Nigeria's census has witnessed instances of statistical ethnic cleansing and misrepresentation of minorities [10].

## 4. Privacy

Privacy concerns related to census data have become increasingly significant with the advancement of technology. In the past, the primary worry was the possibility of data leakage to enemy states, which could provide them with valuable information for planning attacks. For example, a cyber-attack on the Census Bureau exposed personnel data for approximately 4200 individuals, highlighting the need for stronger data protection measures [3].

In more recent times, the concerns are similar but pertain to both the use and storage of census data. In the Australian census, there was a public outcry when the option to opt-out of retaining the original names of users was removed without sufficient consultation or prior knowledge <sup>[14]</sup>. These privacy concerns can lead to reluctance or even boycotts of the census.

Centralized data storage also raises privacy concerns, as it makes data vulnerable to cyber-attacks. The rise in cyber crimes necessitates a more technologically advanced and secure approach to data maintenance, access, and storage to address privacy concerns among the population.

In the past, privacy concerns have led to legal actions. In Germany, citizens sued the government over a 160-question long census questionnaire, raising concerns about the potential identification of individuals through the collected information. The ruling established a right to “self-determination” of the information shareable by citizens, in contrast to the surveillance behavior seen in Nazi-Germany <sup>[15]</sup>.

Data leakages can occur in four ways, as identified by Dunn and Austin <sup>[16]</sup>. (i) Accidental leakage may result from human errors, oversight, or ignorance in handling data during the traditional census process. The number of individuals involved in the census process increases the risk of such leakages. (ii) The second form of leakage is driven by malicious intent, where involved parties seek unauthorized access to data for criminal purposes. Strict precautions, training, and penalties are necessary to prevent this type of leakage. (iii) The third form of leakage arises from legal obligations, such as court orders which require the disclosure of information publicly. Efficient means of validating personal information without disclosing actual data can help handle such circumstances. (iv) The last form of leakage is related to statistical necessity, where data are disclosed to researchers or the public for analysis and interpretation. While insights derived from data analysis do not violate privacy, disclosing actual identifiable data can raise concerns about data misuse and potential human errors leading to leakage.

Addressing privacy concerns in census data collection requires robust security measures, data protection protocols, and strict compliance with privacy regulations. Furthermore, involving the public in discussions regarding data collection and ensuring transparency can build trust and confidence in the census process.

## **5. Census Data Distribution**

Another vital aspect to explore concerns the mechanisms employed by census bureaus for sharing data with relevant or requested authorities. Juran <sup>[5]</sup> delves into the reports from the 2010 world program on population and housing censuses to comprehend the primary methods utilized for disseminating census data. It was found that approximately 63 countries predominantly employ paper publications for data distribution. In contrast, 34 countries rely on static web pages, and a mere 17 countries have adopted interactive online databases. Predominantly, developing nations utilize paper-based methods, alongside CD-ROMs and DVDs, for data distribution. Notably, almost all countries, including the United States, lack a distributed and decentralized system capable of meeting the requirements of all stakeholders in a timely manner.

## **6. Cost of Census**

Conducting a census is an extensive and resource-intensive task that involves significant costs, including human capital, financial expenses, and materials required for data collection and enumeration. The scale of census activities contributes to their steep costs, which tend to increase over time. The type of census also influences the costs, with a full-field research census being more expensive compared to administrative censuses or small-scale enumerations in specific areas <sup>[17]</sup>.

The cost of conducting a decennial census in the United States serves as an illustrative example. The 2010 census cost approximately thirteen billion dollars, which was twice as much as the cost of the census in the year 2000. Similarly, the cost of the 2000 census was double that of the 1990 census. These escalating costs are due to the growing complexity of census processes as the population increases <sup>[18]</sup>. In fact, the estimated cost for the latest decennial census in 2010 increased from an earlier projection of 11 billion dollars to 14 billion dollars. This increase was a result of abandoning the handheld devices called NRFUs (Nonresponse Followup) and reverting to the traditional paper approach, which required more trained field staff to conduct in-person data collection <sup>[19]</sup>.

## 7. Cooperation and Participation

Public cooperation and participation are crucial aspects of the census process. Historically, there has been public reluctance regarding census data collection, often stemming from concerns about potential increases in taxation or other adverse consequences. However, in recent years, this reluctance has decreased, although government still need to exert efforts to improve coverage.

To encourage participation, governments invest in media coverage and advertisements to raise public awareness about the census. For example, in the United States, in-post mail is sent to addresses of households to encourage responses. In 2010, about 83 percent of households responded to the in-post mail on time. The remaining non-responsive households required on-field workers to conduct in-person data collection. In developing countries like Bangladesh, where literacy rates may be lower, schoolteachers were engaged to spread census awareness and later perform in-person enumeration duties. This approach can be costly for the government, especially in developing states, as additional resources are needed to ensure widespread census knowledge and coverage [20].

In conclusion, census data collection faces challenges in counting hard-to-reach populations, commonly known as “missing persons”. These individuals reside in difficult-to-enumerate situations, such as unregistered buildings, non-compliant house extensions, shared residences, and mobile or hidden locations. Certain minorities and undocumented immigrants intentionally avoid detection, complicating their inclusion in the census. Human involvement in data management introduces errors and leakages, prompting the exploration of a formal solution minimizing human interaction for more accurate and secure results.

Addressing these challenges necessitates a multidimensional approach involving technological advancements, community engagement, and adaptive enumeration methods. Utilizing modern technologies, like blockchain-based solutions, could enhance accuracy, efficiency, and inclusivity in census data collection while preserving data privacy and security. Collaborating with local communities and incorporating their knowledge ensures a more comprehensive enumeration, especially for historically underrepresented groups. These steps contribute to building a more reliable and equitable census system that accurately reflects the diverse population of a region or country.

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