Distr.: General
09 August 2024

English

Economic Commission for Europe

Conference of European Statisticians

Group of Experts on Population and Housing Censuses

Twenty-sixth Meeting
Geneva, 2–4 October 2024
Item 5 of the provisional agenda
Transformations in population statistics

Envisioning the future of national census agencies: Tech-driven, inclusive, and trustworthy

Note by the Deloitte Center for Government Insights*

Summary

This study explores the imminent transformation of census agencies worldwide, driven by technological advancements and societal changes. A rise in artificial intelligence (AI) and improved data integration capabilities can help democratize data and facilitate real-time population insights. The broadening scope of administrative data across government agencies and levels can be seen as a step towards holistic population insights. There's potential for further expansion by integrating private sector datasets, like social media, banking, and retail transactions. However, maintaining data integrity, reducing bias, and enhancing data security and privacy are primary challenges. Census agencies are thus focusing on strengthening public trust, using strategies such as data security, systemic transparency on collected data, and civic participation. Deloitte's global research emphasizes that privacy and security of personal data are top challenges while accessing digital government services. Hence, census agencies should work to bolster data security and build cybersecurity skills internally. The study, based on Deloitte's global research on government digital transformation, case studies, and insights from leading census public officials globally, will help envision the future of national census agencies and population statistics.

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I. Introduction

1. In 2012, as Hurricane Sandy hurtled toward the New Jersey coast, the state urgently needed accurate local information to devise evacuation, shelter, and rescue plans. After the storm, agencies needed additional detailed information to rebuild communities, infrastructure, and businesses. A data-sharing programme between the state and the federal government helped make this possible.[1]
2. As a part of this programme, the United States (US) Census Bureau had access to state-collected data on local businesses and jobs. This "administrative" data from the state included information about the status of commercial enterprises—when they started, shut down, added or lost employees. The Census Bureau also tapped into localized data collected through its American Community Survey to help identify the number of people living in disaster areas, where they work, the type of businesses in those areas, demographic details of residents, and the languages they speak.[2]
3. By linking these federal and state datasets, New Jersey developed a new mapping tool, OnTheMap for Emergency Management, to direct aid and help local businesses and communities recover quickly.[3]
4. The Hurricane Sandy emergency response is just one example of how invaluable census data can be for government leaders, policymakers, researchers, academia, and businesses. Central statistical agencies, like the Census Bureau, are critical in collecting population insights beyond the decennial or five-year surveys they publish. These agencies create hundreds of data products weekly, monthly, quarterly, and annually.
5. Change is afoot, both at a societal and technological level, that could shape the future of census agencies in the coming decades. Nationwide censuses are being conducted in different societal and technological contexts than in previous decades. Many countries have moved to a primarily digital-first census survey, with in-person surveys conducted mainly in hard-to-reach communities.
6. At the same time, data availability across government has exploded, and data governance guidelines have matured. Gone are the days when government data was often unstructured and inaccessible due to government data silos.[4] With the growing ubiquity of digital systems, data has been freed from its traditional jurisdictional confines. More and more data is available across government systems in machine-readable formats that can be integrated and ingested into large data analysis platforms. This can give census organizations a better starting point to get population insights beyond traditional surveys.
7. Beyond data ubiquity, advances in digital technologies like geographic information systems, remote sensing, and artificial intelligence are upending census operations. Getting the most value from these technologies requires census agencies to redefine processes and operational systems to better reflect the changing technological and digital landscape.
8. Increasingly declining public trust and the growing equity imperative will continue to challenge census agencies to ensure a complete population survey or insights on hard-to-reach communities. This could be seen in voluntary response rates on the decennial census across geographies. With each decennial census exercise, the voluntary response rate from citizens—both online and offline—has declined.[5] There are many possible reasons for this decline, ranging from rising distrust in government institutions to survey fatigue to rising privacy concerns in individuals and businesses.[6,7]

9. Some of these shifts, such as advances in digital technology and data ubiquity, can be transformational for national statistics agencies, while other shifts like declining public trust and a growing equity imperative may challenge census activities altogether as they strive to provide population insights faster, better, and in almost real-time. (See My Take: Getting future-ready for the 2030 Decennial Census). National census agencies should adapt to these changes to remain effective and relevant. Not understanding these paradigm shifts could result in inaccurate population insights, which could, in turn, lead to less effective policymaking.

My Take
Getting future-ready for the 2030 Decennial Census
Jennifer Reichert, Chief, Decennial Census Management Division, U.S. Census Bureau

"As we approach the next decennial census, it's important to acknowledge the progress we've made since the 2020 census and the opportunities that lie ahead of the 2030 census. The 2020 census was marked by major innovations and changes, such as the implementation of internet self-response and automation of previously manual operations. Despite the challenges posed by the pandemic and natural disasters, these innovations proved to be highly successful.

Building on the success of the 2020 census, our focus for the next decade is to improve upon the existing design and take advantage of new technologies. Our primary goal is to enhance the quality of the census data and ensure we're addressing data user needs.

The first big innovation is the timing in which we process data. Instead of processing the data after the eight-month data-collection phase, we will begin processing the data earlier in the lifecycle, almost on a transactional basis. This will allow us to go back to the field or do additional data collection if we find oddities in some geographic or demographic groups. Previously, if we encountered any quality issues in the data, we had to use statistical methods after the collection period to normalize them.

Another key strategy is the use of administrative records. In the 2020 census, we successfully incorporated administrative data into our operations, reducing costs and improving productivity rates. For the 2030 census, we plan to expand the use of administrative records, supplementing household responses and addressing quality concerns. We acknowledge that administrative records are not a one-size-fits-all solution and that there are communities that still require hands-on engagement, which will continue to be an important part of our job in the next decennial as well.

In addition to leveraging administrative records, we are also investing in automation to optimize our operations and minimize respondent burden. By introducing automated tools and incorporating quality checks at the earliest stages of data collection, we aim to improve efficiency and accuracy.

Building on the successes and lessons of the past, we are confident in our ability to provide valuable data products and conduct a comprehensive and accurate census in 2030."

II. An era of tech-infused census

10. Advances in technology and data analysis will play an important role in transforming census counts in 2030 and beyond. Although many countries have transitioned to an online census over the past two decades, the decennial or five-year census counts are still a labour-intensive "knock-on-doors" activity in many countries, and understandably so. There is a growing public distrust in some communities that hinders voluntary survey intake, and data suggests that voluntary survey responses have declined over the last few decades.[8] Moreover, challenges persist regarding access to the internet or digital devices and the ability of some citizens to complete a survey online. Additionally, census enumeration and normalization of the address records are still largely manual exercises.

11. Census enumeration is a critical clerical task that precedes any big decennial census exercise to ensure that the addresses on record match the current dwelling status of households. Census enumerators sometimes have to physically go to the field to check addresses and compare them with the records, adding new real estate developments and deleting records of old demolished dwellings. This process is highly time-consuming and requires a significant workforce to normalize address records. For instance, the US Census Bureau uses lengthy administrative data modelling methods to support its data collection operations.[9]

12. However, advances in geographic information systems and remote sensing technologies can help census agencies create accurate and up-to-date maps of large enumeration areas. These technologies can help census organizations analyze and visualize changing spatial patterns in data such as population density, urban or semiurban sprawl, changes in physical structures, and more. For instance, by comparing snapshots of maps from different years, enumerators can identify demolished dwellings, newly developed homes, recent physical infrastructure like schools and hospitals, and new businesses opened between the two snapshots. This can allow census organizations to identify geographic areas they may need to target during physical enumeration activity.[10]

13. Meanwhile, AI and machine learning tools can further automate the overall census process. As census agencies move toward more administrative data to improve operations, machine learning models can compare data across a wide array of datasets, automate data processing, identify data inconsistencies, and integrate data quickly with high accuracy. This involves merging data snippets from different datasets like tax records, education, and health data to create a partial or complete picture of an individual or household. Automating such tasks can help reduce high-volume but low-value manual tasks and reduce error rates in data processing.[11]

14. Machine learning algorithms can analyze large volumes of census data and identify patterns, trends, and anomalies that may be difficult to detect using traditional statistical methods. For instance, census agencies can use machine learning to understand representation in ongoing surveys and allocate resources more efficiently to ensure better coverage of hard-to-reach communities.[12] Similarly, AI can analyze survey responses with other administrative datasets to check for anomalies, errors, or deliberate incorrect data inputs from citizens. Additionally, AI and machine learning can be used to develop predictive models based on historical census data, helping to forecast population growth, migration patterns, and other demographic trends.[13] (See My Take: Technology can help reimagine and improve census operations)

15. The emergence of Generative AI offers new opportunities for making census data accessible to citizens, communities, and research organizations. A primary prerequisite for a Generative

AI application is the availability of a high volume of training data—something census agencies have in spades. Generative AI solutions can help democratize census datasets for the public and non-technical users by allowing them to retrieve knowledge through simple natural language questions (figure 1). Census agencies may harbour concerns about losing control over population data and ensuring data privacy and security. However, some of those apprehensions can be addressed with advances in generative AI solutions and more secure cloud environments.[14]

Figure 1

Technology can upend census operations and improve productivity

Technology	Application areas
Geospatial or geographic information system technology	Ability to create accurate and up-to-date maps of large enumeration areas. Also, analyze and visualize changing spatial patterns like population density, urban sprawl, and changes in physical structures.
Remote sensing, sensors, and satellite	In-situ sensors and satellite technology help improve agriculture census operations by enhancing accuracy and monitoring crop growth, land use, and water usage.
Artificial intelligence and machine learning	Ability to automate data processing, identify data inaccuracies, reduce manual error rates, identify patterns and trends in data, and develop predictive models.
Generative AI	Help democratize census data sets for nontechnical users by improving the ability to retrieve insights through simple natural language questions.

Source: Deloitte analysis.

Deloitte. | deloitte.com/us/en/insights/research-centers/center-for-government-insights.html

My Take
Technology can help reimagine and improve census operations
Geoff Bowlby, Director General, Census Programme at Statistics Canada

"The internet response rate for census surveys is significantly higher in Canada than in other countries, yet refining online surveys has been a major focus for us at Statistics Canada. A major change we're implementing for the 2026 census involves allowing access to the internet response without a secure access code, a method already in use in Australia, America, and the United Kingdom (UK).

This approach still ensures security while simplifying access. Under the new system, if the access code provided through the mail or delivered by a Statistics Canada agent is lost or not received, respondents can enter their address on the main online response portal, which will securely generate an access code for them. Despite

sounding simple, this change significantly alters our operations at the back end. More importantly, it improves the experience of citizens who currently have to call an often-overloaded Statistics Canada call centre to get a secure access code.

Related to this, other technological development is aimed at individuals without a civic address, particularly those in rural areas. In such instances, if an address cannot be entered to generate a secure access code, a Google Maps-style feature allows respondents to pinpoint their dwelling on a map. This allows the respondent to complete their census online, and because Statistics Canada can associate the completed questionnaire with the dwelling on the map, follow-up by a Statistics Canada agent is avoided. Another application of geographic information system technology has been in agricultural surveys, where we use satellite imagery to measure crop yields and types instead of asking questions to farmers.

We're also introducing a chatbot feature for field operations to support respondents. In 2021, we could not answer about a million inbound calls because they were concentrated over a few days. The chatbot will allow for responses to common questions, in natural language and in English and French. This, in combination with the provision of a secure access code, will hopefully eliminate the issue of unanswered calls without increasing the number of call centre employees.

We're also exploring AI applications in the census, particularly in the post-collection stages. AI can make operations more efficient, such as the automated coding of questionnaires. AI can also aid in first-level analysis of census data, spotting outliers and potential errors in aggregated data. Finally, to aid the public in understanding census data and eliminate the need for individuals to search for information, we're considering training an AI to answer questions using reference documents. These applications promise to enhance our operations, making them more efficient and user-friendly."

III. National population data as a knitwork of administrative datasets

16. Government agencies have always collected data specific to their mission needs and used it to make critical decisions and shape policy. Large swathes of such data are available across departments and levels of government. With advances in data governance processes, many new administrative datasets can now be standardized, anonymized, and made machine-readable—a prerequisite for deeper integration and analysis. (See My Take: Transforming the US Census Bureau into a data-centric organization)

17. Using administrative data as the primary source for national population statistics is not a new concept. Nordic countries were pioneers in using administrative data or register-based census, which refers to data obtained from various registers or administrative sources like the population register, building or dwelling register, tax register, social security register, business register, and more.[15] The data in these registers can be linked, generally through a personal identification number, to generate population insights.[16]

My Take
Transforming the US Census Bureau into a data-centric organization
Barbara LoPresti, Chief, Decennial Information Technology Division, U.S. Census Bureau

"The Business Ecosystem is the Census Bureau's commitment to becoming a modern data-centric ecosystem and is the foundation for the technology innovation we're leading ahead of the 2030 census. Our goal is to shift our focus from managing surveys and censuses in silos to creating a comprehensive ecosystem that ultimately enables us to deliver data products that best address our stakeholder needs.

At the core of the business ecosystem are four enterprise initiatives. The first initiative is the Enterprise Data Lake, which is a cloud-based infrastructure that is the hub for processing, storing, and computing data and allows us to scale in a central location. By consolidating our data sets, we eliminate duplication of effort that historically occurred in different stovepipes or silos.

The second initiative is the Frames programme, which integrates various geospatial, economic, jobs, and demographic frame data. This integration provides a wealth of data for our data scientists, demographers, and mathematicians that was previously siloed. It also opens up exciting possibilities for creating new data products for stakeholders through linking and matching different data sources.

The third initiative aims to streamline various modes of data collection, such as paper, internet, and personal interviews. This initiative is called the Data Ingest and Collection for the Enterprise (DICE). This will play a vital role in our data collection efforts for the 2030 census and several tests leading up to it.

Lastly, the Census Enterprise Dissemination Services and Customer Innovation (CEDSCI) platform provides public access to our information. As new data products are made available through the cloud, Frames programme, and other initiatives, this will give stakeholders access to products.

In addition to these initiatives, we are actively moving away from proprietary technology and embracing open-source and cloud-native technologies. A shift in this direction will allow us to improve the productivity of our IT resources and promote continuous learning among our staff."

18. Today, more countries are considering using administrative data as the starting point for generating national population statistics, and not as a replacement for traditional surveys. "Many countries will be using administrative data by the 2030 census round. That's not to say they'll necessarily be using it as census data, they might use it as a supportive means of building their address register and sampling frames, and so on," mentioned Fiona Willis-Núñez, Statistician at United Nations Economic Commission for Europe.[17]
19. There are likely a few reasons for this shift in many national statistics agencies:
    a. The availability of data and the technology needed to create such a data infrastructure is now often more accessible.
    b. There is growing survey fatigue among residents, and such administrative data can allow agencies to reduce the number of questions and surveys.
    c. National population survey costs have increased significantly over the years. For instance, New Zealand spent nearly US $200 million on its 2023 five-year

census survey[18,] while Scotland spent US $176 million on its decennial census in 2022[19], and England and Wales spent US $1.1 billion.[20] In the US, the 2020 census will have cost roughly $13.7 billion by the time its activity ends in 2024.[21]

20. The advances in administrative data integration capabilities are a first step toward supporting and supplementing traditional census surveys. However, administrative data may be insufficient in providing information about ethnicity, physical attributes of a household, or personal opinions and choices. "So everything around ethnicity is very, very valuable because the census enables people to provide granular information about their ethnicity," says Jonathan Wroth-Smith, Director of 2022 Census Statistics, National Records Scotland. "Administrative data may not be able to provide that level of detail on ethnicity but of course is much more timely. This represents some of the challenges involved in balancing frequency and fidelity" adds Jonathan.[22]
21. National statistical agencies acknowledge that gaps exist in such data platforms, particularly affecting those without digital access or footprint. Such discrepancies could lead to an overrepresentation of individuals or businesses who frequently interact with the government digitally while underrepresenting constituents who don't. This is where surveys become essential and valuable in ensuring that census data is representative and without bias.
22. Through administrative data, census agencies aim to bring more specificity to their data collection efforts: use the available data to reduce survey burden and survey hard-to-reach communities and cohorts without digital access. In New Zealand, a similar initiative is underway to bring together varied data in government silos into a single platform called the Integrated Data Infrastructure. (See My Take: Moving away from a one-size-fits-all census survey).

My Take
Moving away from a one-size-fits-all census survey
Mark Sowden, Government Statistician of Stats New Zealand

"The five-year census exercise we completed in 2023 provided valuable population insights on New Zealand's post-COVID era. Although the 2023 census was successful and informative, it was also challenging and expensive.

Moving forward, we can achieve the same value at a lower cost by adopting an administrative-data-first model. During the 2023 census, citizens often asked why they needed to provide information the government already had. In some cases, this is true; we can access data from various government sources, such as health records and tax information. While this administrative data is useful for the census, it may not provide a complete picture.

We have to consider incorporating external data, such as credit card and retail spending. Of course, we will have to be intentional about this and work with private sector partners to get access to such data points while ensuring citizen data privacy.

Shifting to this mindset allows us to move away from the traditional labour- and cost-intensive census model, which involves surveying large populations. Instead, we can allocate resources to conduct targeted surveys with hard-to-reach and Indigenous communities.

For example, in our recent census survey, we partnered with Iwi (Māori tribe) community organizations and influencers to collect local-level data, ensuring high-

quality results. This concept can be extended to other communities, such as the LGBTQIA+ community. However, such targeted approaches can be more costly, so an administrative data-first model can help distribute resources more effectively.

We recognize the value of an administrative data-first approach that combines various sources, including census surveys. However, we also acknowledge that some questions cannot be answered through administrative data alone, such as "Do you have mould in your house?" or "How many hours of voluntary work do you do in a year?" It is crucial to determine when and how to use surveys and administrative data to enhance the efficiency, quality, and speed of population insights."

IV. Evolving a security-by-design mindset

23. A census database is one of the most comprehensive records of citizens in a country, making it a valuable national resource and, at the same time, very vulnerable to significant security and privacy risks if it falls into the wrong hands.
24. Census agencies are working to build confidence in their data protection methods, which can help them collect data more effectively and gain public trust in the census process. "We should talk about privacy measures, security safeguards, and the ethical side of the census to give citizens more confidence," says Mark Sowden, chief executive government statistician of Stats New Zealand.[23]
25. Many national census agencies adhere to a set of policy principles to safeguard and protect data and are also governed by law:
    a. **Confidentiality:** In many countries, census data is encrypted and stored in a private cloud managed by the government, and only authorized personnel within the government can access the data. Physical forms stored in a secure government facility are under constant video surveillance. Once the documents are digitized, they are destroyed to ensure complete protection of the information.[24]
    b. **Data access restrictions and non-release clauses:** Although census data is made accessible to the public, many organizations are legally prohibited from providing any personally identifiable information. Many census organizations keep data secure and confidential for about 100 years, and there are penalties for disclosing personal data without lawful authorization.[25, 26]
    c. **Encryption and anonymization:** Census agencies have multilayered security systems, encryption facilities, and processes in place to avoid data breaches. Many census agencies also anonymize data by removing or modifying personally identifiable information.
26. However, data hackers and technological advances are sometimes ahead of the data protection and security curve. For instance, in 2019, the US Census Bureau acknowledged that privacy controls used in the 2010 census were not robust enough. Internal tests revealed that census officials could match census data with publicly available information and commercial datasets from social media companies to get the accurate age, gender, location, race, and ethnicity information of one in six Americans.[27]

27. The growing ubiquity of data systems and the advent of AI are expected to make data security and privacy increasingly challenging for census agencies. Traditional techniques and protocols may not be strong enough anymore. Census agencies should continuously evolve their data protection methods and tools to stay ahead of hackers and malicious actors. Census agencies could experiment with a new evolving class of techniques, such as privacy-enhancing computation, to protect sensitive information.[28]

28. Privacy-enhancing computation is an umbrella term for emerging privacy protection techniques, including cryptographic methods, homomorphic encryption, zero-knowledge proofs, secure multiparty computation, and differential privacy.[29] These techniques can be used when multiple parties contribute confidential data and collaborate on tasks.

29. The US Census Bureau started implementing one of the privacy-enhancing computation techniques called differential privacy in 2020 to protect identities and personal information. The technique involves intentionally injecting "noise" into the raw data so that there is a variance from the actual data.[30] For instance, the total population of each state will be the actual number, but all other levels of geography, including census blocks, townships, and congressional districts, could have some variance from the raw data. However, these techniques may create data inconsistencies for rural areas, small subpopulations, smaller states, and longitudinal studies. Census organizations must strike the right balance between accuracy and risk of disclosure to ensure data protection and to build trust in the census process.[31]

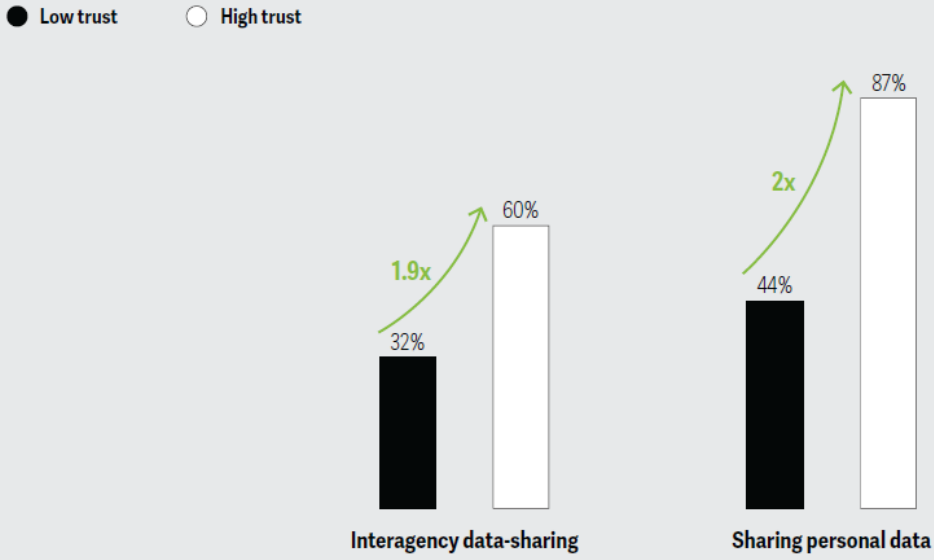
V. Leading with trust in a fractured public trust environment

30. Public trust has been declining in many countries for years, according to the annual Edelman Trust Barometer.[32] Although government interactions with citizens play a big role in building greater public trust, they might not be the only factor driving it down. The Edelman Trust Barometer states that disillusionment with rising inequality can undermine public trust.[33] Moreover, there is a growing disparity in trust between the informed and the general populace, partly fuelled by the rampant growth in misinformation or disinformation. These external factors dent public confidence in government institutional processes, systems, data-collection initiatives, and much more.[34]

31. One outcome of this declining trust is that people are less willing to share personal data with the government, including for census surveys. Deloitte's global citizen survey, conducted across 13 countries to gauge the public's perceptions of government digital services, indicates the close relationship between trust and a willingness to share data. For instance, the analysis suggests that citizens who trust the government are twice as likely to share personal data and 1.9 times more likely to allow interagency data-sharing than citizens who report low levels of trust in government. (Figure 2).[35]

Figure 2

Higher trust is linked to higher comfort in the government collecting personal data and sharing it internally



Notes: Interagency data-sharing: "I am comfortable with government agencies across levels of government (e.g., city, region, and nation) sharing my data with each other with my prior consent to offer personalized services"; Sharing personal data: "I am comfortable with government agencies collecting my personal data"; Trust: "I trust the government [tax and revenue departments, law enforcement agencies, social welfare agencies (e.g., unemployment and children welfare), public health care departments] will protect my data." Low trust: strongly disagree + disagree. High trust: strongly agree + agree.

Source: 2023 Deloitte Digital Citizen Survey.

Deloitte. | deloitte.com/us/en/insights/research-centers/center-for-government-insights.html

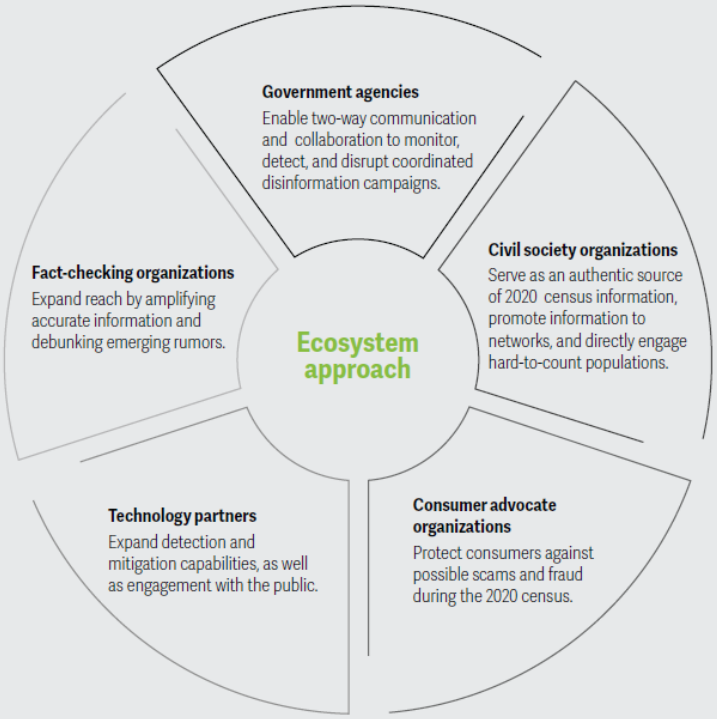
33. Active engagement and communication with communities and community leaders and influencers are crucial, especially with communities that are hard to reach. For example, during the 2020 census, the US Census Bureau established a unique Trust and Safety team.

34. The team's main focus was to combat disinformation and misinformation about the 2020 census that could potentially harm response rates. This was achieved by working closely with government agencies, fact-check organizations, civil society organizations, and technology companies (figure 3). The Census Bureau's efforts in building trust were important in helping drive participation and achieving a 99.9 per cent response rate in the 2020 count.[36]

35. Overcoming the trust deficit with certain population cohorts or hard-to-reach communities requires a broader approach to building trust with these communities, including tapping into and working with trusted networks and partners in these communities. [See My Take: Tapping into networks of trust]

Figure 3

Ecosystem approach to countering US 2020 census misinformation



Source: Deloitte analysis.

Deloitte. | deloitte.com/us/en/insights/research-centers/center-for-government-insights.html

My Take
Tapping into networks of trust
Linda Sinclair, director of corporate services and accountable officer at the National Records of Scotland

"The 2022 Census was difficult for us since it was completed during COVID-19 restrictions and stay-at-home mandates. The residents were feeling fatigued into the second year of the pandemic. We wanted to make the census count process as seamless and convenient as possible for our residents. We focused on three core tenets to ensure a high participation rate in our decennial census exercise: a multifaceted communication strategy, in-person and online support to fill out the survey, and tapping into networks of trust to ensure we bring in hard-to-reach communities.

We had a multifaceted communication strategy in place, including instant messages. More than 9 million letters went out to people trying to explain the importance of the census alongside a continuous media campaign on television, radio, posters, and digital ads to maintain the momentum. Additionally, we had a dedicated, free-of-charge contact centre to assist in completing the census.

Moreover, we leveraged our stakeholder network to achieve a successful count. We worked very closely with more than 200 partner organizations, including the Scottish government, local authorities, key organizations, and partners across the third

sector, to ensure the value of the census was communicated, especially to those at most risk of nonparticipation.

We ensured that the census questionnaire could be translated into more than 16 languages and had an online language support helpline. We also made it accessible as audio, in large print, Braille, or British Sign Language. People could also request a paper copy if they lacked digital access.[37]

We also realized that a model that works in one community might not work in another, so we tailored our approach to reach everyone. We collaborated with community organizations serving different sectors, such as older people and hard-to-reach ethnic population groups.

These networks of trust helped us count hard-to-reach communities. We used existing local relationships with community-based support workers to engage with specific cohorts and population groups. We tapped into those networks to put up community pop-up stands to get people to fill out the census with the help of someone from the community. Additionally, community organizations helped broadcast the census message through their social media channels to reach the right audience and have the right impact."

VI. Showcasing the value of census

36. Filling out a census form can be a time-consuming task. Households may have to carve out 20-30 minutes, depending on the number of household members, to fill out lengthy surveys for which they might not see an immediate benefit. In many countries, residents participate in the census due to a constitutional mandate and to avoid hefty penalties and fines for not responding to the survey.

37. Census agencies seek to increase awareness and motivate people and businesses to care about the census rather than simply enforcing it as a legal measure. One way to nudge people to share their data is to demonstrate the value that their data generates. Understanding an individual's or community's unique needs or requirements can help make a better case for census. For low-income populations, it may be financial aid or support benefits. People with disabilities need accessible services for a healthy lifestyle. For young parents, services for their children in the future can strike a chord.

38. The census data has an economic impact on a wide range of areas, including land use designs, transportation planning, and infrastructure investment decisions, among others. As a key part of the country's overall statistical infrastructure, the census has a ripple effect on other surveys. For example, the Labour Force Survey in Canada, which calculates the monthly employment and unemployment rate to make job creation decisions, is benchmarked to the census.[38] Every five years, when the census is conducted, the Labour Force Survey gets rebased on the new population estimate recorded in the census. These inputs are critical for shaping labour market policies and reimagining unemployment services in the region.[39]

39. Government statistical agencies should keep demonstrating and reiterating the value of census data to individuals, communities, businesses, and other government agencies. "Few of us think about it, but Commerce Department data touch and benefit all Americans daily," says Penny Pritzker, ex-Secretary of Commerce, in the 2014 US Census Bureau's Newsletter

"…whether through our cell phones, the weather report, or the economic and demographic characteristics of our nation and communities." "Yet, too much valuable data may fly under our radars," she adds.[40]

40. People who understand how census data directly affects their daily lives are more likely to complete it on time. For example, remote island areas such as Orkney and Shetland were the quickest to respond to the recent census survey in Scotland. They had the highest response rate overall because they understood the importance of that data for their communities. Over the years, they have realized that the census data is critical for funding local infrastructure projects and other services like schools and hospitals.[41]

VII. Designing for equity

41. Census agencies strive to gather comprehensive data on every individual in the country, especially those who are traditionally undercounted or have been excluded in the past. Some of these groups include individuals and communities who live in rural or remote areas, the ageing population, people experiencing homelessness, immigrants who face language barriers, Indigenous communities, racially and ethnically diverse people, and the LGBTQIA+ community.[42]

42. Census agencies are employing various strategies to obtain more diverse and inclusive data to ensure the representation of marginalized communities in policymaking. For instance, in Canada, one in four people counted in the 2021 census were immigrants. Since their first language is often not English or French, Statistics Canada translated census questions into 25 languages, including 13 Indigenous languages.[43]

43. In the 2020 census, the US Census Bureau made a concerted effort to ensure that it counted people experiencing homelessness. To achieve this, the bureau partnered with local groups to identify locations where people were known to sleep.[44] The operation involved specially trained census takers who counted people in shelters, soup kitchens, and mobile food van stops and those who lived outdoors or at transit stations—essentially, any location where homeless individuals were known to reside.[45]

A. Community-driven census could hold the key to a better count

44. Many hard-to-reach communities may not feel the need to participate in census surveys since they may not be aware of the importance of the census.[46] Also, a history of exclusion, unfair treatment, and discrimination can lead to trust deficits. Census agencies can alleviate the lack of trust and apprehension in these groups by working with networks of individuals from these communities. By doing so, census agencies can develop a more locally-driven model that taps into the existing trust within these networks.

45. Statistics New Zealand has leveraged trust networks to help improve the census experience and participation of Indigenous communities. The agency deployed a Māori-first marketing campaign to ensure census messaging reached these communities nationwide. It hired twice the number of engagement staff, with more than half belonging to the Indigenous community, to work locally with Māori people. It partnered with organizations such as Te Matatini Society Inc. that fosters and protects Māori performing arts to spread awareness of

census activity. A fully bilingual census website, bilingual census forms, and other support (including call centre support) were available in the Māori language.[47]

B. The count is a first step toward systemic inclusion

46. Although understanding and acceptance of gender diversity and sexual orientation have grown over time, making it a part of the census exercise is important to acknowledge the evolving social and demographic landscape. In the 2021 census, the UK Office of National Statistics included sexuality and gender identity questions for the first time in the UK. The question was voluntary for individuals above the age of 16.[48]
47. To address privacy concerns, household members could ask for a separate questionnaire to ensure their answers remained confidential.[49] "The data could help decision-makers understand the extent and nature of disadvantage which people may be experiencing in terms of educational outcomes, health, employment, and housing," said Jen Woolford, director of the Office of National Statistics.[50] Including the community in the count is a first step toward greater social inclusion and helping them feel more seen and supported.
48. The US Census Bureau collects data on same-sex couples through the American Community Survey's Household Pulse Surveys. The 2019 survey counted nearly a million same-sex couple households. Fifty-eight per cent were married. The District of Columbia, Delaware, Oregon, Massachusetts, and Washington state had the highest percentage of same-sex couple households.[51] This level of detailed data helps to deepen the understanding of family composition, characteristics, and economic circumstances. Similarly, the Australian Bureau of Statistics also tracks same-sex marriage and plans to include new questions about gender and sexual orientation in the 2026 national census.[52]

VIII. Conclusion: Moving forward

49. Census agencies globally are on the brink of a major transformation in how they collect, analyze, and share data. Technological advancement, especially in AI, coupled with progressively improving data integration capabilities, could further democratize data in the coming decade. However, the primary challenge lies in maintaining data integrity—ensuring representation, reducing bias, and enhancing data security and privacy. Rebuilding trust in individuals and communities will help ensure census agencies can deliver on their mission.
    a. **Lead with trust:** A country's baseline public trust can impact the trust in government institutions like census agencies. However, this agency-level trust can still be strengthened irrespective of the overall trust in government. Focusing on data security and privacy, building systemic transparency on the collected data, and improving civic participation and engagement can help census agencies rebuild trust in their activities. Census agencies can tap into trust networks, including community organizations and influencers, to rebuild trust in certain communities.
    b. **Broaden the scope of administrative data:** Integrating data across government agencies and levels could be a step toward more holistic population insights. However, there may be an opportunity to broaden the scope by integrating private sector datasets, including social media, banking, and retail transactions.

This would require agencies to partner and develop agreements with such institutions. It can also provide opportunities to monetize data beyond research institutions and policymaking to drive business and economic value.

c. **More digital connections need more data protection:** Deloitte's digital government and citizen experience survey finds that concerns about privacy and security of personal data are some of the top challenges constituents face in accessing digital government services.[53] Census agencies should not only work to bolster data security but also build cybersecurity skills internally to improve the protection and security of data.

d. **Use technology to catalyze data transparency**: Census agencies should explore Generative AI solutions to help democratize census datasets for the general public and non-technical users by allowing them to retrieve knowledge through simple natural language questions.

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