

Population and Housing Censuses: An overdue and old-fashioned instrument or still a modern, severely needed and steadfast tool?

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Abstract. Following the release of the special issue of the Statistical Journal of the IAOS on Population and Housing Census, a platform was opened to discuss several topics related to the census, such as the definition of the census, the methodologies and technologies used to conduct a population and housing census. In particular, in a context of increasing access to administrative data, the relevance of the traditional census was discussed, in regard to its huge cost. Finally, the impact of the Covid-19 pandemic on the censuses planned for the years 2020 and 2021 was raised as monitored by international organisations.

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On March 2020 was released the special issue of the Statistical Journal of the IAOS on Population and Housing Census. The issue gathered a large number of articles providing a worldwide overview of census methodologies and technologies. Simultaneously, a discussion was opened on the SJIAOS discussion platform, kicked off via questions around 4 themes: about the definition of a census, its methodology, the relevance of census taking and the census technology. A provocative statement was introducing the discussion to tease up and foster contributions: *in an era of increasing access to administrative data as well as private sector data, including big data, is the census an overdue and old-fashioned instrument, costly and lengthy to deliver results, or still an indispensable tool?*

The discussion raised interest and several contributors expressed their opinions, sometimes divergent, on the topics proposed.

1. How to define a census according to its main characteristics...

The first topic for discussion was about the definition of a census. The UN define a population census as

“the total process of planning, collecting, compiling, evaluating, disseminating and analysing demographic, economic and social data at the smallest geographic level pertaining, at a specified time, to all persons in a country or in a well-delimited part of a country.” [1]. In addition to this definition, the UN identifies essential features of population and housing censuses: *individual enumeration, universality within a defined territory, simultaneity, defined periodicity and small-area statistics*. The latter was introduced in the revision 3 of the UN Principles and Recommendations for Population and Housing Censuses. The question proposed for discussion was whether these criteria were still relevant as essential features of a census.

According to contributors, individual enumeration is still one of the key features of a census, and no other statistical operation has been able to replace it. Universality is also an essential feature as population censuses have a universal scope and cover an entire population in a given period, including population groups that may not be subject to administrative registration such as street population.

Simultaneity is pointed out as an important feature of the census allowing for a photographic description

of the population at a specific point in time. This refers rather to the traditional way of conducting a census, canvassing the territory during a limited period of time. Other methods, such as a register-based census or rolling census are viewed as not fulfilling this characteristic. However, one could consider that a photo updated only every 10 years is less relevant than a “film”, even imperfect, that shows continuous evolutions. Techniques exist to calibrate observations collected at different dates to a single date, as for example in the case of “rolling censuses”.

Regarding periodicity, the 10-year periodicity as recommended by the UN is one of the features that might be insufficient in the face of rapid social changes. This is a critical issue in the design and establishment of medium- and long-term policies, that can be partly mitigated through intercensal surveys. Some contributors consider that there are good prospects for getting census data more frequently and in addition to a more affordable price as National Statistical Offices are utilising administrative sources to a larger extent. They also highlight progress in integrating statistical and geographical data as well as research going on utilising totally new sources for official statistics and accordingly developing new forms of cooperation and new methodologies. The importance of international cooperation is emphasized as paving the way for internationally comparable statistics.

Finally, the ability to produce small area statistics is reported as a key feature of censuses as countries have experienced a growing demand for regional and small area statistics. Statistics of high granularity in terms of content and geography are an important tool in running a city, advancing economy, social well-being and sustainability in a region, empowering citizens and local communities. Everyday life is local and thus small area statistics come close to citizens lives and their living and working areas. In addition, the rapid urbanisation and globalisation put an emphasis on the availability of comparative statistics on nations, regions and cities.

2. ... is it the unique methodology or the outputs

However, the recent introduction of this last feature “ability to produce small area statistics” brings a new question: What defines a census, is it the unique methodology or the outputs? Opinions are diverse on both items: some contributors consider that the “unique” methodology is the hallmark of the census while others consider that any operation able to provide

small area statistics while respecting the five essential features can be considered as a census. The question is then, what is the census “unique” methodology? Is it the traditional way of canvassing the territory during a short period of time going door to door to interview inhabitants or have them self-enumerating? Are other methods such as using administrative sources valid? Several contributors consider that the so-called “register-based” census, consisting in searching information in administrative records is not a valid one. For example, some people argue that the register-based census bears the risk of breaching the “universality” feature for not considering the population that – for some reason – is not part of these records, for example, populations in illegal migration, or homeless persons. Other stress that some information would be impossible to grasp through a register-based census.

Proponents of the traditional methodology list a number of problems hindering the quality of register-based censuses. Firstly, they recall that during the 2010 World Population and Housing Census Program, 214 countries carried out a census, only 21 did not, and only nine countries conducted register-based censuses. They consider that characteristics are not observed in a register-based census, instead they are constructed by using already existing information in registers. Secondly, they observe that in many countries there is a legal laxity for the transfer of administrative records to the national statistical offices, which does not help to establish a register-based census. Much of the transfer of administrative records by government agencies in European countries would be due to the goodwill of their current authorities, without having a legal obligation to do so, which makes this practice uncertain in the long term. This point is however contradicted by the legal obligation made to public authorities in many countries to provide access to their data to statistical authorities. This principle is also included in the European Statistics Code of Practice [2]. But the most valid criticism is probably that the register-based census is going against the statistical paradigm: it measures what it has, instead of defining a concept and then a method to measure it, as Desrosières defines it [3]. Another advantage of traditional censuses is that their methodology includes mechanisms for evaluating and verifying data quality. Until now, quality evaluation mechanisms for register-based censuses are in their first development stages.

For their part, advocates of register-based census think that the interviewers in a traditional census do not observe the characteristics of persons; they do not see age, level and kind of education or income. They ask

questions, and the answers are combinations of the true values plus measurement errors. While recognizing that errors in the recorded variables also exist in the registers, quality assurance procedures can be conducted by comparing register variables and sample survey variables for the same persons, such a post-enumeration surveys measure the coverage and content errors in a face-to-face census.

3. Do census methodologies require a scientific character?

The discussion also debated on the scientific character of the census methodologies. While the scientific basis of the classical or traditional census is well-established, and advanced methods have been developed to handle issues regarding coverage and other error sources, supporters of the traditional methodology argue that from the view of the scientific method, there is no theoretical methodology for register-based censuses, since it is not reproducible everywhere. One of the main reasons is the disparity in the development of the different countries, thus, while countries like Sweden or Denmark have very good administrative records, there are other countries that do not even have them. In general, there is not a standardization national or international of administrative records, plus a dubious quality of them.

On the opposite, its proponents consider that the register-based census also has a scientific basis. The new methods are developing and will gradually become established. The choice between the two methodologies should be based on a simultaneous judgment of costs and quality. Timeliness is the quality factor that is the main quality problem with the traditional census. They recall that when Northern European countries decided to move to a register-based census, several competent statisticians were negative about the change. The traditional census was ‘real statistical methodology’ and the quality survey regarding the census was ‘real quality assessment’. And all this would be lost when registers gradually replace the census! With this background, they said they can understand negative attitudes regarding the census, but that finally, money and quality will talk.

4. And what about the costs of a census ...

Speaking of money, one of the main criticisms to the so-called traditional census is its huge costs, for sending

thousands of trained enumerators canvassing the country to visit each and every household. Contributors were invited to give on the discussion platform their opinion on to what extent the limited use of census results, in particular for evidence-based policy making, is worth the huge cost? Respondents explained that the cost of the census should be assessed against its uses. The census is used for apportioning of budget resources, definition of electoral districts and therefore it also has to do with reapportioning seats in Parliament. For example, in Mexico, the cost of the decennial census represents only 0.1% of federal contributions over ten years for the states and municipalities of Mexico. Censuses are the main tool for government and other agencies to design, implement, and follow up public policies. The monitoring of many goals set by the SDG is also done with census data, either to measure the topic itself or to provide the denominator of SDG ratios. To cite just an example, its data serves to follow up the objective 11 on “Sustainable Cities and Communities”, particularly to assess the growth of the urban slick and of the low-stratum population with access to public transport. Census information has also proven its usefulness during the Covid-19 pandemic, where census data are useful in determining the location of the most vulnerable population by age.

5. Increased use of technology: is there a risk of weakening the field staff responsibility?

Technology is more and more used in censuses, allowing better quality, timeliness and control of the operation. Nowadays, the central census team can monitor the progress of data collection in each enumeration area of the country every hour. However, readers were asked their opinion about the risk of weakening the responsibility of the intermediate field staff (controllers, supervisors) in controlling and monitoring the quality of the work of the enumerators, and if they considered that human capital was still a major asset of a census or not.

The use of multimodal methods for data collection is widely spread: (i) CAPI (Computer-Assisted Personal Interviewing) is usually the main enumeration method; (ii) Paper questionnaires can also be used but only in specific cases; (iii) CATI (Computer-Assisted Telephone Interviewing) and (iv) CAWI (Computer-Assisted Web Interviewing) are also considered for self-enumeration, in countries or areas where the educational level of the population allows it. Individual and

unique QR codes to carry out a correct identification of each visited dwelling along with its precise geo-referencing information is also used, for example in Mexico. The main advantages of using technology are said to increase quality and timeliness, but also reduce costs. In Mexico, carrying out data collection operations with mobile computing devices is estimated to generate savings of up to US\$40 million, compared to the previous paper-based census. But behind the scenes, there are also key technological innovations used in censuses at different stages: conceptual, methodology, management, field staff training, real-time monitoring of operations, data dissemination, and last, but not least, technological architecture and information security.

While human capital is still regarded as very valuable for the census, some consider that very soon it will not be as such, either with self-enumeration or growing use of administrative sources to replace direct data collection.

6. The role of international organisations

Finally, the role of international organisations was raised. The United Nations Economic Commission for Europe (UNECE) since 2018 promoted work on the future of population censuses beyond the 2020 round. The UNECE Steering Group on Censuses produced a draft report that is currently under electronic consultation by the members of the Conference of European Statisticians. The report discusses basically all the themes mentioned above. The current draft of the report is available on the UNECE Census Wiki at: <https://statswiki.unece.org/display/censuses/Future+censuses+beyond+2020>.

7. The deconstructive role and challenges on census due to the pandemic

The effects of the Covid-19 pandemic on the 2020 round of Population and Housing Censuses are closely monitored by the United Nations Statistics Division (UNSD). The Division maintains a web page with information on the impact of Covid-19 on censuses planned in 2020: (<https://unstats.un.org/unsd/demographic-social/census/COVID-19/>). The article from Srdjan Mrkić in this issue titled “*Conducting population and housing censuses during the pandemic: An Overview*” [4] describes precisely how censuses that were planned in 2020 and 2021, which are the years recommended by the UN to conduct censuses, were affected by the pandemic and how countries adapted their initial plans. While provoking postponements and impacting severely the initial plans, he explains that the pandemic has also prompted countries to go more digital, relying increasingly on internet or telephone data-collection to limit interactions with the population, as well as making greater use of administrative sources.

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