UNFPA Strategy for the 2020 round of population and housing censuses (2015–2024)

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Abstract. The 2020 census round (2015-2024), is being implemented in a changing context, marked by widespread adoption of new technologies, increasing demands for disaggregated data for implementation of SDGs, capacity challenges in many national statistics offices, funding challenges, as well as conflict and unrest which are affecting census coverage in many countries. This article details the UNFPA strategy to ensure that everyone is counted, and accounted for, in the 2020 census round. The strategy responds to the changing contexts and builds on lessons learned in previous rounds. Within this framework, UNFPA provides technical and operational support (tools and capacity strengthening); promotes adoption of new and innovative technologies and methodologies; advocates for wider utilization of census data, including free and open access to data while ensuring confidentiality; leverages institutional partnerships at all levels for coordinated census support; strengthens resource mobilization, and advocates for the inclusion of questions on disability and migration to support efforts to leave no one behind.

Keywords: Census, data collection, analysis, dissemination, population, information technologies

1. Introduction

The population and housing census is among the most complex and massive peacetime exercises a nation can undertake. It requires mapping the entire country, mobilizing and training a large cadre of enumerators, public advocacy, canvassing all households, processing vast amounts of data with quality assurance, and analyzing and disseminating results. By definition, a population and housing census is an enumeration of the total population of a country, which provides data on numbers of people, their spatial distribution, sex and age structure, their living conditions and key socioeconomic characteristics. Such data are critical to national and sub-national development planning, tracking progress towards the Sustainable Development Goals (SDGs), the needed distribution of

infrastructure and social welfare investments, election planning and market analysis. The central role of the census within national data ecosystems will endure for the foreseeable future, despite recent advances in national registry systems.

The 2020 Census round (2015–2024), is the first census round since the adoption of the 2030 Agenda for Sustainable Development, and the corresponding 17 Sustainable Development Goals (SDGs) in 2015 by the United Nations General Assembly [1]. Recognizing the importance of data to track the fulfillment of the SDGs, governments agreed that by 2020, the global community would "enhance capacity-building support to developing countries, including for least developed countries and small island developing States, to increase significantly the availability of high-quality, timely and reliable data disaggregated by income, gender, age, race, ethnicity, migratory status, disability, geographic location and other characteristics relevant in national contexts" [1]. SDGs indicator 17.19.2 underscores the specific importance of census implementation, tracking the "proportion of countries that have

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conducted at least one population and housing census in the last 10 years" [1].

Enhancing national data systems by 2020, including an adequate census, was intended to assure that all countries would have the required data to identify SDG baselines, as 98 of 232 indicators require population data for estimation. Hence, it is critical that all countries successfully participate in the 2020 census round in order to generate SDG baselines, against which progress can be measured in the 2030 census round.

To facilitate United Nations (UN) support for the 2030 Agenda at country level, the UN has adopted a UN Sustainable Development Cooperation Framework (UNSDCF). The UNSDCF underscores the need for UN Country Teams to undertake a Common Country Analysis (CCA), in which UN agencies collectively examine the progress, gaps, opportunities and bottlenecks to a country achieving the 2030 Agenda. The CCA provides evidence and analysis of a country's development needs, and informs the UN's work in country. The CCA relies on timely and accurate population data to identify and locate those furthest behind in achieving SDG targets, and in countries without comprehensive and reliable registry data, the population and housing census is a crucial source of data on poverty, living conditions, status of employment, shortfalls in education, disability, and more. The census also documents the geographic distribution of persons of all ages, allowing a national mapping of social and economic conditions, and the location of those facing high risks of untimely death, including maternal death, and those experiencing harmful practices such as child marriage and early childbearing. Beyond development interests, the census underpins the generation of common operational data sets on population (COD-Ps) for humanitarian assistance, and provides the sampling frame for all national surveys.

The United Nations Population Fund (UNFPA) recognizes the critical nature of the census to inform national and subnational decision making, especially in countries with weak and incomplete registry data. Historically, and in line with its mandate, UNFPA has supported census data generation, analysis, dissemination, and utilization for development planning for 50 years, and in the UNFPA Strategic Plan 2018–2021, the organization committed to supporting governments to ensure that "everyone, everywhere, is counted, and accounted for, in the pursuit of sustainable development" [2].

Ensuring that everyone is counted and accounted for is ultimately the responsibility of each national government, and UNFPA's support aims to ensure that governments achieve this critical responsibility. In the 2010 Census round, the most successful census round to date, UNFPA provided support to over 130 countries, managing contributions totaling more than 300 million United States dollars [3]. Activities in support of census are conducted in cooperation with a wide range of technical and financial partners, including the US Census Bureau, the UN Statistics Division, Regional Economic Commissions and numerous bilateral and multilateral donors, including the World Bank. UNFPA technical and operational support ranges from policy dialogue to advocacy, technical assistance, advice, capacity development, procurement of equipment or services, financial management, coordination of south-south cooperation, and reporting of results [4].

The 2010 census round pioneered a wide variety of technology solutions for census data collection, analysis and dissemination. These solutions ranged from the use of the internet, laptops, hand-held or tablet computers, Geographic Information Systems (GIS), and scanning and recognition systems. The 2020 census round has witnessed a dramatic adoption of these new census technologies, with the majority of countries using handheld devices for mapping and data collection in this round. The new technologies are associated with improved data quality, faster processing, and much faster release of census results. As innovative approaches are implemented for census and the overall census exercise is modernized, there must be corresponding investments in a nation's internet coverage and overall capacity in information technology, and the full use and interpretation of GIS data. These investments must also focus on the National Statistics Offices (NSOs), as many NSOs in developing countries experience high turnover and low retention of qualified technical staff throughout the census lifecycle. These constrained capacities contribute to a reduction in operational planning, delayed release of census results, and limited in-depth analysis and/or utilization of data.

As the 2020 census round progresses, an increasing number of countries are experiencing or at risk of experiencing insecurity and/or unrest that affects the implementation of census. Furthermore, humanitarian emergencies create complex environments where the demand for population data is high, while simultaneously hindering the collection and use of such data. However, new methods have been developed to generate population estimates where traditional census enumeration cannot be conducted due to inaccessibility.

2. The 2020 round strategy

In the 2020 census round, UNFPA remains committed to providing high quality technical and operational support to ensure that everyone is counted. The goals of the UNFPA strategy are to: a) strengthen the capacity of national statistical systems to collect, process and disseminate georeferenced census data; and b) assure full utilization of census data to inform and monitor the achievement of subnational, national and global development agendas. The UNFPA strategy is focused on promoting the full modernization of censuses, including the transition from paper-based to computer assisted personal interviewing (CAPI); digitized national mapping systems; electronic data transmission, management and dissemination; and the use and integration of georeferenced census data with other geospatial data. While modernization requires an upfront cost, it provides many advantages including overall reduced costs, improved data quality, more timely dissemination of results and greater utility of data.

A modernized census can also have a multiplier effect on the entire national statistical system, thereby increasing the overall benefits of such investments. By creating a baseline of georeferenced census data to underpin the national statistical system, other components of the national statistical system benefit in the process, as data integration through GIS offers the potential of combining numerous types of data, and extracting greater value from data in the process.

Within this round, UNFPA has identified key transformative technologies for the modernization of the census. These key technologies include the use of handheld devices, the integration of GIS into census and digital mapping, and generation of modelled population estimates.

2.1. Advocacy for use of Handheld devices with Global Navigation Satellite System (GNSS)

In its efforts to support the modernization of census, UNFPA strongly advocates for the use of handheld devices with embedded GNSS for data collection. Use of these devices enables geo-tagging the location of data collection and generating high-resolution georeferenced population data. Geo-located national data is a transformative addition to a nation's statistical system. It enables a government not only to map settlements, households, and infrastructure, but also to analyze and display the spatial differentials of all census data. In turn, such analyses enable policymakers, the

UN, civil society and all users of census data to locate those furthest behind. The geographic disaggregation of census data at high resolution, including SDG indicators, facilitate more targeted investment and policy development where needs are most extreme.

2.2. Integrating GIS in census and digital mapping

UNFPA prioritizes the application of GIS and GNSS to improve the accuracy of boundary data, the quality of census coverage, and to integrate complementary sources of geospatial data with population and housing census data. Moreover, GIS enables a nation to compare their census data over time, as it provides raster data, which is independent of changing administrative boundaries and enumeration areas (EAs). The ability to analyze census data over time, based on the raster data, can vastly improve the resulting information about location-specific population trends and projections.

2.3. Advocating for greater/wider use of georeferenced census data

The benefits of georeferenced census data include, but are not limited to, the potential it offers for integrating multiple sources of geospatial data and the foresight to map population data at low levels of analysis to identify vulnerabilities. Geospatial population data can be effectively combined with any other data source that is also geo-referenced, opening new avenues for analysis, and the potential to answer important development questions, such as:

– *Spatial clustering*: the extent to which development shortfalls or advantages are spatially clustered in defined areas, e.g. settlements, neighborhoods, communities;
– *Access*: how topography, roads or environment are affecting access to employment, or to critical services such as schools or health facilities;
– *Environmental and disaster risk*: which communities or populations are at risk of drought, floods, rising sea level, extreme weather or other threats of climate change or potential environmental crisis;

Likewise, the integration of multiple and diverse types of geospatial data can greatly improve the precision of population modeling and estimation in defined areas, with broad applications for:

– *Population modeling and estimation in remote and inaccessible areas*: The potential to combine ground truth survey data with remote sensed data provides an important means for improving population estimates between censuses or in remote areas where surveys are difficult; thereby improving sub-national population projections (see *Modelled Population Estimates*, below);

– *Small Area Estimation (SAE) of development indicators:* With a sufficient number of common predictive variables, census can be combined with granular surveys and registry data to predict indicators in defined areas and at lower geographic levels than would be otherwise available from use of one source alone. Such approaches can be especially useful in countries that have not executed a long, traditional, comprehensive census, but for reasons of cost or timing have undertaken a short-form, or "light" census.

– *Mapping population movements and shifting settlements:* Through periodic and repeat population estimates in defined areas, it is possible to improve data on refugees and displaced persons in line with the UN International Recommendations on Refugee Statistics [5] and the UN/Eurostat Technical Report on Statistics of Internally Displaced Persons [6].

2.4. Advocating for questions to leave no one behind [7] (LNOB)

The 2030 Agenda introduced a high bar for national governments to disaggregate population data by at least eight strata, including common strata such as age or sex, but adding categories on migration status and disability status, which have long been neglected in the traditional population census. The 2020 round of census offers a unique opportunity to promote the inclusion of relevant questions on migration and disability status in standardized formats, so that new data can be generated on the well-being of migrants and persons with disability, and these data can be compared between countries. UNFPA systematically advocates for the inclusion of the three core questions on migration status as recommended within the U.N. Principles and Recommendations for Population and Housing Censuses, Revision 3 [8, pp. 204–206], which include: country of birth, country of citizenship and year or period of arrival. In addition, and in line with the Global Compact for Migration, UNFPA is committed to improving national data collection by supporting the

integration of the following questions in national censuses, including country of birth of parents, country of residence five years prior to the census, and reason for migrating [8].

For disability status, UNFPA advocates for inclusion of the Washington Group questions on disability status [9], which allows for the identification of six domains of functionality:

– Do you have difficulty seeing, even if wearing glasses?

– Do you have difficulty hearing, even if using a hearing aid?

– Do you have difficulty walking or climbing steps?

– Do you have difficulty remembering or concentrating?

– Do you have difficulty (with self-care such as) washing all over or dressing?

– Using your usual (customary) language, do you have difficulty communication, for example understanding or being understood.

2.5. Advocating for questions on civil registration

Global knowledge on the coverage of birth registration in countries has been widely advanced by the inclusion of key questions on whether or not a birth was registered within common household surveys, such as the Multiple Indicator Cluster Survey (MICS), and the Demographic and Health Surveys (DHS), as advocated by UNICEF in Every Child's Birth Right: Inequities and trends in birth registration [10].

No comparable effort has been made to assess the global coverage of marriage or divorce registration, but throughout this census round, UNFPA has been systematically advocating for inclusion of questions on both type of marriage, and whether or not a marriage or divorce was formally registered. In small-scale studies, marriage non-registration has been identified as a unique vulnerability for women, particularly widows and women abandoned by their husbands, with non-registration leaving women more vulnerable to loss of assets, or loss of child custody. Inclusion of questions on whether or not marriages or divorces have been registered will not only improve global knowledge on the coverage of marriage and divorce registration, but enable analysis of associated vulnerabilities.

Further, the inclusion of questions on registration of vital events within the 2020 census round will expand opportunities for cross-validation of Civil Registration and Vital Statistics (CRVS) systems and census data, facilitating assessments of CRVS coverage and quality.

2.6. Promoting wider dissemination of census data, while protecting privacy

UNFPA advocates for free and open access to population census data through user-friendly portals, dashboards and GIS-based platforms, while assuring privacy and confidentiality of individuals and communities. This advocacy begins with a review of legislative frameworks to promote data sharing and utilization, and opportunities for modernizing such legislation in light of both demands for greater access to public data, and the recognized potential for violations of personal privacy through the combined analytics of modern data systems. For many countries, legislation that limits access to census data is increasingly outdated for balancing these dual demands for access and privacy, especially as it applies to geospatial data, satellite imagery or remote sensing. UNFPA is increasingly working with UN partners, public and private-sector advisors and related experts to support governments in legislative reform, and promoting government-to-govermnent exchanges in best practices in information technology that both improve access to census information for governments, civil society, the private sector and the public, while protecting the privacy of individuals, households and communities. As data systems continue to evolve, there will be a continuous and evolving need to advance systems that assure both access and privacy.

2.7. Generating modelled population estimates, where needed [11]

In countries that are coping with conflict or political insecurity, and may have highly stressed remote or inaccessible areas, complete census enumeration may be impossible to achieve. This may leave some countries with areas for which demographic data will be entirely missing or incomplete. In addition, large population displacements, often the result of conflict and insecurity, may have rendered past census information out of date. In such environments, advances in satellite imagery, geo-positioning tools, and statistical methods, combined with computational power, enable the application of innovative approaches to estimate population distributions at fine spatial scales [12].

The modeling methodology allows for the generation of spatially disaggregated population estimates through statistical modelling based on existing enumeration data, micro-census surveys, and satellite imagery. By overlaying data layers, including imagery associated with known population densities, estimates can be produced for populations that have otherwise been excluded in conventional enumeration. Importantly, the resulting population estimates include estimates of uncertainty, which vary depending on the quality and timeliness of available ground data and satellite imagery. The modelling method can be transformative for areas that may have never been previously enumerated, allowing settlements and populations to be counted that would otherwise be left behind, or entirely invisible. This methodology was piloted in Afghanistan in 2015, in partnership with WorldPop and the Flowminder Foundation. Since 2015, UNFPA, WorldPop and Flowminder have been supporting its use in a range of countries, and the recent Geo-Referenced Infrastructure and Demographic Data for Development (GRID3) partnership [13] is facilitating the delivery of such methods to relevant countries.

Modelled population estimates can also be used for quality assurance purposes, for example, by providing estimates in areas that experienced under-coverage during the census. These estimates, can verify the quality and coverage of the census in the post enumeration phase of the census lifecycle. This verification can be critical for the national ministries responsible for the census in cases where results vary greatly from previous counts. In areas of under coverage, the modelling method can be critical to producing estimates, especially if under coverage was due to issues such as resource availability or insecurity. Lastly, modelled population estimates can be produced during the intercensal period, which may be useful for updating settlement maps and sampling frames, and assist in the overall planning and cartography of future censuses.

Transformative as these modelled population estimates can be for inclusivity in countries with long delays between censuses, or widespread areas without enumeration – population estimates alone, even with inferences on the likely age and sex of populations, are limited for development, and for advancing progress towards the SDGs. None of the richness in social, economic or development data required for monitoring progress in achieving the SDGs, or for understanding the complex needs of people, are possible through the modelled population estimates. As such, population estimates offer a valuable but insufficient source of data for development, and cannot replace the value of traditional census or registry data for evidence-based governance.

2.8. Supporting the transition to register-based censuses, where relevant

Within the 2030 Agenda, it is evident that the population census and national registers are critical to the accurate tracking of the SDGs. Within this scope, UNFPA supports the transition to register-based censuses, where relevant, to compile comprehensive national data about every individual's vital events. For the foreseeable future and for countries where registers are not relevant, the census will remain the primary source of population data for development. But in contrast to census, registry-based data offer a more continuous flow of data on vital events, health, education, employment, income, and other dimensions of life relevant for development. By employing a population registry with common identifiers, governments can combine such sector-specific data to accumulate all relevant data on a single individual, and thereby generate a registry-based census. In a growing number of countries, particularly registry data-rich OECD countries, this is becoming the norm, with register-based censuses produced at intervals more frequent than the traditional decennial census.

Whether or not registry data are combined for a registry-based census, UNFPA promotes the strengthening of civil registration and health registry data, and supports government-government exchanges to learn about the requirements for a registry-based census.

The transition from a traditional to a registry-based census requires substantial investments, legislation for integrating sector specific data, and public agreements on the use of common identifiers that will allow governments to combine personal information from different sectors. Where such a system has public and legislative support, the transition process begins with the development of the population register for all vital events of every individual residing within a nation's boundaries, and progresses to include sector-specific data. In some countries, public trust in government is insufficient to support the ability of government to combine sector-specific data, and national legislation prohibits the use of a population register.

In the 2020 census round, select countries are exploring their operational potential for a registry-based census by conducting both a traditional and a registry-based census, with plans to compare the outputs to identify the coverage shortfalls in the registry system; such data will allow them to improve registry coverage, and ultimately, transition to a registry-based census in the 2030 census round if legislation allows. UNFPA supports government-to-government exchanges on these developments.

2.9. Strengthening governance and quality assurance

UNFPA has identified the following eight key areas of focus to improve census governance and quality assurance: 1) support the establishment of functional International Technical Advisory Boards and National Advisory Boards/Committees; 2) advocate for the adoption of effective donor coordination mechanisms; 3) advocate for the establishment of a peer review roster to facilitate timely review of census project documents and questionnaires; 4) support the translation and global dissemination of UN Statistics Division's international principles and recommendations for population and housing censuses and the use of global census guidelines and standards; 5) facilitate user consultations, including for civil society (CSOs); 6) provide guidance on conducting local census context analysis, including for religious and cultural contexts, political risk assessments, and related issues in fragile and humanitarian contexts; 7) advocate for post enumeration area surveys to measure coverage and data quality [14] and 8) generate modelled population estimates to address census under coverage in inaccessible areas or areas where enumeration coverage is not complete.

3. Tools and actions

In line with SDG Target 17.18, and the goal of the strategy, UNFPA support to the 2020 census round centers on strengthening the capacities of NSOs to successfully implement the 2020 census round, including capacity to collect, process and disseminate geo-referenced census data; and to assure full utilization of census data to inform and monitor the achievement of subnational, national and global development agendas. The capacity strengthening takes a variety of forms depending on the specific needs of countries. To ensure efficient delivery of capacity strengthening in this census round, UNFPA has adopted the following approaches:

3.1. Tools and guidelines

UNFPA produces and disseminates technical guidance tools that are aligned with international standards. These guidance tools ensure that each UNFPA Regional and Country Office provides uniformed and technically sound advice and support to every NSO that solicits assistance. Furthermore, the offices ensure

that previously developed international standards on how to plan a census, resource mobilization, user consultation, political risk assessment, innovative methods, field management, post-enumeration surveys, and data quality evaluation are disseminated in a strategic, global effort. UNFPA training materials, technical briefs, webinars and guidance notes readily available on UNFPA's website to ensure global access.

3.2. Regional workshops

Each year, UNFPA conducts 4–6 regional census methodology workshops targeted for representatives from NSOs in UNFPA programme countries. Regional workshops are focused on region-specific capacity needs and different stages of census, feature government-government exchange, and include experts from partner organizations.

3.3. On-going technical advice

Through its network of offices at the national, regional and global level, UNFPA provides mission support to countries, and on-going technical guidance to NSOs.

3.4. Chief technical advisors on census

Throughout the 2020 round, UNFPA is committed to increasing the recruitment, roster training and deployment of Chief Technical Advisors (CTA) on Census. The deployment of a CTA can greatly enhance a country's capacity to conduct a census. Ideally, a CTA is deployed to a country for two to three years: first to provide support during the planning phase of the census, then to assist during the actual implementation of the census and finally to ensure that the census data is produced, accepted, and utilized as part of government's evidence-based development programming. The allocation of a dedicated expert to a country for the census exercise ensures that existing capacity gaps can be efficiently resolved and reduce delays in implementation.

3.5. Population data fellows

UNFPA has launched a Population Data Fellows Programme to support experiential learning among young population data experts, and thereby contribute to the future sustainability of strong population data systems. By investing in the next generation of population data, civil registration and census experts, UNFPA

seeks to reduce both current and future capacity gaps in the modern census expertise, and promote better use of the resulting data for the public good. The rate at which new technologies and methodologies are developed and deployed to countries requires a global structure for investment in young professionals.

3.6. Operational support

UNFPA has deepened its engagement with governments to improve reliable fiscal management for census, reduce financial and operational risk, and facilitate timely procurement of both equipment and software. With the organization's global presence and census expertise, UNFPA brokers the securing of satellite imagery, equipment and software for census. Through involvement in national procurement processes, UNFPA assures industry standards and best practices, especially for novel equipment or software.

3.7. Leveraging institutional partnerships for more effective and coordinated census support

The UN Statistical Division (UNSD) and UNFPA maintain a complementary division of labour for census support to Member States. While UNSD oversees the production of the UN Principles and Recommendations for Population and Housing Census and the Handbook on the Management of Population and Housing Censuses and convenes global partners for the periodic update of these documents, UNFPA oversees in-country technical support to governments through UNFPA country and regional offices. In preparation for the 2020 census round, the *International Committee on Census Coordination* (ICCC) [15] was re-established, as a vehicle for quarterly exchange between UNFPA, UNSD, the U.S. Census Bureau (USCB) and the World Bank, to review the status of census in countries, and coordinate support. UNFPA and USCB have a Memorandum of Understanding (MoU) to simplify procurement of USCB's technical assistance within UNFPA programme countries, and UNFPA collaborates with both UNSD and UN Regional Commissions on regional census methodology workshops, and to assure adequate support for NSO staff participation in census training.

3.8. Brokering south to south support

South-South learning is a powerful mechanism to improve the national census, fostering regional problem-solving, and exchange of technical expertise and

commodities between countries facing similar constraints. In the 2010 round, the Government of Brazil shared tablets and CAPI methodologies with Senegal and Cape Verde at huge cost savings, and similar exchanges are underway within the 2020 round. UNFPA supports such commodity sharing, as well as national study tours between countries, which often lead to sustained partnerships. Countries participating in formal exchanges include Brazil, Cape Verde, Congo Brazzaville, Cuba, Democratic Republic of Congo, El Salvador, Ethiopia, Malawi, Senegal, Zambia, among others.

4. Conclusion

For 50 years, UNFPA has supported population and housing censuses, as the foundation of national statistical systems. With each passing census round, new technologies and approaches have demanded a recalibration of technical support to countries, which has resulted in progressive improvements in the speed of implementation and the quality of resulting data. The 2020 census round represents a unique leap forward in the transformative modernization of census, including the use of digital cartography, CAPI, and inclusion of geospatial data. UNFPA aims to maximize its support through streamlined systems that were developed from best practices and lessons learned in past census rounds.

Every individual deserves to be counted, and accounted for, especially in development planning and the monitoring of global progress in achieving the SDGs. Without population data, global progress towards achieving the SDGs would be implemented in a vacuum. The decennial census shall not be used as a political process; but as a function to count every person in a given country, territory or area. While the value of census data is unequivocal as the basis for political apportionment and representation, the census conduct itself must be strictly nonpartisan and nonpolitical, to ensure the human rights of each individual to be counted. Concerted effort must be made to ensure that all countries successfully implement the census exercise in this round, following international standards and principles, and UNFPA stands at the forefront in supporting this global goal.

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