



DEMOGRAPHIC OBSERVATORY
Latin America and the Caribbean

2021

The 2020 round of population and housing censuses in Latin America and the Caribbean amid the pandemic

Regional overview
and pressing challenges



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COVID-19
RESPONSE

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Foreword

The Latin American and Caribbean Demographic Centre (CELADE)-Population Division of the Economic Commission for Latin America and the Caribbean (ECLAC) is pleased to present its readers with this edition of the *Demographic Observatory*, which analyses the impact of the coronavirus disease (COVID-19) on the population and housing censuses of the countries of the region, based on information available until October 2021.

The information used to prepare this edition of the *Demographic Observatory* corresponds to data collected in surveys conducted by the World Bank and the United Nations Statistics Division in coordination with the United Nations regional commissions, and from interviews conducted with national statistical institutes and the reports of the various workshops organized in Latin America and the Caribbean, where the consequences of the COVID-19 pandemic were incorporated into the 2020 round of censuses in the region.

Moreover, as the pandemic is still ongoing, some of its effects on census processes were not observed while this document was being prepared. These effects will continue to be seen even after the pandemic is over, owing especially to the short period in which changes in census processes were carried out and to the budget cuts required, which may have an impact in the longer term.

This edition of the *Demographic Observatory* seeks to summarize the impact of the pandemic on the conduct of population and housing censuses, identify possible areas of action to obtain relevant information in support of policies and programmes aimed at overcoming the difficulties caused by the pandemic, and measure the effects of the crisis on the population.

This publication, as well as previous editions, is available on the website of CELADE-Population Division of ECLAC (<https://www.cepal.org/en/publications/type/observatorio-demografico-america-latina-demographic-observatory-latin-america>).

Simone Cecchini

Chief

Latin American and Caribbean Demographic Centre (CELADE)-
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Introduction

Since the 1960s, the Latin American and Caribbean Demographic Centre (CELADE)-Population Division of the Economic Commission for Latin America and the Caribbean (ECLAC) has been supporting the national statistical institutes of the countries of the region in the planning, execution, analysis and dissemination of population and housing censuses. Population censuses are fundamental for understanding national and subnational population dynamics and those of specific population groups. Housing censuses, meanwhile, provide information on the number of existing housing units, as well as their structural characteristics, services and facilities (United Nations, 2010). These data, together with population data, provide information on living conditions, housing deficits and other indicators. Several countries in the region have had difficulty following the international recommendation to conduct censuses every 10 years and, if possible, in years ending in the digit 0. From the 1950 round of censuses¹ to the 2010 round, 21 countries in Latin America and the Caribbean (55% of the total) have conducted all censuses, most of them in years ending in 0 or 1.² Other countries have conducted six of the seven censuses, in an attempt to maintain the periodicity of a decade, and the rest have conducted five of the seven censuses (four in the case of Haiti), with no periodicity or standardized census years. Despite the efforts made, three countries in the region have not conducted censuses since 2010: El Salvador (2007), Haiti (2003) and Nicaragua (2005). The disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), known as coronavirus disease (COVID-19), was declared a pandemic by the World Health Organization (WHO) on 11 March 2020, when the institution reported 4,291 deaths and 118,000 cases in 114 countries (WHO, 2020). COVID-19, which shocked the world in 2020, coincided precisely with the year 0 recommended for conducting censuses, so through different initiatives, the United Nations, ECLAC and the United Nations Population Fund (UNFPA) immediately set about evaluating, together with national statistical institutes, the effects of the pandemic on statistical operations, and especially on census schedules, as a first step to create a common basis for evaluating the effects and implementing strategies and recommendations to address a new and uncertain situation.

It is in this context that CELADE-Population Division of ECLAC, within the framework of the Working Group on Censuses of the Statistical Conference of the Americas of ECLAC and the Knowledge Transfer Network (KTN), and including the coordination of the National Institute of Statistics of Chile (INE) and the Statistics Division of ECLAC, convened national statistical institutes for four videoconferences to jointly evaluate the effects of the COVID-19 pandemic on population and housing censuses, and the strategies

¹ Nine Latin American countries —Argentina, Bolivarian Republic of Venezuela, Brazil, Chile, Dominican Republic, Ecuador, Mexico, Panama and Paraguay— conducted censuses in all rounds. Chile's 2012 census data were not made official and an abbreviated census was conducted in 2017. Three other countries in the region —Colombia, Guatemala and Peru— conducted their censuses in the five-year period 2015–2019, which corresponds to the 2020 census round.

² Census rounds cover the five years before and after the years ending in 0. For example, the 2010 census round refers to censuses conducted from 2005 to 2014 and the 2020 round refers to those conducted from 2015 to 2024.

being implemented by the different countries.³ The first meeting was held on 15 April 2020, when very little was known about the evolution of the disease, as a recognition of the severity and urgency of the situation, and in light of the swift realization that many of the exercises planned for 2020 and 2021 would have to be postponed. In parallel, other initiatives were strengthened to assist countries in making decisions regarding innovations in data collection methods, a process that has had to be accelerated owing to the demands of the pandemic. These initiatives may help ensure the quality of census data, another concern that has been noted in the region. The different initiatives include the document “Lineamientos generales para la captura de datos censales. Revisión de métodos con miras a la ronda de censos 2020”, which was prepared with the active participation of the statistical institutes of the Bolivarian Republic of Venezuela, Brazil, Chile, Colombia, Costa Rica, Ecuador and Mexico, within the framework of the Working Group on Censuses of the Statistical Conference of the Americas of ECLAC.⁴ In 2021, other virtual workshops were also held on the more conceptual aspects of online self-enumeration or the electronic census, such as the inclusion or not of the question on the identity document number, as a first step in advancing towards the use of administrative records for statistical purposes in censuses. Finally, the publication “Recomendaciones para los censos de población y vivienda en América Latina. Revisión 2020” was made available to all national statistical institutes in the region. This document includes an update on the recommendations regarding thematic census issues for the 2010 round, and also some specific suggestions related to the COVID-19 pandemic.⁵

In 2020, the World Bank and the United Nations Statistics Division, in coordination with the United Nations regional commissions,⁶ designed and implemented a three-phase global online survey targeting national statistical institutes to assess the effects of the COVID-19 crisis and identify needs for technical and financial support. In addition, the United Nations Statistics Division, charged with fulfilling the responsibilities of the Secretariat of the 2020 World Population and Housing Census Programme, surveyed countries that had originally scheduled a census for 2020 and 2021 to obtain information on how COVID-19 was affecting them (United Nations, 2020).

In Latin America and the Caribbean, only Aruba and Mexico were able to carry out their censuses in 2020 and, although some countries initially postponed the census to 2021, they later had to postpone it to 2022. This was because of both continued health restrictions and budget cuts or difficulties in complying with all the processes related to the pre-census stage, such as mapping updates, pilot tests and training. These postponements were also related to the uncertainty regarding the real possibilities of collecting census information through face-to-face interviews and of applying monitoring and quality control methodologies.

At the same time, the fight against the COVID-19 pandemic has shown the importance of having timely and quality information to determine its impact and to develop care and mitigation programmes, as well as targeted strategies based on the progress and intensity of the disease in specific population groups. The week-by-week measurement of pandemic behaviour in communities and neighbourhoods in large cities is a clear example of the need for disaggregated, timely and quality data on population, morbidity and mortality, by age and sex. The same need exists for ethnic groups and populations experiencing different forms of vulnerability.

The pandemic also changed international migration flows, modified internal migration patterns, abruptly increased mortality—which was high among older persons during the first year, but which over time has also risen among the youngest age groups—and has had different effects on fertility. As regards fertility, the confinement of most of the population may have resulted in more limited access to contraceptive methods, which could have led to an increase in births, while the suspension of other reproductive health services, such as assisted reproduction, may have resulted in a reduction in births of babies conceived with such treatments. At the same time, some couples may have decided to avoid pregnancy in the face of adverse circumstances or have postponed pregnancy owing to separation, whether voluntary or involuntary, or because of the termination

³ For more information on the meetings and documents presented, see [online, in Spanish] <https://www.cepal.org/es/temas/censos-poblacion-vivienda/impactos-covid-19-censos-poblacion-vivienda> and [online] <https://rtc-cea.cepal.org/en/conectados-rtc>.

⁴ See [online] <https://www.cepal.org/es/publicaciones/47483-lineamientos-generales-la-captura-datos-censales-revision-metodos-miras-la-ronda>.

⁵ See [online] <https://www.cepal.org/es/publicaciones/47562-recomendaciones-censos-poblacion-vivienda-america-latina-revision-2020>.

⁶ Economic Commission for Latin America and the Caribbean (ECLAC), Economic Commission for Europe (ECE), Economic Commission for Africa (ECA), Economic and Social Commission for Asia and the Pacific (ESCAP) and Economic and Social Commission for Western Asia (ESCWA).

of the union. All these elements change the trends in the components of population dynamics at the national, regional and local levels, and make it necessary to determine the post-pandemic structure of the population by age and sex, as well as to identify changes in its territorial distribution, which translates into a new baseline and new hypotheses about the future trend in population dynamics, and a revision of population projections.

It is important to remember that the number of people in each subgroup constitutes the population at risk of experiencing the demographic and social events presented. Therefore, it is the denominator of mortality, fertility, migration and other rates, such as education coverage, social security and access to digital technologies, which makes it fundamental for the design, monitoring and evaluation of public policies. Population censuses are the main source of demographic information in Latin American and Caribbean countries, and the only source for measuring internal migration and the territorial distribution of the population. In addition, they provide elements that complement the measurement of fertility and mortality.

The fight against the pandemic illustrates the debate on the potential of censuses and makes governments and civil society aware that it is essential to schedule them as soon as possible and to carry them out properly and promptly in order to provide decision makers with crucial information for health and crisis recovery policies. Countries should make every effort to carry out the next population and housing censuses before 2025, in order to be in line with the 2020 round, not only because the world is expected to reach a new post-pandemic normal, but also because it is essential to determine the new age and sex structure in order to be able to make new population projections that are sufficiently reliable.

Household surveys are another important source of data, and not only in the demographic field. The census also plays a very important role in establishing the sampling frame. If surveys are conducted on the basis of an outdated framework, they have a high probability of being biased and of resulting in erroneous public policy design. The quality of the population and housing census, in terms of the complete enumeration, identification and characterization of dwellings, households and persons, is a fundamental element for the design of household survey samples.

The purpose of this paper is to take stock of the situation of the 2020 round of population censuses in the region, determine the impact of the COVID-19 crisis on census processes and to learn about the different strategies adopted to carry out population censuses in the context of the health emergency and identify their potential to provide fundamental information for mitigation and recovery policies.

In addition to this introduction, the document includes a first chapter which analyses population and housing censuses in the context of COVID-19 in Latin America and the Caribbean, by reviewing the surveys of the United Nations Statistics Division (United Nations, 2020 and 2021b) and the World Bank, as well as the initial actions carried out by CELADE-Population Division of ECLAC to evaluate the impact and to learn about the strategies that the countries of the region were adopting. Chapter II presents the situation of Latin American and Caribbean countries regarding the conduct of population and housing censuses for the 2020 round, and distinguishes between countries that conducted the censuses before the pandemic, those that conducted them during the pandemic, those that had to postpone them, and those that, so far, plan to conduct them after the pandemic. A brief summary of the characteristics and main difficulties faced by each country is also presented. Second, a very brief reference is made to the experience in Spain with record-based censuses and the incipient use of administrative records in the region to obtain demographic data, correct census data and begin to move forward on the long road of record-based censuses.

Chapter III discusses the possibilities of including questions and conceptual adjustments in the questionnaires for the 2020 census round, such as questions on change of residence and deaths in the household in a reference period longer than 12 months. These questions may be relevant and included in the questionnaires of countries that traditionally do not ask them, because they may help to pinpoint the impact of COVID-19 on mortality. The chapter also discusses the possibility of including other questions, such as those related to access to and use of information and communications technologies (ICTs), which may help to understand the consequences of the pandemic and to improve recovery policies. Chapter IV addresses issues related to the design and implementation of online self-enumeration in Latin America, especially the implementation of self-response, the adaptation of questions to the online self-enumeration format and the quality of self-enumeration, among other issues. Finally, Chapter V presents the conclusions, with a review

and brief recommendations for future censuses, based on the experience and analysis of the document. It highlights the challenge imposed by the pandemic to adopt technology in population and housing censuses faster than originally planned, but always ensuring the quality of the process and without risking the census, so great emphasis must be placed on carrying out all the necessary tests and in all areas. At the same time, the chapter highlights the need for a sufficient budget and to begin to advance gradually in the integration of the use of administrative records, taking into account that the scenario in the region is diverse, so each country faces different situations and structural conditions, and there is no one-size-fits-all solution. Each country will have to determine the best alternatives to ensure that censuses are carried out promptly, while safeguarding the health of the census takers and of the population, and guaranteeing the quality of the census.

I. Population and housing censuses in the context of COVID-19 in Latin America and the Caribbean

The population of Latin American and Caribbean countries has had to face new and unexpected realities as a result of the coronavirus disease (COVID-19) pandemic, on top of different socioeconomic situations, political instabilities, confrontations and civil discontent. This combination of factors is forcing government institutions, regardless of their political regime, to pursue the most suitable responses to pressing problems of population survival and of ensuring a minimum quality of life. What is more, these circumstances are affecting a continent characterized by inequality, high rates of labour informality, job insecurity, social discrimination and, in several countries, low or modest levels of development.

The national statistical system (NSS) of each country should provide vital support, not only to implement public policies formulated under constitutional mandates and the corresponding development plans, but also to enable the academic and private sectors to base their research and strategic decision-making on information that is as timely and reliable as possible. The technical entities responsible for directing and maintaining NSSs must ensure the different databases are of high quality and properly integrated.

National population and housing censuses remain the backbone of social statistics systems, at both the national and territorial levels, and form the basis for construction and calculation of all demographic and socioeconomic indicators, which are crucial for understanding the size, age structure, gender composition, growth, mobility and spatial distribution of populations. In each country, the entity responsible for designing, guiding and maintaining the statistical system in the most integrated way possible is the national statistical office (NSO), such as the National Institute of Statistics, Geography and Informatics (INEGI) of Mexico and the National Administrative Department of Statistics (DANE) of Colombia. In the context of the pandemic, national population and housing censuses have been severely affected by the restrictions that countries have had to adopt to attempt contain the spread of the virus.

The countries of Latin America and the Caribbean have conducted censuses relatively regularly over the last 70 years, performing at least five censuses each (with the exception of Haiti, which conducted four). Table I.1 provides a historical analysis of censuses in the region. Some six countries had censuses planned for 2020, to maintain the regular pattern of conducting censuses in years ending in zero. However, only Aruba and Mexico were able to do so.

Table I.1
Latin America and the Caribbean (38 countries and territories): census years, 1950 round–2020 round

Country/territory	Census rounds							
	1950	1960	1970	1980	1990	2000	2010	2020
Latin America								
Argentina	1947	1960	1970	1980	1991	2001	2010	
Bolivia (Plurinational State of)	1950		1976		1992	2001	2012	
Brazil	1950	1960	1970	1980	1991	2000	2010	
Chile	1952	1960	1970	1982	1992	2002	2012	2017
Colombia	1951	1964	1973		1985, 1993		2005	2018
Costa Rica	1950	1963	1973	1984		2000	2011	
Cuba	1953		1970	1981		2002	2012	
Dominican Republic	1950	1960	1970	1981	1993	2002	2010	
Ecuador	1950	1962	1974	1982	1990	2001	2010	
El Salvador	1950	1961	1971		1992		2007	
Guatemala	1950	1964	1973	1981	1994	2002		2018
Haiti	1950		1971	1982		2003		
Honduras	1950	1961	1974		1988	2001	2013	
Mexico	1950	1960	1970	1980	1990	2000	2010	2020
Nicaragua	1950	1963	1971			1995	2005	
Panama	1950	1960	1970	1980	1990	2000	2010	
Paraguay	1950	1962	1972	1982	1992	2002	2012	
Peru		1961	1972	1981	1993		2007	2017
Uruguay		1963		1975	1985	1996	2011	
Venezuela (Bolivarian Republic of)	1950	1961	1971	1981	1990	2001	2011	
The Caribbean								
Antigua and Barbuda	1946	1960	1970		1991	2001	2011	
Aruba		1960	1972	1981	1991	2000	2010	2020
Bahamas	1953	1963	1970	1980	1990	2000	2010	
Barbados	1946	1960	1970	1980	1990	2000	2010	
Belize	1946	1960	1970	1980	1991	2000	2010	
Curaçao		1960	1972	1981	1992	2001	2011	
French Guiana	1954	1961	1974	1982	1990	1999	2008	2016
Grenada	1946	1960	1970	1981	1991	2001	2011	
Guadeloupe		1961, 1967	1974	1982	1990	1999	2006	2015
Guyana	1946	1960	1970	1980	1991	2002	2012	
Jamaica		1960	1970	1982	1991	2001	2011	
Martinique	1954	1961, 1967	1974	1982	1990	1999	2006	2015
Puerto Rico	1950	1960	1970	1980	1990		2005, 2010	
Saint Lucia	1946	1960	1970	1980	1991	2001	2010	
Saint Vincent and the Grenadines	1945	1960	1970	1980	1991	2001	2012	
Suriname	1950	1964	1972	1980		2003	2012	
Trinidad and Tobago	1946	1960	1970	1980	1990	2000	2011	
United States Virgin Islands	1950	1960	1970	1980	1990	2000	2010	

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of “Censos de población y vivienda: calendario desde la ronda de 1950”, n/d [online] <https://www.cepal.org/es/temas/censos-poblacion-vivienda/censos-poblacion-vivienda-calendario-la-ronda-1950> and United Nations Population Division (UNPD), Population Data Catalog and Data Archive Web [online database] <https://population.un.org/DataArchiveWeb/index.html>.

A. The COVID-19 pandemic and the status of statistical operations

In view of the challenges the pandemic poses for census and NSO operations, and in order to assess the impact of the COVID-19 crisis and identify technical and financial support needs, the World Bank and the United Nations Statistics Division have designed and conducted, in coordination with the United Nations regional commissions,⁷ an online global survey of NSOs. The survey, to which 120 countries responded, including 18 in Latin America and the Caribbean, consisted of three rounds: May, July and October 2020.

Box 1 summarizes the key results of the three rounds of the survey and how the global situation of NSOs evolved as the pandemic unfolded. A core issue analysed by the survey, and one which had a direct impact on censuses, was whether NSOs were subject to partial or full closures. The survey results show that, among the respondent countries, closures initially affected Latin American and Caribbean countries to a greater extent, as 35% of NSOs in the region were closed to all staff in May 2020, compared to 15% globally. The July survey round showed that many offices had reopened, with just 3% still closed worldwide and 13% in the region. Lastly, the October survey found that the situation in Latin America and the Caribbean was similar to the world average, with three quarters of offices open.

Box 1.1

Key results of the online global survey of national statistical offices, conducted in three rounds: May, July and October 2020

Phase 1: survey conducted in May 2020

The first round of the survey was conducted in May 2020 and focused on how the COVID-19 pandemic had affected the general functioning of NSOs.

- The COVID-19 pandemic was exacerbating global data inequalities. Statistical agencies in countries with the least resources faced the greatest challenges. The pandemic had impacted their operations: 65% of NSO headquarters were partially or fully closed, 90% had staff working from home, and 96% had stopped face-to-face data collection.
- Statistical operations had been hardest hit in low- and lower middle-income countries. 90% of NSOs in low- and lower middle-income countries were struggling to meet international reporting requirements, as opposed to one in two NSOs in high-income countries.
- Over 60% of NSOs indicated they needed additional external support.
- NSOs were adapting and responding to the new data needs and demands of the COVID-19 pandemic and were using alternative methods, primarily telephone surveys, administrative data and online surveys.
- The pandemic had highlighted the importance of digital data, while opening up new possibilities to strengthen and modernize core data collection programmes as the backbone of national data systems.

Phase 2: survey conducted in July 2020

The second round of the survey looked at how restrictions and disruptions had receded or become more widespread over time, and at national and international coordination in responding to data challenges posed by the pandemic.

- Since the survey in May, most NSOs had gradually moved towards office reopening and returning to face-to-face data collection, but working from home had become the new normal for many. New protocols were needed to operate more efficiently under that new environment. Some of the best practices and lessons learned needed to be scaled up.
- Remote work, training, data collection, and data storage were vital for NSOs to operate during the pandemic but many, particularly in low- and middle-income countries, were constrained by

inadequate information and communications technology (ICT) equipment and infrastructure. That called for more decisive investments in digital technology.

- Short-term statistical production, which relied heavily on traditional face-to-face methods, continued to be affected, with low- and middle-income countries impacted the most. Reliance on alternative data sources required smart investments to build the right spectrum of skill sets amongst NSO staff and NSS data producers.

Phase 3: survey conducted in October 2020

The third round of the survey focused on how NSOs had adapted to the new reality by implementing new surveys, developing new protocols for face-to-face data collection, and by building new partnerships.

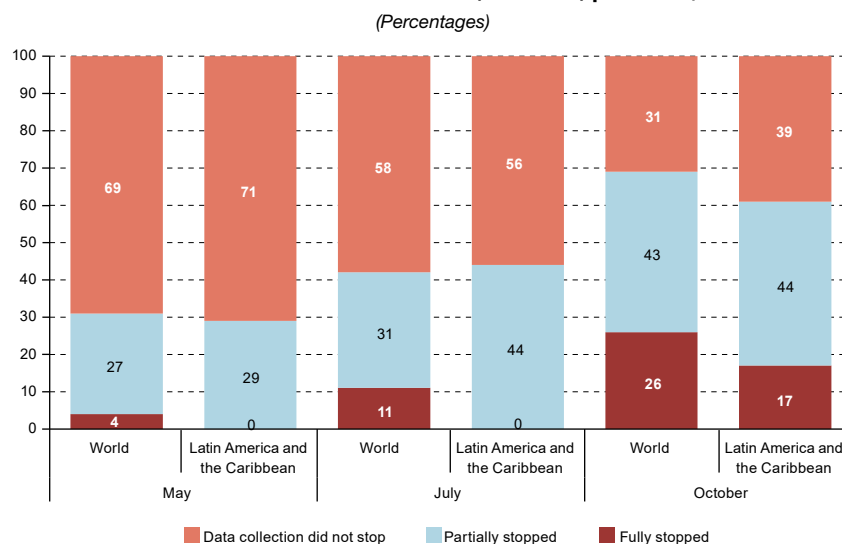
- Most NSOs had at least partially reopened since the initial closure in March-April 2020. Only 2% of NSOs were still closed to all staff.
- Globally, about a quarter of NSOs had no restrictions on face-to-face data collection, but there were large regional differences.
- Before the pandemic hit, 73% of NSOs had a population and housing census planned in 2020 or 2021. In the low and lower-middle income group, 68% percent of NSOs that were planning a census had to postpone it.
- Half of NSOs had developed new written fieldwork protocols for face-to-face interviews, while most of the remaining NSOs considered it would be useful to have such guidelines for their survey operations.
- NSOs remained heavily involved in tracking the spread and the impact of the COVID-19 pandemic.
- NSOs were engaging in new partnerships to bridge the data gaps created by the pandemic. The main challenge in establishing new partnerships with public or private sector partners had been formalizing the institutional collaborative arrangements.
- Many NSOs had taken on a data stewardship role, coordinating with government or national agencies, especially on data quality and data sharing agreements.
- The use of geospatial information and technologies had not been mainstreamed in COVID-19-related data collection in most NSOs, with the majority of NSOs in low- and lower-middle countries expressing a clear need to build analytical capacity and infrastructure in this area.

Source: United Nations/World Bank, "Survey of National Statistical Offices during COVID-19", 2020, 16 December [online] <https://covid-19-response.unstats.un.org/posts/survey-of-national-statistical-offices-during-covid-19/>.

⁷ Economic Commission for Latin America and the Caribbean (ECLAC), Economic Commission for Europe (ECE), Economic Commission for Africa (ECA), Economic and Social Commission for Asia and the Pacific (ESCAP), and Economic and Social Commission for Western Asia (ESCWA).

Given the almost complete lack of activity because of NSO closures, field operations were suspended either partially or fully, including both surveys and pre-census work, since face-to-face interviews entailed the greatest risk of infection. In May 2020, just 4% of countries worldwide were still holding all face-to-face interviews, 27% had suspended part of such data collection and 69% had stopped it completely. In Latin America and the Caribbean, around 30% of countries had suspended some face-to-face interviews and just over 70% had suspended them completely. Although some progress has been observed in this regard, in October 2020, 31% of NSOs worldwide had still completely suspended collection of field data through face-to-face interviews and in Latin America and the Caribbean the figure was 39% (see figure I.1).

Figure I.1
World and Latin America and the Caribbean: suspension of field data collection through face-to-face interviews because of the coronavirus disease (COVID-19) pandemic, 2020



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of United Nations/World Bank, “Survey of National Statistical Offices during COVID-19”, 16 December, 2020 [online] <https://covid-19-response.unstatshub.org/posts/survey-of-national-statistical-offices-during-covid-19/>.

Given the uncertainty that still prevailed in July 2020 among the authorities and technical entities responsible for conducting censuses and surveys (including population and housing censuses), and in view of the experience acquired in the response to the pandemic in the year to date, research was performed into the perception of the management staff and specialists of each of those institutions as to when they expected to resume face-to-face interviews in full. Of the 76 countries in the world that were surveyed, 53% did not commit to any specific period of postponement, and the percentage was similar among the 14 Latin American and Caribbean countries (50%). The most optimistic view of “within one month” was given by 12% of all respondent countries worldwide and 14% by of those in Latin America and the Caribbean, while “within three months” was given by 22% and 14%, respectively.

The great challenge that the countries faced because of COVID-19 —regardless of their level of development or social organization— made it necessary to speed up technological and organizational changes in the entities responsible for directing, designing and running national and territorial information systems, and of course, as a priority, in population and housing censuses, as pillars of such systems.

During the third round of the global survey, in October 2020, special emphasis was placed on the impact of the COVID-19 crisis on the population and the housing censuses that each of the surveyed countries was planning or conducting. Almost three quarters of NSOs that responded to the survey (90 countries) were planning on conducting a population and housing census in 2020 or 2021 prior to the outbreak of the pandemic. As face-to-face data collection challenges persisted, 40% stated they had to postpone data collection operations (United Nations/World Bank, 2020, p. 5).

Fieldwork is essential in all census activities, especially in countries with moderate or low levels of development, where online interviews are still quite limited. Only 17% of countries in Latin America and the Caribbean had managed to resume face-to-face interviews by the start of the last quarter of 2020, compared to a global percentage of 26%. In the region, 67% of countries still find it difficult to foresee when they will be able to resume face-to-face interviews, compared to 57% of countries in the world.

Regarding actual or planned use of personal protection equipment and measures to progress with censuses, in the NSOs of Latin America and the Caribbean, use of facemasks and hand sanitizer was equally widespread (77%), while globally, 68% of countries provided facemasks and 65% provided disinfectant. The third most frequent measure in the 125 offices surveyed worldwide was disinfectant wipes and aerosols (31%), while in the 17 countries of Latin America and the Caribbean, the third most reported measure was use of face shields (47%).

The preparatory stages of the population and housing censuses were also more severely affected in Latin America and the Caribbean. Of the countries of the world that were in the pre-census stage in 2020 (39) that had to postpone censuses as a result of COVID-19, slightly more than half were affected in terms of pilot censuses and staff training (51%), and almost 4 out of 10 (39%) postponed mapping and procurement of supplies through tenders. In the countries of Latin America and the Caribbean, nearly 7 out of 10 (67%) had to postpone mapping, pilot census, staff training and procurement of supplies. One third of countries postponed advertising and hiring of consultants and advisors, with no major differences between Latin America and the Caribbean and the rest of the world.

In the third round, questions were again asked about census timetables. Regarding the planning or conduct of population and housing census that some countries had been undertaking in or scheduling for 2020 and 2021, of the 125 countries in the world, 14% expected those activities to take place during 2020, almost 30% expected them to be carried out in 2021, and 15% of those planned for 2020 had been postponed to 2021. In Latin America and the Caribbean, of 18 respondent countries —apart from Mexico, which collected census data in 2020, as initially planned— three that had planned to collect census data in 2020 postponed collection to 2021, two that had it scheduled it for 2021 reported that they would collect data that year as planned, three others had postponed collection indefinitely and nine did not plan to collect data in 2020 or 2021. Lastly, as will be seen throughout this document, in 2021, 1 census was begun in Latin America and 2 in the Caribbean, while in 9 countries in Latin America and 14 in the Caribbean censuses were scheduled for 2022, and in 4 countries in Latin America and 1 in the Caribbean censuses were postponed to 2023.

Another situation that, owing to COVID-19, had some impact on census activity was reallocation of initially allocated financial resources, which went to other governmental activities rather than censuses. This type of measure affected one third of the countries in Latin America and the Caribbean and 16% of all countries in the world. Three out of every ten countries in the world and in Latin America and the Caribbean have decided to change approaches and methods for data collection in population and housing censuses, or to adopt new approaches.

B. The status of censuses scheduled for 2020 and 2021

In the pre-pandemic situation, 6 countries in Latin America and the Caribbean had planned to conduct a population and housing census in 2020 and 10 had planned one for 2021. After the pandemic was announced, the Latin American and Caribbean Demographic Centre (CELADE)-Population Division of ECLAC, in coordination with the Knowledge Transfer Network (KTN) of the Statistical Conference of the Americas of the Economic Commission for Latin America and the Caribbean (ECLAC), the Statistics Division of ECLAC and the National Institute of Statistics (INE) of Chile —as the coordinating country of the census group— organized a series of online workshops with the NSOs of the region. These workshops focused on analysing and sharing measures adopted in population and housing censuses in response to the effects of the health crisis, because several countries in the region were preparing their population censuses. Mexico, for example, was in the process of collecting data and other countries were in the map updating stage or were close to carrying out field work. Four meetings were held. The first three concentrated on actions being taken by NSOs and census takers to conduct census work despite shifting schedules and to attempt to safeguard financial resources

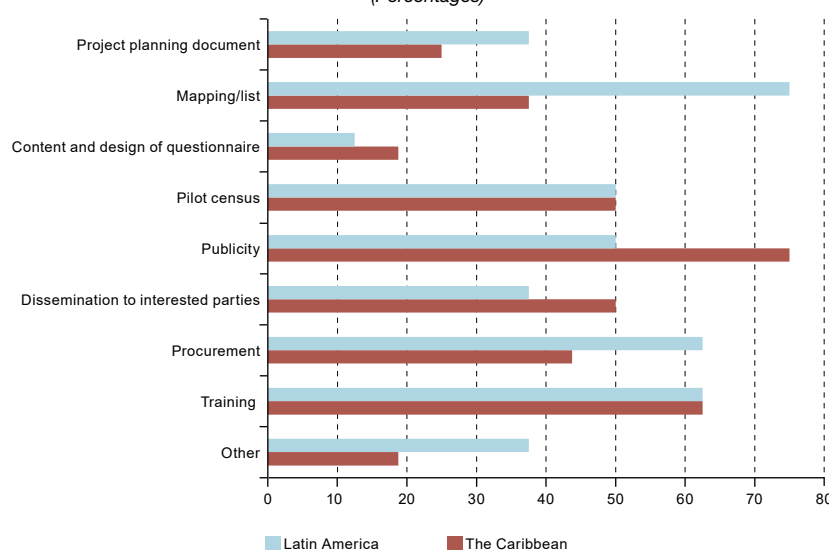
with respect to new requirements or budget cuts. The last meeting revolved around the new challenges posed by the pandemic in terms of participatory activities, data collection and formulation of special protocols for enumeration in areas of indigenous peoples and traditional communities.

In addition to the three rounds of the survey on the status of NSOs during the pandemic, the Statistics Division of the United Nations, responsible for the secretariat of the 2020 World Population and Housing Census Programme, surveyed countries that had originally scheduled a census for 2020 or 2021 to obtain information on how they were being affected by COVID-19 (United Nations, 2020). From the first round of this survey, conducted in March and April 2020, information is available for seven countries in the region (four in Latin America and three in the Caribbean) (see annex table A1.1). For the second round, carried out in December 2020 and January 2021, information is available for 28 countries in Latin America and the Caribbean (18 from the Caribbean and 10 from Latin America), of which 17 had a census scheduled for 2020, 8 had a census scheduled for 2021 and 3 did not indicate the planned census year (United Nations, 2021b).

Of the countries with a census scheduled for 2020 or 2021, 10 were in Latin America and 8 in the Caribbean. Aruba, Mexico, Puerto Rico⁸ and the United States Virgin Islands⁹ went ahead with their schedules for 2020, albeit with some activities postponed within the same year, and the other countries had to change census years. Table A1.3 in the annex shows that eight censuses scheduled for 2020 were postponed to 2021, two were moved to 2022 and years were not reported for a further two. Of eight censuses planned for 2021, three had been kept in the same year, four were being rescheduled for 2022 and the new year was not indicated for the remaining one.

In terms of the most affected preparatory activities, the task that most countries in the region had to cancel or postpone was mapping in Latin America and publicity in the Caribbean. Training was postponed or cancelled in more than 60% of the countries in the region, followed by pilot censuses, which were postponed or cancelled in 50% (see figure I.2 and annex table A1.2).

Figure I.2
Latin America and the Caribbean: preparatory activities for population and housing censuses scheduled for 2020 and 2021 that were cancelled or postponed because of the coronavirus disease (COVID-19) pandemic
(Percentages)



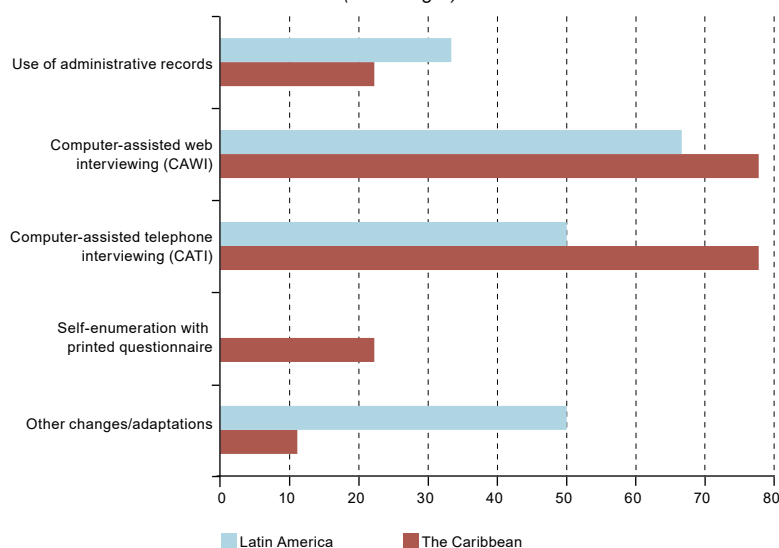
Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of United Nations/World Bank, "Survey of National Statistical Offices during COVID-19", 16 December, 2020 [online] <https://covid-19-response.unstats.org/posts/survey-of-national-statistical-offices-during-covid-19/>.

⁸ For the Commonwealth of Puerto Rico, the initial schedule ran from 15 March to 17 April 2020, and the revised schedule ran through to 22 May 2020.

⁹ In response to the COVID-19 outbreak, the United States Bureau of the Census adjusted its 2020 census operations. The collection period for the United States Virgin Islands was 3 February to 30 June 2020, which was moved to 3 February to 15 October 2020. Online self-surveys, telephone surveys, and postal surveys continued throughout the data collection process.

As mentioned above, one of the most widespread consequences of the pandemic in terms of census operations is the difficulty of conducting face-to-face interviews, because of the need to protect the health of census takers and of interviewed households. It was found that most of the countries suspended this form of data collection and, when asked what methods they had adopted as alternatives, the Caribbean countries reported Internet and telephone data collection (7 out of 9 in both cases) and to a lesser extent the use of administrative data and self-enumeration with printed questionnaires. In Latin America there was no mention of paper self-enumeration (sent by post), but about half of answering countries reported using computer-assisted web interviewing (CAWI) and computer-assisted telephone interviewing (CATI) methods, and to a lesser extent, they planned to draw on administrative records. Mexico explained that CAWI and CATI methodologies had been used since preparation of the 2020 census, but self-enumeration by post was rolled out during the lockdowns because of COVID-19 (see figure I.3 and annex table A1.4).

Figure I.3
Latin America and the Caribbean: approaches or methods for population and housing censuses scheduled for 2020 and 2021 that were changed or adapted because of the coronavirus disease (COVID-19) pandemic
 (Percentages)

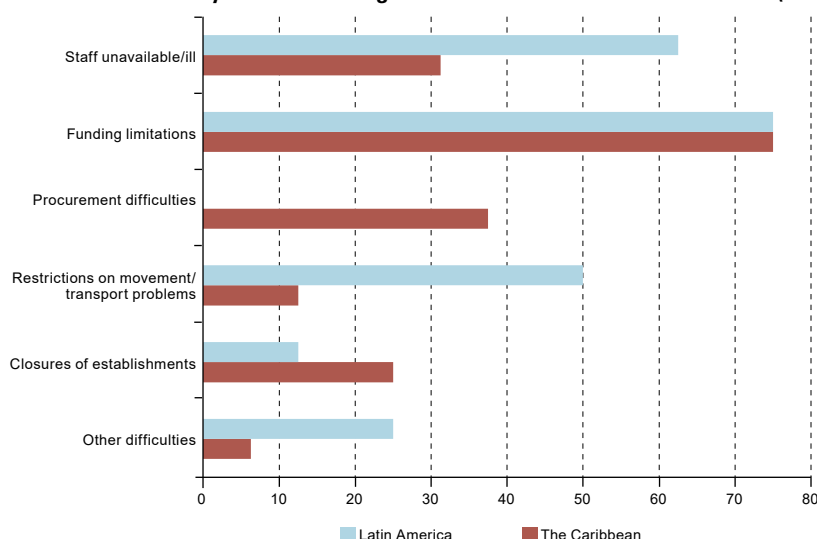


Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of United Nations/World Bank, “Survey of National Statistical Offices during COVID-19”, 16 December, 2020 [online] <https://covid-19-response.unstatshub.org/posts/survey-of-national-statistical-offices-during-covid-19/>.

The survey asked countries to report up to three key difficulties they encountered in conducting censuses because of the COVID-19 pandemic. Three out of four countries in the region agree that financing constraints are the main problem. There are differences with regard to the other problems: while in Latin America the countries reported that they are mainly affected by staff being unavailable or sick (63%) and by movement restrictions and transport problems (50%), in the Caribbean countries mentioned procurement difficulties (38%) and, to a lesser extent, staff availability problems (31%) (see figure I.4 and annex table A1.5).

One of the difficulties mentioned was that it was not possible to train enumerators as initially planned and that training had to be performed online. Other difficulties included a lack of in-house staff with experience in CAWI, the added expenses of personal protection equipment (PPE) for field workers and in some cases for household members, and coverage problems with public electricity or Internet services. Mexico identified certain difficulties in completing the census, such as a rise in non-responses in the last week of March 2020 and the need to reschedule the subsequent stages, in an attempt to limit the delay in publication of the results, and to adapt data processing to telework while guaranteeing confidentiality.

Figure I.4
Latin America and the Caribbean: key census challenges because of the coronavirus disease (COVID-19) pandemic



Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of United Nations/World Bank, “Survey of National Statistical Offices during COVID-19”, 16 December, 2020 [online] <https://covid-19-response.unstats.un.org/posts/survey-of-national-statistical-offices-during-covid-19/>.

Lastly, countries were asked to describe any other measures or actions they planned to take to minimize the harmful effects of the COVID-19 pandemic. The most frequently reported measures relate to the biosecurity of field staff and households, such as providing PPE to field staff (in 16 of the 21 countries that responded to this open-ended question), running an online training service for field staff (9 countries), formulating protocols to mitigate COVID-19 (7 countries), minimizing staff contact with interviewed households (5 countries) and, for the same reason, shortening the census questionnaire (1 country) and using tablets (1 country), employing methods that avoid staff contact with interviewees such as collecting data online or by telephone (3 countries), establishing help centres and call centres (1 country), increasing the number of field staff and implementing other mechanisms to support households in completing the questionnaire online (1 country).

Additional measures included strengthening publicity to keep the population informed or making adjustments to adapt messages to the COVID-19 situation (11 countries), requesting additional budget allocations or borrowing to meet cost increases (such as for PPE or larger field staff) (7 countries), and rescheduling activities (2 countries).

C. Potential impacts of the COVID-19 pandemic on the conduct of population and housing censuses and the quality of their data

The Statistics Division of the United Nations organized two online expert meetings, the first in February¹⁰ and the second in November¹¹ 2021. Each of the meetings, which focused on the impact of the COVID-19 pandemic on the conduct of population and housing censuses and data quality, were attended by more than 100 experts from over 20 national statistical offices, as well as staff from regional and international organizations. The first meeting focused on the impact of the COVID-19 pandemic, the design and conduct of census operations, and the challenges of producing timely, accurate, and reliable small area statistics during the pandemic. The data quality problems caused by the effects of the pandemic on census statistics, health protocols and the comparability of census data over time were also addressed (United Nations, 2021a). The main conclusions of the meeting included postponement of census timetables, extension of enumeration periods, modification of questionnaires and adaptation of procedures (for example, the implementation different mechanisms to reduce direct contact with respondents). The main changes were introducing a combination of data collection through web-based self-enumeration (electronic census), computer-assisted telephone interviewing, and self-enumeration through printed forms (drop-off and pick-up), to replace face-to-face interviews.

¹⁰ See [online] <https://unstats.un.org/unsd/demographic-social/meetings/2021/egm-covid19-census.cshtml>.

¹¹ See [online] <https://unstats.un.org/unsd/demographic-social/meetings/2021/egm-covid19-census2/>.

Most countries that participated in the first meeting said that these exercises resulted in higher costs, owing to the change from planned activities and collection methods to others that involved less interaction with respondents, requiring meticulous and extended testing, which was not included in original census budgets. These conclusions were reaffirmed at the second meeting, in November, when the countries confirmed that they had made progress in implementing the changes to census operations despite the epidemiological situation and had even been able to conduct population and housing censuses during the pandemic. However, it was also concluded that not all countries were in the same position to implement the changes, resulting in repeated postponements of censuses. In addition, countries reported that cost increases were larger than originally anticipated, because of the changes in response to the pandemic, including longer fieldwork time, postponements, testing, systems integration, the need for PPE for field personnel, publicity campaigns to inform the public and educate field personnel on new collection methods, and the cost of telecommunications for telephone interviews and data for mobile devices.

A recommendation was made that before adjusting the design of collection or capture methods, sufficient time be allowed to test new processes, applications and systems. Testing the fitness for purpose of data collection system integration is especially important in addressing the operational challenges of multimodal data collection management. Consideration should also be given to overcoming the difficulties of duplicated entries when multiple modes of collection are used.

Conducting field enumerations under the pressure of the COVID-19 pandemic has raised concerns about data quality. Changes in the design of field operations to reduce face-to-face interviews and extend the enumeration period could erode data quality. Respondents may have difficulty remembering where they lived and how many people resided at a given address on the census reference date. Conducting fieldwork over an extended period of time may result in ambiguous answers regarding inclusion of household members on the census reference date, given that household size may change during enumeration.

Similarly, it was noted that the concept of “usual place of residence” may be less important or more ambiguous, given the uncertainty during the COVID-19 pandemic, for persons who have changed their place of residence several times, students, who generally live away from family homes but stayed with their families during the pandemic, or workers who had to move from their usual place of residence to their family home because of COVID-19 closures. In that regard, it is recommended that countries that have not yet conducted their censuses consider providing both enumerators and respondents with additional explanations and guidance to clarify the concept of usual place of residence.

The experts also noted that collecting data on the exact dates of certain events in a reference period, such as deaths, births, and migrations, may have advantages in terms of analysing changes in the levels and patterns of such events during the pandemic, particularly in countries that do not have reliable administrative records. For example, if a questionnaire includes a question on deaths in the household, information on the date of deaths and the age and sex of the deceased should be collected, and a reference period longer than 12 months could be used in the round.

It was also mentioned that shortening the questionnaire could result in insufficient data to calculate several indicators, such as poverty measures (including the multidimensional poverty index, which is necessary for monitoring the 2030 Agenda for Sustainable Development). Participants acknowledged that censuses would play a key role in clarifying the impact of the COVID-19 pandemic on society. The pandemic, as a global event, calls for special analysis of overall costs and of lives and years lost, and these census statistics will be invaluable in that regard.

The growing importance of adequate and complete quality assessments of census field work and data processing, in terms of coverage and content error, was also noted. This requires appropriate methodologies and independent sources, such as post-enumeration surveys, demographic methods, administrative sources and quality indicators on areas such as coverage error, non-response rates and imputation at the variables level. It was suggested that the results of the quality assessments and their indicators be made publicly available to inform users about data quality in a transparent, complete and comprehensive manner so that they were aware of the reliability and quality of census data (in terms of accuracy, timeliness and relevance) to uphold trust in official statistics.

In keeping with this concern for the quality of census data and a rapid transition to data collection methods that dispense with face-to-face interviews or combine different forms of data collection—which

Latin American countries have shown special interest in implementing to address the problems of the pandemic—online workshops were organized by CELADE-Population Division of ECLAC and the National Institute of Statistics (INE) of Uruguay, with the support of the Regional Office for Latin America and the Caribbean of the United Nations Population Fund. The workshops focused on several issues, including exchanging experiences relating to the methodological and conceptual problems of incorporating web-based self-enumeration questionnaires (electronic censuses) as an additional capture method in census operations, identifying quality problems, determining if questions or response categories were changed or deleted, and whether or not specific omission rates were presented for methods and in which cases this survey strategy was applied. The experts agreed a great deal of testing with users was needed of the technological infrastructure capacity of national statistical institutes to support the processes, and recognized that for the region it was still a very complementary method, focused on reducing omission in certain sectors of society, and that it still suffered from problems relating to omission of persons and second homes, as well as high rates of unfinished forms. Another issue that was mentioned was the need for an overhaul of webforms to make them sufficiently attractive and self-explanatory, and strong communication campaigns explaining data collection methods and reference periods for censuses.

One session was also devoted to discussion of the inclusion and subsequent use of a question on individuals' possession of identification and its number. Since it was acknowledged that including a question on identification numbers could cause problems in some countries, its placement in the questionnaire and level of rejection needs to be tested. However, its great potential to improve the quality of some variables or response categories with external information was also openly recognized, for instance in Colombia's 2018 census and Peru's 2017 census, so it could be of great help to improve the quality of censuses during the pandemic. It was considered, however, that decisions on inclusion and use of such a question should be accompanied by plans for construction of a long-term national population registries, to begin to move towards register-based censuses, and that it was essential for there to be a statistical law that allowed the public to be certain that the use would be solely for statistical purposes.

As mentioned above, as part of the tasks outlined in the biannual plan of the working group on censuses of the Statistical Conference of the Americas of ECLAC, a guidance document entitled "Lineamientos generales para la captura de datos censales. Revisión de métodos con miras a la ronda de censos 2020" was prepared by KTN and CELADE-Population Division of ECLAC as technical secretariat, with the systematic support of the United Nations Population Fund (UNFPA) and the coordination of the National Institute of Statistics of Chile, as well as the special collaboration of the technical teams of the NSOs of Brazil, Colombia, Costa Rica, Ecuador, Mexico and Bolivarian Republic of Venezuela. The document reviews data capture methods and regional experiences, with a view to strengthening the 2020 census round. The document is intended as a practical and general guide to help guide decision-making regarding the method of capture to be used in future censuses in the region, taking into account both the breadth and complexity of the preparation and execution of population and housing measurements, as well as the added complications of the COVID-19 pandemic. Moreover, as the 2020 census round has already begun and given the growing interest of the countries in the region in moving towards the use of mobile data capture devices and the Internet in data collection processes, this document has been published at an opportune time, summarizing some interesting regional experiences and aiming to contribute to improving the quality of census data in the region by offering guidance regarding the advantages and disadvantages of each capture method. The report also recommends examining the organizational and institutional context faced by each NSO when deciding to move towards the use of more technologies for data capture. In addition, it reviews the complexity of some processes that require new skills and competencies in technical and professional teams as more technologies are added to data capture, including their great potential to improve the quality and timeliness of census results.

Chapter II analyses the specific situation of each country's census with respect to the 2020 round.

II. The 2020 round of censuses in Latin American countries

Colombia, Guatemala and Peru conducted their censuses for the 2020 round before 2020, while in Mexico the census was being held in that year. In most of the other countries, the various preparatory and pre-census stages were being implemented in 2020, with the census itself scheduled for between 2020 and 2022. However, activities had to be rescheduled and methodologies adjusted, for the reasons described below. The countries for which there is least information on the next population and housing census are Haiti and Nicaragua. Haiti's census had been postponed before the onset of the pandemic; and, naturally, the complications arising from the latter, compounded by the social upheaval caused by the assassination of the president and the earthquake of August 2021, will require a number of decisions to be revisited. Accordingly, it is currently unknown when the census will be conducted or what its basic characteristics will be. In the case of Nicaragua there has been no communication on the schedule envisaged for the next census.

A. Countries in which the census was conducted prior to the COVID-19 pandemic

1. Colombia

Colombia's National Population and Housing Census was scheduled for 2015, but was eventually conducted in 2018. This was a *de jure* census with an extended period of ten months (DANE, 2018), with three instruments being used to collect data: an electronic questionnaire (eCensus), mobile capture devices (MDCs) and a paper form. No pre-census or properly updated housing counts were available, which caused difficulties throughout the field operation. When consolidating the information from the three different databases obtained from the collection methods, inconsistencies were found owing both to omissions and to imputations that were not compatible between the databases. In addition, the census reference moment could not be clearly defined, which prevented implementation of the recommendation to unify the time within a minimum interval.¹²

¹² In a census, the demographic and socioeconomic attributes of the individuals who make up a population must be sufficiently comparable, not only because of the dynamics of the behaviour of these variables in the short term, but also because they change more rapidly and intensely at the territorial level. For example, when there are migratory movements, they affect the habitual residence and spatial distribution of the population. This entails the risk of under- or over-enumeration. When making demographic calculations, it is necessary to have dates of occurrence; and, in censuses, there must be a census moment as a reference point.

One of the innovations made in this census was the first-time inclusion of a question related to the type of official identification document and its number, in order to link the content of the variables with the administrative records, which also hold individual information. This aimed to make it possible, in the future, to build a basic statistical register of population, with a view to enhancing longitudinal and life-cycle analyses of individuals for public policy and programme planning purposes (DANE, 2021c).

In terms of the coverage and quality of the census results, it was found that the population omission rate ranged between 8.5% and 11%, depending on the method used. The first of these figures was obtained through the dual estimation method using the National Quality of Life Survey (ENCV-2018); and the second was obtained from the population projections of the Latin American and Caribbean Demographic Centre (CELADE)-Population Division of ECLAC, 2019 revision (CNE, 2019). Although this omission rate is considered high, the commission of national experts considers that it does not invalidate the use of the census results for population analysis and as input for public policies, academic studies and the upcoming tasks facing the National Administrative Department of Statistics (DANE) in terms of estimates and projections (CNE, 2019, p. 85).

Lastly, according to the latest 2018 census results released by DANE, Colombia's population is provisionally estimated at 48,258,494 people; and there are 13,480,729 dwellings inhabited by private households and 14,243,223 private households altogether (DANE, 2018).

2. Guatemala

According to the report on the results of the twelfth National Population Census and seventh Housing Census of Guatemala, which was held in 2018, with crucial support provided by the United Nations Population Fund (UNFPA) and ongoing assistance from CELADE, the country was able to form a baseline for constructing many of the indicators required by the Sustainable Development Goals of the 2030 Agenda (INE of Guatemala, 2019a). This was a *de jure* census in which the survey stage lasted from 23 July to 16 August 2018, with the census recovery period running from 17 August to 5 September of the same year.

The programming and execution of the census involved wide-ranging participation by the different institutions and sectors of society. This participation operated through census commissions, technical roundtables, workshops and thematic roundtables, which were organized at both the national and the territorial levels. Together with support from more than 35 international missions, this made it possible not only to strengthen the National Statistics Institute (INE), but also to underpin the quality and transparency of this very important project. It had been 16 years since Guatemala last conducted a population and housing census (INE of Guatemala, 2019a, p. 9).

According to the results obtained in the census, the Guatemalan population consisted of 14,901,286 individuals, which represented an annual intercensal growth rate of 1.8% relative to the 2002 census. There were 3,275,931 households and, based on self-identification, Mayan people accounted for 41.7% of the total population (INE of Guatemala, 2019a, p. 25). According to the document titled *Memoria de Labores 2019* (INE of Guatemala, 2020), Guatemala had a population of 16,346,950 in 2018, which indicates a census omission rate of 9.7% (INE of Guatemala, 2019b).

3. Mexico

A *de jure* census was conducted in March 2020, for which the preparatory stages had begun in 2018. November 2019 saw completion of the pre-census stage, which included a pilot test and a cartographic update using mobile devices as the medium of data capture. On an exceptional basis, paper forms were used in remote locations. Insecurity owing to the high level of violence in the country was one of the greatest difficulties faced. Although the change of government in late 2018 resulted in budgetary adjustments, these did not prove very serious for the purposes of the census.

However, the health and physical distancing measures adopted when the pandemic broke out had an impact on the enumeration operation, which at that time was half complete. The situation became critical owing to the considerable increase in COVID-19 cases; and this made it necessary to reinforce personnel in order to complete this stage, which was done with the authorization of the Secretariat of Health of Mexico, but in strict compliance with the health measures. Nonetheless, it became necessary to postpone the verification stage and to consider the possibility of doing this via Internet. The coverage survey that had been scheduled for 27 April 2020 was cancelled definitively. Box II.1 provides an overview of the collection, verification and field coverage recovery stages.

Box II.1**Mexico: Population and Housing Census 2020****Census objectives**

Produce information on the size, structure and spatial distribution of the population, and on its main socioeconomic and cultural characteristics. Obtain housing counts and determine some of their characteristics. Observe demographic, economic and social trends.

Methodological characteristics

Cartographic updates were performed both before and during the data collection stage. The target populations were the dwellings and the habitual residents of the country. The appropriate respondents were the heads of the dwelling, or a person aged 18 years or older who was a resident of the dwelling and could provide data on its occupants. The questionnaire could be either digital or printed; and complementary methods could be used, such as self-enumeration via Internet and telephone-assisted interviewing. To obtain the interview, at least three visits were made to the dwellings, at different times or on different days. The survey period was 2–27 March 2020, and the reference moment was 15 March 2020.

A basic questionnaire was used for the exhaustive enumeration, consisting of 38 questions. An expanded questionnaire with 103 questions (38 from the basic questionnaire and 65 additional ones) was applied to nearly 4 million households. Locality, urban environment and social housing questionnaires were also used.

New topics

The following new topics were considered: water storage equipment; new goods and information and communications technology (ICT); municipality of residence five years ago; cause of migration; African descent; and degree of limitation or disability.

Technological innovations

The technological innovations deployed include the following: data collection using mobile devices; primary validations in the questionnaire; verification of activity status; use of digital cartography and registration of coordinates through the Global Positioning System (GPS); self-enumeration via Internet or assisted by telephone as complementary methods; and encrypted and coded information.

Main effects of the coronavirus disease (COVID-19) pandemic

- The enumeration was completed on schedule. In the final week there was an increase in non-response and isolated assaults on staff.
- The first week of verification was completed and the remaining two weeks were rescheduled (from June to August).
- The recovery of backlogs was cancelled and integrated into the second phase of verification.
- The post-enumeration survey was cancelled and targeted coverage sampling was conducted.
- Subsequent stages were postponed and the publication date was rescheduled.
- Of all the households identified as inhabited, 96% were interviewed.

There was fear among respondents owing to the possibility of contagion. Hygiene and healthy distancing measures were adopted: starting in mid-March, funds were distributed to the staff assigned to visit dwellings, to enable them to purchase masks, antibacterial gel or hand soap. There was a greater turnover of staff: in the last few days of the enumeration some were absent, staff belonging to the risk group were withdrawn, and work teams were isolated as a preventive measure.

The COVID-19 pandemic affected both the data collection operation and the desk work of the 2020 census. Different stages of the census had to be rescheduled and suspended; and the National Institute of Statistics and Geography (INEGI) was forced to adapt to situations arising each day. The safety of the staff and of the population at large was prioritized at all times. Although self-enumeration was encouraged strongly, the response was not as expected.

Results

The census population consisted of 126,014,024 individuals, of whom 51.2% were women and 48.8% were men. This included an estimated 6,337,751 persons (5.3% of the population) corresponding to 1,588,422 dwellings without occupant information and omitted minors. The intercensal growth rate was 1.2% and coverage was 96% of the population.

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of “Protocolos para enumeración en censos y encuestas para pueblos indígenas y comunidades tradicionales en contexto de Covid-19”, 2020, 24 November [online] <https://www.cepal.org/es/eventos/protocolos-enumeracion-censos-encuestas-pueblos-indigenas-comunidades-tradicionales-contexto>; National Institute of Statistics and Geography (INEGI), “Presentación de los resultados del Cuestionario Ampliado del Censo de Población y Vivienda”, Mexican Demographic Society (SOMEDE), 2021 [online] <https://www.youtube.com/watch?v=ICHXhGcwKYM>; Institute of Statistics and Geography (INEGI), Censo de Población y Vivienda 2020, Síntesis metodológica y conceptual, 2021; Institute of Statistics and Geography (INEGI), “Seminario ‘Impactos de COVID-19 en la generación de información estadística y geográfica en México’”, Mexican Demographic Society (SOMEDE), 2021, 19 August [online] <https://www.youtube.com/watch?v=vO7qTK1oM3Y>.

In view of the experience gained in the 2020 census and the challenges envisaged for the 2030 round, administrative records need to be incorporated —as is expected to be done in other countries in the region, using the individual identification document as a link between the databases. Moreover, as part of international cooperation, advice and technological support is expected on the use of open data and adequate risk management in all census processes in the event of disasters of various kinds (ECLAC, 2020).

4. Peru

Through Supreme Decree No. 066-2015-PCM, the Government of Peru declared a priority national interest to carry out the following national censuses in 2017: the twelfth population census, the seventh housing census and the third census of indigenous communities (INEI, 2018a). It was the first time that a census of campesino communities had been held.

This was a de facto census that was conducted on 22 October 2017, when the population was “immobilized”, and the data from the urban zone was collected; the information from the rural area was collected between 23 October and 6 November. Two types of census questionnaires were prepared: one for population and housing, and another for Indigenous (originating and campesino communities). Three experimental censuses were conducted to fully evaluate the census process and the methodological procedures established to perform the census activities, and to verify the functioning of the computer applications used to undertake them (INEI, 2018b).

The questionnaire contained 13 questions on housing, 3 on household assets, 2 on household composition and 29 on individuals. One of the novelties was that the questionnaire captured personal identity document numbers (INEI, 2017a), which will make it possible to integrate these data with those contained in administrative records. Investigation of this variable makes it possible to provide information on the number of persons who are undocumented, with the aim of creating a regulatory framework to encourage documentation.

In the first stage of field coverage recovery, emphasis was placed on the omission that had been reported in the media and in social networks, which had received information on uncounted homes. To this end, recovery work routes were programmed by district. In the second stage, the omission of dwellings at the census section level was addressed, having been reported in the monitoring, control and follow-up system of the census operation. The post-census survey to evaluate the coverage and quality of the information collected in the 2017 national censuses consisted of three stages: housing coverage, population coverage and information quality (INEI, 2017a). Census personnel received face-to-face training, and cascade levels were reduced as far as possible. National trainers and a trainer’s guide were used to standardize the training provided and minimize distortions.

B. Countries scheduled to conduct the census survey between 2022 and 2023

1. Argentina

The census in Argentina was scheduled for 28 October 2020, and was to be a de facto census using a basic questionnaire in all households and an expanded form applied to a sample. Paper-based and scanner capture would be used, with teaching and student staff employed in each enumeration area to conduct face-to-face interviews. The preparatory stage began in 2016 with the planning and programming of the 2020 census round; in 2017 the *Archivo de Domiciles de la República Argentina* (ADRA) was designed and implemented, in which the count of buildings and dwellings practically constituted a pre-census. This served not only as an element for cartographic updating and determining workloads, but also as a sampling framework for applying the expanded form in localities of more than 50,000 inhabitants.¹³

On 18 March 2020, the National Institute of Statistics and Censuses of Argentina (INDEC) suspended the entire field operation owing to the COVID-19 pandemic. This situation seriously jeopardized continuation of the training processes and implementation of the census, because school and academic activities were suspended for an indefinite period. As the possibility of introducing methodological and operational changes had not been considered at the outset, but was only foreseen for the 2030 round, the uncertainty of the situation forced the census to be postponed until 2021. The experimental census that had been scheduled for late September 2020 was not rescheduled; and its execution was made dependent on how the pandemic evolved; the alternative of conducting online interviews was also considered. The change of government in late 2019 and the legislative elections scheduled for 2021 also had some influence on the budgetary adjustments and fulfilment of the timetable (ECLAC, 2020).

On 18 August 2021, the inaugural meeting of the National Census Operating Committee was held, in which the census was officially presented (INDEC, 2021a and 2021b). It was confirmed that there would be a move to the de jure census modality, using a single questionnaire containing 56 questions; that the national

¹³ For purposes of the 2020 census round, in May 2019 the National Institute of Statistics and Censuses of Argentina (INDEC) for the first time began rolling out the ADRA operation in urban areas of the country that had more than 2,000 inhabitants. In that operation, information was collected through mobile capture devices (MCDs) to provide inputs to the geographic database.

identity document (DNI) number would be requested; that online self-enumeration (eCenso) would be used; and that the platform developed by INDEC would be open for two months before census day, from 16 March until 18 May 2022. The census day, 18 May, will be a national holiday; the territorial sweep will be made with a visit to each dwelling; the code will be used to verify the information provided in the eCensus and the process of geolocating the dwelling will be carried out. If the information cannot be verified, the questionnaire will be applied on paper and then scanned. The census taker will also carry a mobile device for operational control. After this day, there will be seven more days of fieldwork to carry out the coverage recovery. Special operations will take account of rural areas, collective housing and homeless people. Administrative records will be used for complementary validation and consistency purposes. Wholly online training will be provided to more than 600,000 people throughout the census apparatus. INDEC is also working on the computer system for census control and management, and on the preparation of the statistical population register based on administrative records. This should be ready before the census in order to test it with the data collected in the field and create the baseline for future censuses.

There will be several innovations in the 2020 census round, such as data collection over an extended period, moving from a *de facto* to a *de jure* census and introducing self-enumeration by eCensus. However, an interview with INDEC management clarified that, on the day of the census, enumerators will carry enough paper questionnaires to survey the entire population, as was done in previous censuses. If it is found that the eCensus has worked and that a significant proportion of households have completed it, staff will have less to do in the field, allowing for more quality and coverage checks. This means that the innovation does not constitute a risk for the census. It is known that there have been many changes of residence owing to the pandemic; and, although by May 2022 the population will have stabilized further, it is important to support the habitual residence concept, so the National Registry of Persons (RENAPER) will be used.

2. Plurinational State of Bolivia

Based on Supreme Decree No. 4546 of 21 July 2021, the Plurinational State of Bolivia is preparing the next population and housing census as a national priority. The census will be held on 16 November 2022 in urban zones, and on 16–18 November in rural areas. The National Statistics Institute (INE) will be in charge from the preparatory stages through to results dissemination. Since this is a *de facto* census, the population will be “immobilized” on the day of enumeration, and international borders will be closed. The census agents will be mainly volunteer students in their final years of school education, along with teachers and some civil servants (INE of the Plurinational State of Bolivia, 2021).

The statistical cartography will be updated using mobile devices, supported by satellite imagery; and the first pilot test should be carried out between May and September 2021. In this pre-census stage the research tool will also be created, and the census questionnaire will be developed through evaluations or quantitative tests, such as conceptual design tests and pilot tests. The design of the questionnaire and the recognition of marks and characters will be tested through scanners, and the quality of the materials and equipment acquired will also be evaluated (INE of the Plurinational State of Bolivia, 2021, p. 13). The census ballot will be printed on paper and will contain the same questions as previous censuses (1992, 2001 and 2012), so as to be able to make comparisons, both over time and with other countries. A pilot census is planned, covering all the stages. It is important to insist on the need to guarantee optimal quality of the census by carrying out a complete cartographic update at least six months before enumeration. To this end, INE expects to improve its tools through georeferencing, which in turn will enable efficient allocation of census sectors and the updating of sampling frames for the various household surveys that multipurpose socioeconomic research requires on an ongoing basis.

In the post-census stage, a survey will be conducted to evaluate the experience of the census process and also to perform a demographic reconciliation by components.

3. Brazil

A *de jure* census will be conducted in Brazil with a three-month enumeration stage. This census was scheduled for 1 August 2020, but it was postponed by a year owing to the COVID-19 pandemic. However, budgetary constraints forced the current Brazilian government to postpone it once again. On 18 May 2021, the website of the Brazilian Institute of Geography and Statistics (IBGE) announced that, following a vote by the Federal

Supreme Court (STF), on Friday, 14 May of that year, the IBGE management had drawn up a plan to fulfil the court ruling that the demographic census would be conducted in 2022 (IBGE, 2021a).

The first case of COVID-19 was recorded in Brazil on 26 February 2020. Classes and non-essential services were suspended on 11 March; and a state of public calamity was declared a week later. The first death from the virus had been registered on March 17, coinciding with the announcement that the census would be postponed to 2021 (IBGE, 2021a).

According to the webinar held on 19 May 2021 (MERCOSUR/INDEC, 2021), IBGE proposed a census modernization strategy dating from before the pandemic. This combines administrative records and sample surveys that optimize the role of the census and use technologies that facilitate data collection and processing, increase operational efficiency and improve coverage rates. The pandemic posed the challenge of re-envisioning traditional methods of data collection, and of modifying and adapting work environments—for example, making it possible to work at home. The institute promoted use of the telephone to collect data for the COVID-19 National Household Sample Survey (PNAD) and the Continuous National Household Sample Survey (PNAD-Continua). This made it necessary to match the databases to obtain the telephone number of the households interviewed based on administrative records, and to adapt the data collection process to the physical distancing norms in force at the time. For the purposes of the census, the address register will be obtained by matching with administrative records, thereby improving territorial coverage. The data collection model is a mixture of the following modalities: computer-assisted personal interview (CAPI), computer-assisted telephone interview (CATI) and computer-assisted web interview (CAWI). These alternatives will be maintained for 2022. During data collection, technologies will be used to control coverage and improve supervision. These will make it possible to correct data collection in real time, which means monitoring the evolution and quality of the process, managing operational performance by level of disaggregation, analysing demographic indicators that are updated automatically from the data collected, and making comparisons with data from other surveys and previous demographic censuses. With support from UNFPA, a population estimate at the statistical grid and census sector level was also performed, which will help monitor the course of the census in all its phases. Information posted on the IBGE website indicates that a basic form containing 26 questions will be used, and an expanded form with 76 questions will be applied to a sample of roughly 10% of the population. Apart from the trialling of the questionnaires, there will be two pilot tests, an equipment and systems approval test, and an experimental census. In September 2021, a test was conducted on Paquetá Island to evaluate the applications and systems designed for the simultaneous implementation of the three data collection modalities. A post-census survey will be conducted to evaluate coverage and quality (IBGE, 2021b).

4. Chile

In 2012, Chile implemented a *de jure* census that involved three months of fieldwork. Its data displayed serious quality problems, for which reason it was declared unofficial. As a result, a new census was conducted in 2017—a *de facto* census undertaken on a single day, using a scanner-readable paper questionnaire with fewer questions. It was planned to follow-up this census with another one in 2022, in which all of the questions asked in traditional censuses would be included. According to statements made in the third videoconference on the impact of COVID-19 on population and housing censuses, which was held on 30 July 2020 with Chile, Cuba and Paraguay as presenters (RTC, 2020c), Chile's next population and housing census was expected to be carried out from April to June 2022. This would have been a *de jure* census using mobile capture devices (MCDs). However, it was later decided to postpone the census until 2023 owing to the pandemic, since the constitutional state of emergency that had been decreed for 90 days on 18 March 2020 was extended until September 2021.

As from 16 March 2020, teleworking was implemented among the census team, health safety measures were adopted, and a way was sought to conduct training wholly, in virtual mode. In addition, the team was affected by the budget cut, and the two pilot tests that had been scheduled for May and October 2020 were postponed and redefined (INE Chile, 2020a). In November 2020, INE posted intercultural participation sheets on its website and in citizen service centres, so that all indigenous and Afrodescendent people's organizations in Chile could register their thoughts on the census questionnaire (INE of Chile, 2020b). In 2021, the first field test was conducted in five boroughs (*comunas*) of Santiago, to assess understanding of the questionnaire and trial the new technologies to be incorporated into the data collection process (INE of Chile, 2021a). Between

November and December 2021, another pilot test was conducted in five regions (nine boroughs), incorporating two remote modalities that will complement face-to-face data collection: the eCensus platform, which is accessed with a QR code left at the dwelling, and a toll-free telephone line should the census taker be unable to apply the questionnaire in person (INE of Chile, 2021b). The experimental census is planned for the second half of 2022; and from May to September of the same year, it is planned to update the cartography without a traditional pre-census, with partial pre-enumeration and intensive use of administrative records. As in all countries, the processes in Chile have been adjusted to take account of the lessons learned and demands of the pandemic: for example, training will be provided combining both face-to-face and online methodologies. The census is planned for completion in 12 weeks, using MCD as the main collection method, in addition to the eCensus platform, the CATI modality and paper as complementary media.

5. Costa Rica

A three-week *de jure* census will be conducted using MCD and census takers will be hired. The census was originally to have been held in May 2021, but was rescheduled for 2022. The advantages offered by the development of digital technology and significant progress in communications made it possible to move ahead with much of the census preparation; and, in view of the health emergency caused by COVID-19, teleworking and Internet training were used, and the cartographic update was performed. Field validations planned for August 2020 were put on hold, and the pilot census was tentatively postponed to November 2020 (RTC, 2020b).

Although self-enumeration via Internet had been established as a way to cover households that were missing after the end of field collection, the possibility of implementing this in as many households as possible has been considered, given the serious difficulties caused by the COVID-19 pandemic. Achieving this would require stages of awareness-raising and overcoming technological constraints, which is difficult to envisage given the tight schedule foreseen for the rest of the census activities. This jeopardizes the quality of the results. Owing to the situations described above, in August 2021 the National Institute of Statistics and Census of Costa Rica (INEC) announced that the population and housing census would be postponed to 2022 (INEC of Costa Rica, 2021a).

6. Cuba

Cuba's population and housing census had been scheduled for September 2022, but owing to the onslaught of the pandemic it has now been rescheduled for March and April 2023. The *de jure* census methodology will be applied through face-to-face interviews. Personnel will be hired to conduct the interviews using MCDs and global positioning system (GPS) technology, which will make it possible to georeference the data, integrate statistical and geographic information, and add value to the data. A single census form will be used, and a post-census coverage and quality survey will be conducted. Cartographic updating will be based on the National Geostatistical Framework.

COVID-19 has caused the same inconveniences in implementing the census in Cuba as in the other countries, and this has been compounded by problems in acquiring MCDs and creating the cartography. For that reason, the census was first postponed to November 2022 and then recently to 2023; and the fieldwork period was extended from 10 to 20 days. Progress has also been made on the census questionnaire, which includes topics from previous censuses and safeguards international comparability. Relevant information is also included for the creation of indicators to measure progress towards the Sustainable Development Goals (SDGs) and evaluate the National Economic and Social Development Plan to 2030 (PNDES), while also addressing new topics and adjusting old ones. The experimental census has already been designed and is planned for deployment in a municipality located 45 km from the capital. The application to capture data in MCDs will be developed externally, and technical assistance will be provided by CELADE to process the information. The field staff, consisting mainly of census takers and supervisors, will be paid. Concerns remain that the severe impact of the pandemic on the country's economy will affect the census budget, while the technical and professional support offered by United Nations agencies is recognized (RTC, 2020c).

7. Ecuador

The initial objective in Ecuador was to conduct a de facto census on 29 November 2020. The census of the dispersed rural area was to be held between 29 November and 6 December of that year. However, the activities in question had to be postponed to the following November. Data was to be recorded on a paper form during a face-to-face interview; secondary school students and teachers would be employed for this task, and optical reading would be done by scanner (RTC, 2020a). However, the project had to be redesigned as a result of COVID-19, and this meant that the amount allocated to the initial budget was reduced by 63%, and working groups had to be formed to rethink collection strategies that involved the possibility of using administrative records (citizenship cards, public utility databases of and property data). The definitive form was designed after conducting eight pilot tests; but the cartographic update and the pre-census of dwellings could not be performed and its schedule had to be extended until June 2021. This situation justified the National Institute of Statistics and Censuses of Ecuador (INEC) in raising the need to use technical assistance from abroad for planning, design, collection, processing, analysis and evaluation. The recent change of government and the social unrest that occurred in October 2019 also had an impact on the modifications and postponements of the census project. The census is currently scheduled for November 2022.

8. El Salvador

The most recent census held in this country dates back to 2007. Before the pandemic, around 2017, UNFPA provided support for census activities, such as developing a schedule and making progress on the content of the questionnaire; but it was not possible to set a date. As reported in an interview that the Department of Statistics and Censuses (DIGESTYC) gave to CELADE (DIGESTYC/Dirección, 2021), activities have since resumed; and all necessary documentation has been prepared, including the budget and risk matrix, to request a loan from the Inter-American Development Bank (IDB) to implement the population and housing census, the agricultural census, the economic census and the household survey.¹⁴ Once the loan is approved, the cartographic update will begin, which is expected to be done between March and December 2022. As currently defined, it will be a de jure census, with a pre-census and a four-week collection period. The most likely date is March 2023 and the information will be captured using MCD, without discarding the paper questionnaire in places where it is infeasible to use the devices. Results are expected to be delivered in December of the same year. This schedule would prevent the census from coinciding with the election to be held in 2024.

DIGESTYC is considered to have a stock of experience in the use of MCD, as this technology has been deployed for several of the institution's products, such as the household survey and cartography. The procurement process is currently under way; and whether the institution itself will design the application is not yet defined. Training needs to be provided for about 13,000 census takers; and, if the pandemic situation continues, this will have to be done online. Nonetheless, a mechanism for face-to-face training will be maintained, since this is considered very important for guaranteeing the quality of the census. As noted above, prior to the pandemic, progress had been made in preparing the census ballot, and issues had been agreed on with some sectors. Given that the pandemic has made it urgent to obtain data, many requests could arise that will need to be assessed. A census advisory committee similar to the one used in the household survey has been set up for this purpose and has given good results.

9. Honduras

The National Institute of Statistics (INE) of Honduras is in the process of establishing the basic characteristics of the 2020 census round, which it expects to hold in 2023, following the international recommendation to conduct censuses at ten-yearly intervals. It will possibly be a de jure census, and the feasibility of using mobile devices to collect the information is being studied. The pre-project is currently being established, in terms of the basic methodological definitions, budget and schedule, with technical assistance from UNFPA and CELADE. As a result, the process of budgetary discussion and request for financing is expected to begin. The ideal would be to use contracted staff to capture the data with MCDs, although the use of paper has not

¹⁴ This section is based on information supplied by the DIGESTYC director-general, Juan Carlos Salman, and social statistics manager, Francisco Monguía.

been ruled out, especially to preserve security in areas that are difficult to access. A traditional pre-census has been considered to allow for the cartographic update and also to prepare logistical and management inputs that meet the requirements for updating the sampling frame. The questionnaire needs to maintain a balance between historical and international comparability and the inclusion of some emerging topics.

10. Panama

At an April 2020 meeting it was mentioned that the census had been planned since 2016, in the de facto modality. It was also noted that implementation was planned for 24 May 2020, with data collection on paper forms, data capture by scanner and MCD in collective dwellings, following a pilot census implemented on 21 July 2019. However, towards the end of that year, an administrative difficulty arose, as the tendering package for the services of printing, logistics and processing of the questionnaires was challenged. Once the process was annulled, the Office of the Comptroller General of the Nation decided to request technical assistance from UNFPA and CELADE, which practically implied a revision and reprogramming of the project, including risk management and a new communications plan (RTC-CEA/CEPAL, CELADE, INE of Chile b, 2020). Then the COVID-19 pandemic intervened, with the first case being confirmed on 9 March 2020. To avoid halting the project completely, strict biosecurity and physical distancing measures were adopted, and 30% of the tasks were carried out by teleworking. In addition, the working group containing the UNFPA experts was maintained; and the need was raised to update the cartography once again, using satellite imagery, but with new field visits once the health crisis had been overcome. This made it urgent to schedule a new census date.

The website of the National Institute of Statistics and Censuses (INEC) of Panama announces an experimental census to be carried out in August–September 2021 (depending on the health situation), with the following objectives: evaluate the instruments for fieldwork coverage control and monitoring; measure the time it takes for an enumerator to fill out the questionnaire digitally and in writing; conduct prior tours in the areas and segments where the experimental census will be carried out; validate the operation of MCDs with the processes that would be used in data transmission and remote support in areas with and without coverage; and evaluate the processes for filling out the questionnaire on paper and its subsequent capture in the system. The enumerators would sweep through the selected areas during an eight-week period and would apply the concept of habitual residence; so it can be inferred that a de jure census is being considered, with a collection period of two months and the use of paper and mobile devices. These are new features in the next census, as is requesting the ID number (INEC of Panama, undated).

11. Paraguay

Paraguay has a de facto population and housing census scheduled for 22 August 2022 (MERCOSUR/INDEC, 2021), which will extend over two weeks in rural areas and indigenous communities. Direct household interviews will be conducted with paper questionnaires, and the possibility of completing the information or retrieving it by self-enumeration and use of the scanner for data capture will be offered. A digital pre-census will be carried out by geo-referencing the dwellings and enumerating the total number of people by sex, and major age groups.

On 13 March 2020, the Health Emergency Law was decreed after the first case of COVID-19 had been detected six days earlier. The law established requirements for physical distancing, quarantine and suspension of fieldwork, which meant that the activities had to be rethought. For example, it was decided that the training of high school students would be done online, and the first pilot test was rescheduled for October 2020, with the novelty of using a digital census questionnaire: taking advantage of the fact that the students were receiving telematics classes, they were asked to census their own dwelling, which represented about 3,600 households. In the second pilot test, which was planned for June 2021 because it required fieldwork, it was intended to recruit other groups of volunteers, such as university students, church members or other individuals, because high school students were still receiving distance education. These volunteers had to apply strict health safety protocols. Lastly, with the aim of accumulating experience for the next census round, and after the leaving analog era behind, it is intended to use the digital footprint of the buildings (a combination of satellite image records and algorithmic calculations that lead to georeferencing), build a geoportal and incorporate the citizen identification number that would make it possible to cross-reference the data with administrative records. The use of telematic media will be another innovation, considering that 30% of Paraguayan households have Internet coverage.

12. Dominican Republic

This country will conduct a *de jure* census, with the survey scheduled for the second half of October 2022, lasting two weeks rather than seven days as was the case with the previous census in 2010 (ONE, 2021). It has been necessary to strengthen the National Statistics Office of the Dominican Republic in several ways. These include increasing the number of staff in this area, creating working groups involving experts from across the institution, and ensuring that, in addition to the Census Department, the Survey Department and the Demographic Statistics Division also work on the methodological design.

Numerous specific tests have been undertaken, and the pilot test started on December 3, 2021. New features include the following: inclusion of the ID number, which will make it possible to link with administrative records; change of the minimum age required to be asked fertility questions, from 15 years in the previous census to 12 years in the present one; and inclusion of questions on environmental issues. The data will be collected through face-to-face interviews using MCDs: the National Statistics Office has tested them in several surveys and is using them to update the cartography. The administrative instrument that sets the census in motion is a presidential decree, and on this occasion there will be two of them: one declaring the census as a national priority, and the other setting the date and specifying other methodological aspects.

It should be noted that when all activities were suspended because of the pandemic, the National Statistics Office had already made progress in preparing the census. The documents that had been produced then had to be altered owing to the methodological adjustments that are being implemented, particularly in terms of technology. Also, in March 2020, the cartography had been updated in 97% of the territory, but the update is being repeated to be as close as possible to the census. The pandemic has not been the only setback, since the updating work has had to be suspended again owing to cyclones and, in the border area, because of the assassination of the President of Haiti. In the update, dwellings are counted (not households or persons), and this count is verified with the information obtained in the previous update. During the census stage, before the enumeration is performed, the census area is visited to take note of the number of households and persons. Strictly speaking, therefore, there is no pre-census. The cartographic and operational segmentation is done using data on the dwellings together with **distance and population estimation parameters**.

The possibility of complementing the data collection process with MCD is being studied: the self-enumeration would be done on paper, using a form that would have a small number of questions; and the census taker that collects the form would enter it in the MCD. These modalities would be used with households that did not accept the face-to-face interview, or if the suitable respondent could not be located. As a collection monitoring mechanism, there is a system for generating indicators based on the data collected by the enumerator. This system produces alerts on areas in which inconsistent information is being obtained. At the time of the interview, it has not been decided whether a post-census coverage survey will be carried out.

13. Uruguay

Uruguay's population and housing census is slated for 2023, so that the next census, of the 2030 round, can be based on administrative records (MERCOSUR/INDEC, 2021). It is therefore likely to be the last census using traditional methodology. It will be a *de jure* census using hired census takers who will be required to use electronic capture devices, which may be replaced with self-enumeration via Internet (eCensus). It was intended to conduct the pilot test in October 2021 and the experimental census in April 2022. A post-census evaluation survey will also be carried out. The following innovations and modifications will be introduced: (i) along with the traditional census, a pilot test of a census will be conducted with administrative records; (ii) the single geographic address system will be strengthened with spatial data infrastructure (SDI), which will make it possible to obtain a georeferenced address system. According to the census project document (INE of Uruguay, 2021), data collection is scheduled for May 2023, with a few weeks provided for field coverage recovery. The census moment will be decided *ex post* and will be the date on which 50% of the registered persons are reached. A single questionnaire will be used, with a quality and coverage monitoring system during the survey and the post-census coverage survey. The results will be delivered in the third quarter of 2023. For the register-based

census, the coverage of the universe, variables and quality will be evaluated; and the current gap between the traditional census and the register-based census will be determined. Identity card data need to be captured to link the cases with the administrative records. This baseline will be updated annually for several years leading up to the 2030 register-based census.

14. Bolivarian Republic of Venezuela

The fifteenth National Population and Housing Census of the Bolivarian Republic of Venezuela was ordered by Decree 3.990 of 23 September 2019. In this decree, the President of the Republic instructed the National Institute of Statistics (INE) to undertake the census and created the National Council of Geography and Statistics to plan, organize and coordinate the State geostatistical system.¹⁵ It is important to note that the census is taking place in the midst of two adverse scenarios: the COVID-19 pandemic and the economic blockade that has been imposed on the country for several years. This has led to a reduction in available resources and caused serious difficulties in collecting data in the field, owing to biosecurity problems that limit the possibility of face-to-face interviews, among other restrictions.

In the pre-census phase, the cartography was updated using MCDs, which has enabled georeferencing by capturing the points of property units on the digital maps and assigning them a unique QR code that unequivocally identifies them in national territory. Training will be provided in three modalities: online, blended and face-to-face. The census data will be collected in two ways. The first will be self-enumeration through a digital form (eCensus), which will be carried out in two phases: in phase 1, public administration staff will be invited, and in phase 2, access will be extended to any Venezuelan resident who wishes to self-enumerate. This information will be verified and updated at the time of the field survey. For example, the age captured in 2020 is automatically updated in 2021 based on the date of birth; and other variables are updated through the questions asked by the census taker. The second way of collecting census information will be the field collection through face-to-face interviews carried out by census takers equipped with MCDs (smartphones assembled in the Bolivarian Republic of Venezuela). For the fieldwork, 3,000 nodes or points will be created where the workload will be distributed and compiled, and the data collected will be coordinated and validated territorially. Owing to the difficulties mentioned at the outset, it was decided to use the modality described by the United Nations as “traditional enumeration with yearly updates of characteristics” (United Nations, 2010). This means that a short questionnaire will be applied to the general population and an expanded census form will be used in special surveys, corresponding to the traditional form. At the time of the survey, the process will be supervised on a random sample basis by staff from headquarters.

The census stage began on 15 April 2020 with self-enumeration, but only for public-sector employees. It was not until March 1, 2021 that access to the entire resident population was enabled —access that continues to date and which has allowed 5 million people to be covered, representing 16% of the expected total. Apart from the eCensus, special surveys were undertaken with the *Gran Misión Vivienda Venezuela* (GMVV) housing programme and in the socialist mission bases. The activists belonging to these institutions, known as *brigadistas*, serve as census enumerators, and the staff hired for the census supervise and coordinate at the local level. It is planned to initiate the “pandemic census form” (or shortened questionnaire) once vaccination conditions at the national level permit.¹⁶ For the follow-up and monitoring process, a situation room will be set up. There will also be a tool for permanent diagnosis, follow-up and control of the enumeration at different levels (national, state, municipal and borough), in terms of coverage and data quality. It will also be possible to audit management and provide inputs for corrective action during data collection. In the post-census stage, an ex post evaluation is planned, in order to measure or estimate the census omission rate.

¹⁵ This section was based on the interview given by Raúl Pacheco, President of INE of the Bolivarian Republic of Venezuela, and his team. Documentary information provided by that agency was also used.

¹⁶ The ballots to be used are the following: (i) self-enumeration ballot or basic questionnaire, containing 80 questions directed mainly to public employees who were invited to use this modality; (ii) extended census ballot of 100 questions directed to missions, rural areas, and homes, households and individuals of indigenous communities; (iii) pandemic-era census ballot or reduced questionnaire of 25 questions; and (iv) ballot for communities of indigenous peoples.

C. Conclusions on the progress and challenges of the 2020 round of censuses in Latin America

The information obtained on the 2020 round of censuses in Latin American countries, as of October 2021, shows that the census tradition in the region is being maintained, despite the direct impact that the pandemic has had on statistical operations generally, and censuses in particular given their magnitude and complexity. In some countries where the census was scheduled for 2020 or 2021, such as Argentina, Brazil, Costa Rica, Ecuador or Panama, the process had to be suspended when several activities of the pre-census stage had already been carried out, for example, cartographic updating, pre-census, testing and pilot censuses, manual development, software development and staff training. All of these activities had been undertaken mainly using the face-to-face interview and paper and mobile data capture devices, which was recommended prior to the pandemic.

The statistical institutes had to introduce major changes to respond to the urgency of the pandemic. These included the following in particular: the use of administrative records to complement the housing directories in the case of censuses; telephone numbers in the case of household surveys; self-census methodologies, either in web questionnaires (eCensus) or in paper questionnaires that the institutes' personnel leave and then return to collect; the creation of systems for conducting computer-assisted telephone interviews (CATI); the rapid adaptation of traditional training systems into fully virtual or hybrid systems; and the design of monitoring and management control systems for these blended collection methods. All of these innovations provide invaluable experiences in knowledge creation and learning, but they need to be developed further, analysed and tested with varying degrees of exhaustiveness so that censuses can be implemented on the basis of these alternatives.

As table II.1 shows, in five of the region's countries the population and housing census was scheduled for 2020; in seven others it was planned for 2021 or 2022, and in three for 2023. In the Bolivarian Republic of Venezuela, data collection through eCensus began in 2020, but only for public employees; so the basic requirement of universality that applies to censuses was not fulfilled. Access to the system was offered to all residents only in 2021, which is why this country has been included in the 2021 group for the purposes of this publication. Moreover, in the Bolivarian Republic of Venezuela country, field data collection is expected to occur when pandemic infection rates decline and vaccination progresses.

Cartographic updating is possibly the activity that has had to be suspended and restarted in the largest number of countries because of COVID-19, with the consequent additional costs affecting the budget. However, it is important to acknowledge the tenacity shown in arriving at the census with cartography updated in the field, in addition to the use of cadastral databases, address registers and other administrative records for quality control and continuous updating. The postponement of the censuses, and the health conditions in which the data are to be collected in some countries, make it necessary to change methods and protocols, and also to adjust the questionnaires. This requires rigorous testing and both pilot and experimental censuses, to adapt innovations and ensure coverage and good quality data. It is difficult to obtain information on tests that were conducted prior to the pandemic and are being repeated or augmented; but several countries are known to have an extensive pilot testing plan. In particular, these include technology-specific and multimodal tests that combine several forms of data collection, after which the databases need to be integrated.

The pre-census, or prior count of dwellings, also continues to be programmed, although it is not always clear whether a walk-through is done to identify dwellings and distinguish them from other buildings, premises and structures. There is a growing tendency only to do a cartographic update and a building count, without performing a pre-census in which doors are knocked on and people are counted.

Arriving at the census survey without having specified whether the buildings are dwellings means that this task is delegated to the enumerators and supervisors of the enumeration areas; and, given the number of personnel to be trained, these have a vaguer understanding of the concepts than the updaters who receive specific training and are checked more closely. Moreover, the planning of field staff workload is based on uncertain data; and the housing census is left with fewer comparison and coverage control mechanisms. The cadastral databases and other administrative records contribute to the housing count, but they do not make it possible to obtain the exact number of dwellings. Nor is their quality homogeneous, since the databases may be up to date in some countries, but in others not, which generates a coverage error from the outset.

Table II.1
Latin America: characteristics of the pre-census stage and scheduling of the 2020 round of censuses that had not been held before that year, 2020–2023

Countries	2020 census round		
	Data source	Initial programming	Rescheduling because of COVID-19
Argentina	D, I, W	De facto census planned for 2020, with paper and scanners	De jure census planned for 2022, with eCensus, and paper and scanner
Bolivia (Plurinational State of)	D	De facto census planned for 2022, using paper and scanners	
Brazil	D	De jure census planned for 2020, with MCD and eCensus	De jure census planned for 2022, with MCD and eCensus
Chile	D	De jure census planned for 2022, with MCD	De jure census planned for 2023, with MCD, eCensus and CATI
Colombia	D	NA	
Costa Rica	D, W	De jure census planned for 2021, with MCD	De jure census planned for 2022, with MCD and eCensus
Cuba	W	De jure census planned for September 2022, with MCD	Census planned for 2023, with MCD
Dominican Republic	D, I	De jure census planned for 2022, with paper and scanners	De jure census planned for 2022, with MCD
Ecuador	W	Census in fact planned for 2020, in paper form	Census planned for 2022: it is being defined whether it will be de facto or de jure, and whether paper or MCD will be used
El Salvador	D, I	De jure census planned for 2023, with MCD	
Guatemala	D	NA	
Haiti	-	NI	
Honduras	-	De jure census planned for 2023, with MCD	
Mexico	D	De jure census starting in 2020, with MCD and eCensus	
Nicaragua	-	NI	
Panama		De facto census planned for 2020, with paper and scanners	De jure census planned for 2022, with MCD
Paraguay	D, W	De facto census planned for 2022, with paper and scanners	De facto census planned for 2022, with paper and scanners
Peru	D	NA	
Uruguay	D, W	De jure census planned for 2023, with MCD and eCensus (the latter added later)	
Venezuela (Bolivarian Republic of)	D, I	De jure census starting in 2021 for all residents, with MCD and eCensus	

Source: Economic Commission for Latin America and the Caribbean (ECLAC), based on documents, conferences, webinars and interviews with managers of the respective national statistical institutes.

Note: D = document; I = interview; W = webinar; NA = not applicable; NI = no information; MCD = mobile capture device; and CATI = computer-assisted telephone interviews.

Table II.1 shows that most of the region's countries are implementing de jure censuses. In some countries where it was traditional to conduct de facto censuses and the 2020 round had been planned on this basis, it was decided to switch to the de jure modality when activities were resumed once the pandemic restrictions had been lifted. This happened in Argentina and Panama, for example. In Ecuador, tests are being carried out to decide whether to follow suit. In short, of the 18 countries for which census data are available, in 13 a de jure census has either been conducted or it has been decided to do so, in one a decision is being made, and in two others de facto censuses are planned.

In countries where a de facto census is conducted with data collection on a single day, the census moment corresponds to the census day.¹⁷ In countries where the data are collected over a longer period, the census moment is determined in different ways. In Brazil, for example, the questionnaire asks, "How many people were living at this address on 31 May 2022?". In Uruguay, in contrast, the census moment will be determined ex post as the date on which 50% of registered persons have been reached. The longer the collection period,

¹⁷ Census data is deemed to be collected on a single day when the collection corresponding to the urban and urbanized areas is done in a single day, and the rest of the information is collected over a longer period that also includes field coverage recovery. This mode of collection usually coincides with the concept of a de facto census, which captures the population that "spent the previous night" in the dwelling being recorded.

the more inaccuracies are introduced owing to the vital events that occur during that interval of time. In the 2020 round, collection periods of longer than one day vary from two weeks in the Dominican Republic to 11 months in Colombia; up to now, the most frequent period has been one month.

Technological innovation in terms of data collection instruments during the fieldwork has been another of the challenges observed in the region. In all countries in which the census will be conducted in 2022, the use of mixed data capture methods is being considered to a greater or lesser degree. This raises the need for more complex monitoring and follow-up systems, especially if the methods will be applied simultaneously rather than sequentially. For the 2020 round, most countries have decided to use MCDs as the main data collection medium, owing to the advantages they offer in terms of incorporating warnings, guiding the census taker, detecting inconsistencies and obtaining results more quickly. In most countries these devices are complemented by other technologies, such as eCensus or telephone interviewing, which in some cases are used simultaneously, or in others they are used to some extent sequentially or for field coverage recovery only. In other countries, paper is used in areas where mobile data collection is not recommended. The use of different technologies makes the census more complex, and, before making the decision, the technologies need to be trialled sufficiently (monitoring and follow-up systems) at all stages. As field collection moves away from the most critical moments, and vaccination coverage expands, there will be less need to deploy so many alternatives.

D. Census, administrative records and pandemic

The use of administrative records to obtain demographic data has been gaining momentum around the world. Sweden was one of the first countries to consolidate its statistical system for this purpose. “A statistical Population Register can be created by combining five sources: the civil register for persons with ID numbers, the civil register for persons without ID numbers, the birth register, the death register, and the migration register” (Wallgren and Wallgren, 2021, p. 13).

Spain is the country with the largest population in which the traditional census has been replaced with a register-based census, an experience that began with the 2000 round. Box II.2 describes the experience of the 2001 and 2011 censuses, as well as what is planned for the 2021 census. Spain has one of the main sources of data that can be used to implement this type of method, namely the Municipal Register of Inhabitants, which each year provides data on the population according to place of residence, sex, age, nationality and place of birth.¹⁸ This data source has been complemented with continuous records from other institutions, such as the cadastre, which supports the housing census and sample surveys.

Box II.2

Spain: the National Statistics Institute's route to the census based on administrative records in 2021

The 2001 Spanish census used data from administrative records for the first time, to complement the traditional population census. Certain fields of the census questionnaires were pre-filled with information available in the census roll. The population only had to alter the information if it was incorrect. For the remainder of the variables, the questionnaire had to be completed. It can therefore be said that the 2001 census represented the start of a path that could lead Spain to a register-based census.

The Spanish National Statistics Institute (INE) has been designing a project to create an integrated sociodemographic information system. The project, known as *Estudio Demográfico Longitudinal* (EDL), aims to link different sources to build a large longitudinal database that

includes the main demographic characteristics. The database would be built using standards similar to those used to create register-based statistical systems in the Nordic countries. The census roll would serve as the main basis of the new source, to which new variables would be added from the land cadastre, social security files, the Public State Employment Service (INEM) and natural population movements, among others. One of the objectives of INE would be to adapt the census operation to the availability and quality of EDL data, and to decide on the type of census to be carried out, according to the circumstances at any given time. Considerable work has been done on EDL and the experience thus gained can be used in other areas.

¹⁸ The Municipal Register of Inhabitants is an administrative record of residents of the municipality. Its formation, maintenance, revision and custody are the responsibility of the respective municipal councils, who must send the INE the monthly variations that occur in their municipal register data. The Continuous Census Statistics are prepared from the exhaustive use of the basic variables contained in the census files available at INE. It offers data on the population resident in Spain as of 1 January each year, according to place of residence, sex, age, nationality and place of birth. Data on place of residence are provided at different levels of territorial disaggregation: national, autonomous communities, provinces, municipalities and census sections (INE of Spain, 2021).

Box II.2 (concluded)

An analysis of the requirements and preconditions that must be met to develop a register-based statistical system shows that Spain has the three basic registers that are essential: the census, as the central population register; the land cadastre, as the register of properties and dwellings; and the Social Security register, as the basis for obtaining corporate data. Additional information could be obtained from the INEM registers (which would complete data on activity), from the registers on degrees awarded (for data on education level), from the tax agency records and from other registers with variables that are useful for statistical purposes (García-Román and López-Gay, 2010).

The 2011 census applied a data collection strategy that combined two sources: the weighted census file (WCF), which contained information on basic demographic variables for the entire population, and the sample, which contained information on all census variables, but only with respect to a subset of the population. The former was constructed using the census roll as the basic structural element, and adding data from other administrative registers, such as the tax agency, social security or birth bulletins. By linking these data sources it was possible to obtain a file with information covering the entire population, along with tools to confirm whether or not people were residing in Spain at the census moment of 1 November 2011.

Based on the WCF data obtained, 15 criteria were defined to classify each of the 47.7 million records into one of the following three groups: (i) secure (97.2%), which corresponded to records for which there was sufficient evidence that the person was living in Spain; (ii) erroneous (0.6%), which corresponded to records for which there was sufficient evidence that they should be removed from the database; and (iii) doubtful (2.2%), which corresponded to records for which there was insufficient evidence to determine whether or not they should be counted. Records in the first two groups were assigned a count factor of 1 and 0, respectively. Information from the sample was used to assign the count factor to the records in the third group. Foreigners accounted for 87% of the 1,046,000 questionable records. The weighted census file was used to calculate the population figures as the sum of the count factors of all records, and to determine their basic structure (sex, age, place of birth and nationality).

The second data source for the 2011 census was the sample, which was designed to provide information on the rest of the social and demographic variables with a sufficient level of disaggregation. With assistance from 4,000 interviewers and 900 group leaders, information was gathered in Spain's 8,116 municipalities, irrespective of their size. The sampling fraction varied according to the size of the municipality: the smallest being covered exhaustively. The final sample size was 4,107,465 persons (9% of the total population); 1,621,643 households and 2,326,247 dwellings.

Citizens were offered the possibility of answering the census questionnaire through three channels: (i) Internet (first option offered), which accounted for 38% of the responses; (ii) paper questionnaire (option offered if the household did not agree to respond via Internet), which accounted for 51% of responses; and (iii) personal interview, which accounted for 11% of responses and was the option used if the household remained uncooperative (Teijeiro and Vega, 2014).

In order to carry out a population and housing census based on this type of register, three essential elements must be in place: (i) an administrative population register that serves as the skeleton of the entire project; (ii) abundant sources of administrative data that make it possible to cross-check the census data in depth and incorporate variables on housing, the education system, the relationship with economic activity, previous residences, marital status and others; and (iii) a law that provides INE with access to these administrative data and safeguards the confidentiality thereof. Regarding the first element, Spain has a continuous municipal register which has been expanding and improving since 1996 and which makes it inefficient, if not counterproductive, to re-collect information on all individuals.

Work began on the construction of the 2021 census in mid-2014. In order to make a final decision on the methodology based on the data to be used, a study was performed that can be considered a general test of the population census. This work was done with reference to 1 January 2016 and was referred to as the 2016 pre-census file (FPC-2016). The first feasibility studies of the register-based housing census were also performed. It should not be forgotten that the census project actually incorporates two connected but distinct projects: the population count and the housing count.

The results of the FPC-2016 feasibility analysis were conclusive: conducting a census based on a combination of administrative records was perfectly feasible. In the case of the housing census, although it was also proven that the proposed method was compatible with the census regulations, there was still more work to be done and the analysis was expected to be completed by the end of 2019. In the most unfavourable case, the housing census would require fieldwork to be undertaken in a small part of the national territory (less than 2%), so it was essentially also possible to ensure that the housing census would be conducted on the basis of administrative data (Argüeso Jiménez, 2019).

With regard to the timetable for the 2021 census,^a the tasks to be carried out depend on the degree of success achieved in the current phase of cross-recording. Tentatively, the following milestones can be defined for the years indicated:

- 2020: a complete version of FPC-2018 should be available in the first half of 2020, and work on FPC-2020 should begin. Possible additional sources were to be identified and the final scope of the census was to be decided in terms of the variables to be studied.
- 2021: data collection for the Survey of Essential Characteristics of the Population and Housing (ECEPOV-2021) began on 1 April. More information was obtained and the technical draft of the survey was developed. Selected individuals could complete the questionnaire. From October 2021 to April 2022, the information would be cross-checked with administrative records, and the signs-of-residence method would be applied.
- 2022: the remaining sources will be incorporated and the census variables will be prepared. Preliminary census results will be published in the fourth quarter.
- 2023: complete census results will be published in the first half of the year, both for national purposes and to meet international demands for information.

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of J. García-Román and A. López-Gay, "Los censos de población basados en registros: una aproximación a las experiencias de los países nórdicos y a su aplicabilidad en España", *Papers de Demografia*, No. 364, 2010; C. Teijeiro Breijo and J. Vega Valle, "¿Cómo se hizo el censo 2011?", *Índice*, No. 60, July, 2014 [online] <http://www.revistaindice.com/numero60/p7.pdf>; A. Argüeso-Jiménez, "Los censos de población y viviendas de 2021 en España se basarán en registros administrativos", *Índice*, No. 74, July, 2019 [online] <http://www.revistaindice.com/numero74/p10.pdf>.

^a See [online] https://www.ine.es/censos2021/censos2021_calendario.html.

The challenges of the new methodology are captured in Domingo, Bueno and Treviño (2021) in which, through a survey of producers and users, the authors conclude that there are concerns about the quality of the data to be linked, namely those from the census roll, administrative records, big data and the complementary survey. The census roll may be out of date and difficulties are encountered in correctly capturing the foreign population. Administrative records are known to be sensitive to the relationship that the citizen may have with public administration, so there may be a “time lag” in the veracity of the data. In the case of big data, it is considered difficult to reconcile their objectives with those of public policy. Lastly, the complementary survey is considered insufficient for territorial disaggregation and daily mobility studies, as well as for household structure, housing and kinship relations, or for migrants and persons at risk of social exclusion, among other population groups. Producers, for their part, insist on the advantages of lower costs, less complexity in the statistical operation and data of greater periodicity.

Latin American countries are at the start of this process, which has been driven by the restrictions imposed by the pandemic on face-to-face data collection and other fieldwork related to census operations. The use of administrative records as an alternative for obtaining demographic data has increased in the region, since these records represent data sources that already exist and that could contribute to the design of social and economic policies, or to knowledge of the population at risk of becoming ill with COVID-19 and dying from the disease. In this process, these databases have proven to have strengths and weaknesses, as well as inconsistencies, both at the individual level and when compared with each other. This makes it necessary to formulate an evaluation and improvement plan so that, in the short term, these registers continue to fulfil their functions and, in the long term, replace the census exercises as they are currently known. Therefore, while extreme care must be taken to avoid the temptation of expecting too much from administrative records as tools that can complement census data at this time, the opportunity should not be missed to invest in an infrastructure of inter-agency networks that will make it possible to move towards the improvement, completeness and exploitation of these records for statistical purposes, in order to start on the road travelled by Spain.

In 2017, the Knowledge Transmission Network (KTN) of the Statistical Conference of the Americas of the Economic Commission for Latin America and the Caribbean (SCA-ECLAC) and INEC of Ecuador convened the regional seminar titled *Potenciando el uso de los Registros Administrativos con fines Estadísticos para el seguimiento de la Agenda 2030* [Enhancing the use of administrative records for statistical purposes to monitor the 2030 Agenda]. The seminar reported on progress related to the regional diagnostic assessment of the statistical capacity of the countries to develop indicators for the Sustainable Development Goals of the 2030 Agenda from administrative records. Several countries were in the process of collecting the data, so the diagnostic itself had not begun; others had not responded to the invitation to participate, and in ten countries the inventory had been completed and progress had been made in the evaluation of these records using different quality indicators (ECLAC, 2017).

The main difficulties detected in the statistical use of administrative records were as follows:

- The lack of a legal framework in several countries enabling institutions to produce and share databases. This means that everything has to be done through cooperation agreements between the statistical office and the institutions or firms, and sometimes there are legal aspects of the sources that definitely limit their use;
- The frequent absence of methodologies, dictionaries and metadata in general, as well as the lack of conceptual standardization;
- The lack of mechanisms to ensure that the information is treated and safeguarded, so its use is avoided;
- The absence of policies for communicating administrative changes that affect the data and interrupt the series;
- The lack of conceptual understanding, detected among some of the staff in charge of the administrative register, which has even affected completion of the questionnaire;
- Budgetary constraints that prevent hiring sufficient staff to take charge of the registry and form teams to process the data and produce indicators.

In terms of strengths, the following were detected in some countries:

- The existence of key variables or a unique identifier at the national level to link the databases;
- The existence of security, backup and recovery policies that apply to storage.

Mexico was the only country to explicitly mention a law (the Law on the National Statistical System) which tasks INEGI with promoting the application of methods and standards for collecting administrative data in cooperation with the authorities responsible for the administrative register. Some national statistical institutes recognized that the exercise was interesting and that it clarified the limitations and opportunities provided by administrative records.

The use of administrative records to produce social indicators has certainly developed more effectively since the pace of the work programmes of the national statistical institutes slackened, particularly in the case of censuses. At the same time, the pandemic circumstances demanded more information from different areas and disaggregated in different ways, as noted above. It was for this reason that countries sought assistance to make better use of available administrative records. The experience of the most recent censuses in Peru and Colombia, which were carried out before the pandemic, is notable. In both countries, the census questionnaires asked for personal ID numbers, which were used to establish links with the administrative records for statistical purposes. This has been an initial step forward in this area.

Costa Rica, Chile and Uruguay intend to use the personal ID number in the next population census, to link the census data with administrative records and thus create a permanent population register in the future. The personal ID number is indispensable for improving and validating the quality of the census, and to lay foundations for the population register. However, in Chile and Costa Rica, the feasibility of asking for the ID number is still being appraised, because people might refuse to provide the information. In Uruguay, on the other hand, the aim is to conduct the first fully register-based population census by 2030, given the lower estimated cost per person and the possibility of having a continuous annual census with additional dimensions of analysis. For this purpose, INE would adopt the Scandinavian model, the architecture of which converges population, property and company or entity registers, which are integrated at the microdata level through identification keys. The system will serve as a benchmark in the pilot test to be performed alongside the traditional census scheduled for 2023.

III. Inclusion of questions and conceptual adjustments in the 2020 census round

During the intercensal periods, countries usually work on revising the content of the census questionnaires. They evaluate and analyse the questions contained in previous censuses, as well as historical questions and those included as innovations in the most recent edition. As a result of the evaluation, they propose to keep —possibly with some adjustments— the questions that worked well and to exclude those that did not. Work is also done on the conceptual innovations that need to be incorporated as a result of new developments, such as disability, ethnicity, gender identity and access to and use of information and communication technologies (ICTs). As a result of the coronavirus disease (COVID-19) pandemic and its impact on population dynamics, this exercise has been expanded as countries have found it necessary to consider the need to adapt certain traditional questions. This is because the pandemic may have altered age- and gender-related trends and structures, such as mortality, fertility and migration; and it may have caused other changes such as household composition, affecting customs, or in basic needs, such as access to ICTs and the use made of them, or study and work modalities.

As noted above, one of the measurements that may be affected is that of habitual residence. Although the essence of the concept remains unchanged, its practical application is affected. The temporary changes of residence made by families and individuals during lockdown, or the suspension of study or work activities or other reasons, may or may not be definitive; and this generates ambiguous situations for the questionnaire respondents. Accordingly, elements in the definition of habitual residence may need to be adjusted, and the concept made more operational. In addition, the training of enumerators and the examples and definitions given in the self-enumeration systems may need upgrading.

The following paragraphs analyse census questions that are being evaluated for inclusion or alteration to address COVID-19 pandemic-related information needs.

A. Concept of habitual residence

The concept of habitual residence is fundamental in *de jure* censuses because it defines whether or not an individual should be counted as part of a household and as an inhabitant of the dwelling being counted. The enumerator therefore has to decide whether or not to include the individual in the census. This decision affects household composition, the measurement of migration, and the spatial distribution of the population and its coverage in the census.

As can be inferred from box III.1, the concept of habitual residence used in the censuses is complex, since it depends on how long the person has been living in that dwelling and whether he or she intends to continue living there. The length of time used in the operational definition used in the censuses varies, and

can be chosen to be either 6 or 12 months. In some cases it is specified in terms of how long the person has been living in the dwelling; in others for how long they intend to do so; while in others no time period is established. Individuals who, for reasons of work, study or health, do not remain in their habitual residence for certain periods of time could be omitted or else counted twice, so it is important to test the definitions according to the characteristics of the country in question.

Box III.1

The concept of habitual residence in population and housing censuses

The document *Principles and Recommendations for Population and Housing Censuses, Revision 2*, addresses the concept of usual residence as follows:

B. Place of enumeration

Concepts relating to place of residence

1.461. In general, "usual residence" is defined for census purposes as the place at which the person lives at the time of the census, and has been there for some time or intends to stay there for some time.

1.462. Generally, most individuals enumerated have not moved for some time and thus defining their place of usual residence is clear. For others, the application of the definition can lead to many interpretations, particularly if the person has moved often.

1.463. It is recommended that countries apply a threshold of 12 months when considering place of usual residence according to one of the following two criteria:

- (i) The place at which the person has lived continuously for most of the last 12 months (that is, for at least six months and one day), not including temporary absences for holidays or work assignments, or intends to live for at least six months.
- (ii) The place at which the person has lived continuously for at least the last 12 months, not including temporary absences for holidays or work assignments, or intends to live for at least 12 months.

1.464. Persons who move frequently and do not have a place of usual residence should be enumerated at the place where they are found at the time of the census.

1.465. Regardless of the criteria used to define the 12-month period, countries should ensure that each person should have one and only one place of usual residence. Furthermore, countries should document the definition of place of usual residence that they have adopted for their census and also provide explicit instructions on how this definition should be applied at the time of enumeration to enumerators for use during an interview or to respondents when filling in self-administered questionnaires.

1.466. A number of special cases may be encountered in which the application may require some additional explanation as to the place of usual residence. Two of the more common examples where special consideration is required are as follows:

- (i) Students at boarding schools and living away from family homes at universities;
- (ii) Persons working away from their family home: this situation covers a wide range of cases including:
 - People who spend the working week (five days) in the area close to their work and weekends and holidays at the family residence;
 - Workers who constantly travel to different places, such as travelling salesmen, truck drivers and short-term consultants;
 - Workers on long term, or semi-permanent assignment to a location away from the family home. In many cases these workers will support the family by remitting portions of their wages to their families.

Source: United Nations, "Principles and recommendations for population and housing censuses: revision 2", *Statistical papers, Series M*, No. 67/Rev.2, New York, 2008; United Nations, *Principles and Recommendations for Population and Housing Censuses: Revision 3* (ST/ESA/STAT/SER.M/67/Rev.3), New York, 2017.

During the COVID-19 pandemic, many households and individuals changed their residence for a variety of reasons, whether for work, study, or family arrangements. As normalcy returns, many will return to their residences, but many may also decide to stay where they have spent the months of lockdown and restrictions. The point is that while the conceptual definition of habitual residence does not change, special attention must be paid to how it is applied in practice and to the training of the enumerators. A broader set of examples and situations needs to be presented, as the realities have become more complex and diversified as a result of the pandemic. Countries conducting censuses while still coping with these effects will need to be especially vigilant. Consideration should also be given to the fact that, when checking coverage during the operation, and also when analysing the results, data that may have been considered erroneous or suspect in the past may now be correct owing to the residence changes driven by the pandemic.

B. Question on deaths at home

Several of the regions countries have included a question on deaths in the home, in order to obtain information on adult mortality and to complement the measurement, in level and structure, that is obtained from a combination of vital statistics and the census. The suggestion for the forthcoming censuses in the region is that if the country decides to include the mortality in the home module, it should ask whether the cause of death

is related to COVID-19, as indicated in chapter VII.B.2 of *Recomendaciones para los censos de población y vivienda en América Latina. Revisión 2020* (ECLAC, 2021a). On the measurement of fertility and mortality, it expressly recommends that, if the country conducts its census at a date not far removed from the impacts of COVID-19, the mortality module should collect the name, age, sex and date (month and year) of death, for each deceased person. It should also include a question inquiring whether the cause was related to this disease (ECLAC, 2021a, pp. 53-55). It is also advisable to reconsider the reference period of the data. In this context, it could be extended beyond 12 months (using a date that is easy to remember and soon after the onset of the pandemic in the country). Countries that include these questions should make sure clear training is provided and put special mechanisms in place to support understanding at all levels: operatives, census takers, supervisors and respondents. Subsequently, it is essential to analyse coverage and quality errors, paying attention to how these affect the desired estimations.

C. Questions to measure internal and international migration

Pandemic-induced changes of residence, either within the country's borders or else to live abroad, entail migratory movements that need to be recorded and analysed for all purposes. These include validation of the census data; estimation of the population base for the projections; and the development of hypotheses on the future behaviour of migration as inputs for the projections, and the study of the migrations per se.

Censuses are an important source of information on migration and, in most of the region's countries, the only one available. As noted in section III.A, the challenge facing the next censuses, in measuring migration in general, stems from difficulties in identifying people's habitual residence and also the different movements that each person may have made in response to the crisis as experienced. Nonetheless, the recommended questions are the same as those traditionally used, but attention needs to be drawn to a number of points.

1. Questions to measure internal migration

Following the recommendations for measuring internal migration in the 2020 census round, questions on place of birth and place of residence at an earlier date should be included. Traditionally a five-year period has been used: but in the last decade the addition of another period of one or two years prior to the census has started to become established, to avoid relying only on a fixed reference date. This practice will make it possible to capture chain or return movements during the period under consideration (ECLAC, 2021a, p. 58). Accordingly, in the 2020 round of censuses to be conducted in the region, instead of the previous recommendation, if the census is conducted not long after the onset of the COVID-19 pandemic, the question about place of residence on two previous dates should specify five years before the census and March 2020. This will make it possible to measure the impacts on migration generated by the health crisis, considering March 2020 as the month when the outbreak of the pandemic was first reported in the media, irrespective of the actual date of onset in each of the region's country. In this case, it is again necessary to weigh the inclusion of both questions by implementing pilot tests, the results of which will ensure correct data capture (ECLAC, 2021a, p. 58). This will make it possible to explore the impact of the pandemic on the patterns and trends of migratory movements.

This suggestion does not ignore the associated difficulties, since at that very moment many people were "trapped" in a place through which they were merely passing and could not return home. This could generate confusion as to whether the respondent reports the place of residence in the strict sense or the place where he/she was when the mobility restrictions came into force.

It is also recommended to explicitly enquire about the place or country of habitual residence in de facto censuses, since this is fundamental for estimating migration in general.

2. Questions to measure international migration

International migration is measured using the internal migration questions on place of birth, year or period of arrival in the country, and habitual residence five years earlier. If the census also includes another period, information on the country of residence will be available at three points in time. In this case, the suggestion to include a question on habitual residence in March 2020 also applies for this purpose. If all countries

include these questions that on country of birth and country of residence in a reference period, then census data from one country provide information to other countries on their emigrant nationals or emigrant residents. Since 1970, the Investigation of International Migration in Latin America (IMILA) project of the Latin American and Caribbean Demographic Centre (CELADE)-Population Division of ECLAC, has compiled this information in a database with the characteristics of migrants, which is highly valuable for the study of international migration (ECLAC, undated).

D. Question on school enrolment and attendance

The pandemic had an impact on teaching and learning processes at all levels and throughout the education community. Educational activities had to be suspended at short notice; and it was necessary to react in record time to take advantage of, or install, communication technology infrastructure so that teachers and students could resume contact. However, inequalities in terms of access to, and use of, the Internet and in the stock of electronic devices, in practice left many students without real access to education.

In 29 of the 33 Latin American and Caribbean countries, mechanisms for maintaining the continuity of studies during the pandemic were set up under various distance modalities. These included Internet-based learning, off-line distance learning, and combined on-line and off-line modalities. Among online distance modalities, asynchronous virtual learning platforms were used in 18 countries, while just 4 offered live classes. Among the offline forms of distance learning, 23 countries broadcast educational programmes through traditional media, such as radio or television. As of August 2020, only 8 of the 33 countries included the delivery of technological devices among the measures adopted to implement distance learning activities. In addition, the strategies of 14 countries included the provision of teacher training resources, especially in terms of tools for the use and management of ICTs for this purpose.

Against this backdrop, statistics need to reflect the impact of the pandemic on education; and population censuses are not exempt. Questions on literacy and educational attainment in this data source have always been a challenge for statistical offices, and remain so. This is mainly because of changes in the curricula and nomenclatures used for educational cycles, and also for capturing the number of school years successfully completed. When posing these questions across all generations in a country, many people may have difficulty recognizing themselves in the way the questions have been framed, so statistical offices must trial many different modalities.

The censuses conducted during and after the pandemic have become more complex to prevent the aforementioned changes from affecting the comparability of the indicators and, at the same time, making it possible to identify and measure the consequences of the crisis. For example, the question on school attendance may not be understood when students are taking classes online or receiving some other form of distance education; so tests need to be conducted to ensure that the question is understood by all population groups and education modalities.

Similarly, the indicators of “education level attained” and “last year passed” may be affected by the decisions adopted by countries to make student assessment mechanisms more flexible, which in some cases meant postponing evaluations and not closing the educational cycle. As noted by the Economic Commission for Latin America and the Caribbean (ECLAC) and the United Nations Educational, Scientific and Cultural Organization (UNESCO), activities that serve as inputs for producing indicators have been suspended. In this context, special attention should be paid to preparation of the chapter on educational characteristics, in order to adapt the questions relating to their different indicators.

In addition, if it is decided to include questions on daily commuting to the place of study, relevant aspects related to the COVID-19 pandemic should be taken into consideration, depending on when the census is conducted. Firstly, care should be taken with the comprehension of the question if it is to be applied during periods of lockdown or reduced mobility for health reasons. Secondly, care should be taken with the roll out, objective and understanding of the question in hybrid cases of face-to-face and remote study (ECLAC, 2021a).

E. Question on ID card number

The United Nations principles and recommendations for population and housing censuses, revision 2, do not specifically mention the right to identity (civil registration and possession of an identity document) (United Nations, 2010). However, in some countries the 2010 censuses asked whether the individual had “civil registration” and others asked about “possession of an identity document”. These questions sought to ascertain the number of undocumented people and their characteristics, which would help in designing large-scale campaigns to improve civil registration coverage and increase the number of persons with ID documents (ECLAC, 2011b). The ID document was considered as an indicator of the protection of people’s rights, since it is the key to assigning and ensuring the coverage of social benefits to each inhabitant of the country.

During the intercensal period, the expanding use of administrative records and subsequent acceleration thereof to mitigate the impact of the pandemic on populations, have raised the need for an interface between the different databases. This has been provided by the personal identity card number.

Chapter II analysed the importance of including the identity document number, to link with the administrative records, and the advantages of obtaining such a large database. This chapter reviews the experiences, practices and effectiveness of requesting the personal ID number in the census, both in the questionnaire and in the fieldwork, along with communication campaigns and other relevant measures adopted to guarantee the quality of this information. CELADE-Population Division of ECLAC and the National Statistics Institute (INE) of Uruguay, supported by the United Nations Population Fund (UNFPA), organized a workshop featuring presentations by representatives from Colombia, Costa Rica and Peru (ECLAC/INE, 2021a).¹⁹ An important issue concerns the degree of acceptance of the question, the response rate and the risk of total rejection of the questionnaire. The non-response rate has been variable. In Costa Rica, for example, in the pilot tests conducted for the census, the non-response rate was 23% and in the pilot census this rose to 37%. In Peru, on the basis of experimental censuses, it was decided to exclude the alternative “Did not wish to provide information”; and, in the census itself, 9.5% did not remember the number. In the Colombian census conducted of 2018, 93% of the total census population gave information on their ID number. Colombia and Peru note that the ID number could be used for the intended purposes of cross-referencing with other databases, such as national surveys conducted for various purposes, or the pension, benefits and education systems, and persons with disabilities, among others. In Peru, the database with the largest number of variables was obtained to prepare the income poverty map and the chronic malnutrition the socioeconomic stratification map. The National Administrative Department of Statistics (DANE) of Colombia mentions that 25 of 30 administrative records coincide in their identification by over 80% with the National Registry of Civil Status (RNEC), and that integration of DANE statistical operations with administrative records has led to the creation of the Statistical Base Population Registry (REBP).

The countries of the region that are considering capturing this information in the next census should be mindful that including this question can be a good idea, provided it does not hinder the normal flow of the interview and does not trigger rejection. The decision should be accompanied by a longer-term statistical development project for the construction of a national population register. Moreover, the use to be made of the information should be transparent; the statistical law should support the principles of technical independence, confidentiality, transparency, and access to records by the statistical office to enable its secure use. In operational matters, during the training of field staff, emphasis should be placed on the correct way to write the data. In the case of data capture by scanner, the importance of informing the interviewee that the data provided are confidential and will be used for statistical purposes, should be reiterated to the field staff.

F. Questions on daily mobility

The pandemic revealed negative aspects of densely populated cities and organizational arrangements that require large movements of citizens and agglomerations in public transportation systems. The latter became reasons for the rapid spread of the virus, with the consequent impact on health and mortality, despite the fact

¹⁹ See Annex A5 for further information.

that cities had better health infrastructure. While lockdowns were imposed in nearly all of the world's cities, ways of working and studying underwent radical changes in terms of timetables and place, with a consequent effect on the use of the cities' transportation systems and infrastructure. Once the pandemic is under control, a return to the status quo ante is unlikely to be complete; for many family and work arrangements will probably remain in place, thus changing known mobility patterns. For these reasons, the questions on place of work and place of study may be of interest for the next censuses.

The document *Principles and Recommendations for Population and Housing Censuses, Revision 3* (United Nations, 2017) addresses the topic of place of work. An analysis of the experience of the 2000 and 2010 Latin American censuses shows the importance of asking separate questions on place of work and place of study, because a single question for the two concepts is confusing. Commuting to the place of study lacks international standards, but should be asked of the entire study population.

The recommendations for the upcoming censuses in the region (ECLAC, 2021a) recognize that the COVID-19 pandemic has led to a radical change in daily mobility habits in some countries; but this cannot yet be classified as transitory or permanent. In this context, if questions are asked about daily commuting to work or place of study, it is necessary to reconsider their wording, especially in periods of lockdown or State measures imposed to reduce mobility, in order to improve understanding of the question. It is also necessary to revise questions regarding the inclusion of hybrid methods of work or study that involve different combinations of face-to-face and telework or distance education (ECLAC, 2021a, p. 84). Traditional response categories should not be neglected either, especially those referring to multiple workplaces. As has been recommended for other questions, it is important to do sufficient testing, both if the question is to be included for the first time or if changes are to be made with respect to the previous census in terms of scope within cities.

G. Questions on information and communication technologies in the people chapter

The United Nations recommendations for censuses do not include the measurement of accessibility and use of ICTs at the individual level. However, as mentioned in edition No. 94 of the *Seminarios y Conferencias* series, CELADE-ECLAC Population Division “endorses the recommendation to measure the use of ICT goods and services at the individual level, specifically cell phone and Internet use (...) Comparing the results at the individual and household levels (even when it is understood that they measure different things: penetration versus use), shows that measurement at the individual level is clearly more useful for visualizing social and geographic inequalities, which are blurred at the household level. (...) Given that ICT access and use is explicitly included in the 2030 Agenda and that several indicators have been defined for monitoring the targets (in particular target 17.8 and indicator 17.8.1 Proportion of individuals using the Internet), the inclusion of individual-level questions is recommended” (ECLAC, 2019).

The aforementioned pandemic-induced changes in ways of studying and working fostered a marked increase in the use of telecommunications equipment —whether cell phones, tablets or computers with Internet access. Lacking these tools seriously affects children's and young people's access to education and the labour performance of the working-age population. Accordingly, in the course of 2020 and up to October 2021, several initiatives were launched to provide students and teachers with better equipment and upgraded Internet plans. Although these initiatives are clearly insufficient and their sustainability is unknown, there was certainly a change. The challenge for the forthcoming 2020 census round is to be able to measure the change in individual access to ICTs and the gaps that persist. It would be advisable to include a question on ICT use in the module on individuals, along with a set of questions on the use of computers, cell phones and Internet. These would use the last three months as a reference period and establish the age used for the questions on formal education as an international standard of comparison (ECLAC, 2021a, pp. 88-90). This avoids the need to use an additional age filter in the interview. In addition, the recommendation to incorporate questions on the availability of ICT goods and services at the household level is maintained.

IV. Design and implementation of electronic census questionnaires (eCensuses) in Latin America

According to the principles and recommendations for population and housing censuses, (revision 3) (United Nations, 2017), the use of electronic questionnaires for self-enumeration results in much lower operating costs. The electronic questionnaire is made available on Internet portals or sent by email with appropriate security, as an alternative to using paper questionnaires or mobile data capture devices (MCD) in face-to-face interviews. In the case of combined data collection (multimodal or mixed approach), it is necessary to have a housing control and follow-up system that guarantees the coverage and completeness of the responses (United Nations, 2017). The alternative of using electronic questionnaires, which, in addition to reducing costs, seeks to achieve efficiency in the data collection or solve immediate coverage problems, must aim to guarantee the quality and integrity of the data and obtain adequate measurements of the population's size and structure.

Situations associated with circumstantial events, such as the COVID-19 pandemic, budgetary constraints, natural disasters, citizen displacement and insecurity, among others, are increasingly leading to the avoidance of face-to-face interviews, so that in the future it will be necessary to use self-enumeration via Internet or the register-based census. For this to be possible, however, several problems and challenges still need to be resolved. These can be summarized as platform saturation; restrictions on the formulation of certain questions that are not fully comparable with other data collection methods (MCD, paper form); inappropriate inclusion in the census of private households of persons who, according to previous methodological definition, correspond to collective households; omission of second households in the dwellings and confusion in kinship relationships owing to the indeterminacy of the head of household, resulting in the exclusion of members who are habitual residents. The document *Lineamientos generales para la captura de datos censales. Revisión de métodos con miras a la ronda de censos 2020* (ECLAC, 2021b) describes in considerable detail how the census data collection processes can be improved by incorporating more technologies in the capture method. Thus far, the countries of Latin America and the Caribbean have aligned with the trend of conducting censuses with a de jure methodology, using MCD, which has been driven by the challenges posed to the region's national statistical institutes in data collection, as shown in table II.1 (chapter II). Given the level of development and coverage of the Internet in the region's countries, use of the electronic questionnaire as the only method of census data collection is still infeasible; so the countries tend to use more than one collection method (mixed), either sequentially or simultaneously. This makes the census process even more complex and leads to various types of errors originating from each of the methods. It has become necessary to develop more than one data collection system, in addition to unifying and integrating the data. In this context, there are several challenges in terms of roll-out in the field, quantitative control of the data collection, systems for analysis and monitoring of the data collected to generate timely reports by geographic levels, and the need to minimize the risk of generating different results by using one method rather than another.

A. Web-based self-administered questionnaires in Latin America

In the 2000 census round, several countries around the world pilot-tested electronic questionnaires, without the data collected being considered definitive, as it was only used to analyse the possibilities of implementing this type of census. In the 2010 censuses conducted in the Republic of Korea, 30% of the census universe was obtained from voluntary online questionnaires and another 30% by telephone surveys administered by a robot (BCN, 2016). By 2015, the proportion of Internet users in that country had reached 90% (ITU, 2020). In Latin America, Brazil piloted Internet self-responding in the 2010 census. Although the main modality for collecting census data was the face-to-face interview with MCD, if the household refused this, the enumerator would leave a letter inviting the household to complete the census via Internet. This procedure was poorly adhered to, possibly because it was not well publicized. Another difficulty concerned the mechanism for paying the census takers, since, although all the questionnaires completed over the Internet were paid, the problem arose when the household did not complete the questionnaire and the enumerator had to return to the dwelling to collect it in order to complete the procedure. This circuit generated problems with the census takers' remuneration (ECLAC/INE of Uruguay, 2021b).²⁰

The application of web questionnaires has had—or will have—different objectives in the 2020 round of censuses in Latin America. Colombia and Mexico used this methodology in the census stage (in 2018 and 2020, respectively), and Brazil has conducted pilot tests with a view to implementing web questionnaires in the next census. Internet coverage should be a basic element when deciding to use this resource. According to the International Telecommunication Union (ITU), 72% of the Mexican population had Internet access in 2020; in Colombia coverage was 65% in 2018, and in Brazil it amounted to 74% in 2019 (ITU, 2020). The simple average for the region stood at 63% around 2019.

In Colombia, web questionnaires were used in the 2018 population and housing census to obtain census data directly in the initial stage of data collection, which was planned to last for two months. These questionnaires were applied before launching the face-to-face operation in order to save time during the door-to-door collection. There was an open call allowing anyone to create an account and fill out the census questionnaire, in which the first questions were about georeferencing and updating the geostatistical framework. With this methodology, 12% of the population was covered. In Mexico, the main modality was the face-to-face interview using MCD, but respondents were invited to complete the electronic questionnaire in three cases: (i) at the respondent's request; (ii) when the respondent could not be contacted after three visits; and (iii) in areas where access was restricted. As a result, 0.1% of the data were collected through the electronic questionnaire. In Brazil, there are plans to return to the 2010 modality, collecting data online from households that request this method, from those who refuse the face-to-face or telephone interview, and in dwellings whose occupants are absent at the time of data collection in the area (ECLAC/INE of Uruguay, 2021b).

B. Adapting the questions to the electronic questionnaire format

Several questions need to be adapted to enable the respondent who completes a web questionnaire to understand it without doubts arising that force him/her to seek assistance (which would lengthen the completion time), or else to choose an answer at random, or to abandon the process directly. For example, Colombia's web questionnaire does not include the question on the occupancy status of the dwelling; but later, in the database, reference is made to dwellings with occupants present. In this case, the concept of habitual resident was highlighted because the electronic questionnaire could be completed from anywhere in the world, and the respondent needs to be very clear about who should be included as members of their household and refer to their place of residence in Colombia. Given that Mexico applied a basic form to the entire population and an extended form to a sample, the basic version was used in the electronic questionnaire.²¹ It was also necessary to modify the questions on place of residence and place of birth, by eliminating the option "Here". In Brazil, it is planned to apply the same form in all modalities, the only difference being that the electronic questionnaire will include a help function in each question (ECLAC/INE of Uruguay, 2021b).

²⁰ For further information on Workshop 2: eCensus, use of Web questionnaires, see annex A6.

²¹ The extended form contained all of the questions included in the basic form and added others to delve more deeply in specific topics. This means that respondents who completed the census through an electronic questionnaire did not provide data on the following: housing characteristics (16 questions), personal characteristics (27), international migration (13), other monetary income (4) and food (3).

C. Quality problems in the electronic questionnaire compared to other data capture methods

Circumstances that may have impaired the quality of the electronic questionnaire in Colombia include the following: weak technological skills among respondents for completing questionnaires in this format; fear of using these technological tools; and connectivity problems. In the tests conducted in Brazil, the omission of persons in the dwellings and the existence of uncompleted forms were detected, so special attention will be paid to these issues in the census (ECLAC/INE Uruguay, 2021b).

D. Strategies to improve response rate

Tests to incorporate a new methodology must be very thorough, in order to identify problems that may hinder good performance and interaction with other forms of data capture when mixed methods are chosen, whether sequential or simultaneous.

Colombia decided to promote the use of the electronic questionnaire and informed the population that in the future individuals would not have to complete the census in person and that they could print the electronic census certificate and post it in a visible place or leave it at the door of the residential complex.²² Dissemination work was also carried out in public entities and, as from the pre-census stage, general invitations to complete the electronic questionnaire and generate the census certificate were broadcast live. In Mexico, the various tests carried out led to the conclusion that it was not feasible to conduct a census in electronic format. An analysis of other citizen responsibilities that could be carried out online found that not everyone completed the procedures through this channel. This suggested that the response would not be sufficient to replace the collection method. In the 2019 pilot census conducted in Brazil, a two-stage data collection strategy was proposed: (i) exclusively online; and (ii) combined (online and face-to-face). In the first phase, invitations to complete the electronic questionnaire were sent by mail to all registered households; but the acceptance rate was only 4.5%, indicating that the response rate remains low for the time being (ECLAC/INE of Uruguay, 2021b).

E. Integration of methodologies

In Colombia, once the electronic questionnaire data collection stage was completed, the fieldwork began with face-to-face interviews. Questionnaires on MCD and paper included a question to filter out households that had already self-completed the census online. As mentioned by the National Committee of Experts (CNE), households that had completed the electronic questionnaire were asked about new developments that had occurred in the household between completion of the electronic census and the census enumerator's visit. However, CNE was not very clear about the mechanism for reconciling the two pieces of information; and given the long period of time between one data collection and the other, changes in households are likely to have been frequent.²³ In Mexico, if the interview was incomplete, a letter was sent to the respondent inviting him/her to respond by self-enumeration or with telephone assistance, at which time all the information was requested again. If the respondent did not answer online, the interviewer or his/her supervisor would visit the dwelling again to complete the whole interview. Brazil does not foresee the integration of both data collection methods, which are considered independent (ECLAC/INE of Uruguay, 2021b).

²² This indication, which was given to encourage the use of the electronic questionnaire was not correct, because during the fieldwork the census enumerator had to verify certain data and, in the event of any variation, he or she would guide the respondent in updating the data which meant logging back on to the platform.

²³ The report of the National Committee of Experts mentions that the household had to report the code it had received. If this code was not available, the enumerator used the residents' ID numbers to check whether the household was already included in the database. In this case, if the household had completed the eCensus, the enumerator only had to request any new information arising between completion of the eCensus and the on-site visit. No questions were asked about whether all persons in the household had been reported in the eCensus to confirm that no one in the household had been omitted; that is, that all members of the household had been duly listed in the eCensus. The novelties to be included were: births, arrival/departure of new members, death of household members. The most frequent novelty was the omission of persons, especially among civil servants who were initially listed as single-person households. In the event of new developments, the enumerator informed the supervisor so that the electronic questionnaire could be reopened to allow the household to make adjustments, and monitoring was carried out until the closing of the census. The inclusion of new items implies a change in household composition, especially in the case of births and deaths. The household is reflected as it is at the time of the on-site visit or of the adjustments, which may even have affected its structure (CNE, 2019, p. 23).

F. Management of the possibility that there is more than one household in the dwelling

Colombia's presentation does not address the issue of how other households in the dwelling were identified, or whether the group of persons for whom the questionnaire was being completed comprised two households under the census definition. It was noted that the electronic questionnaire does not include the sequence number of the household within the dwelling, since it was not required. This was because the questionnaire was completed by household and did not depend on a sweep of the dwelling. In Mexico there were no problems with the household concept because it was not included in the census. In the 2010 census in Brazil, there were also no problems, since an algorithm based on two questions that identify cohabiting families is used to capture the family unit. The questions that posed problems in the electronic questionnaire are the same as those that cause difficulties in the face-to-face census (ECLAC/INE of Uruguay, 2021b).

G. Recommendations for future censuses

The following are identified as lessons learned: (i) test the capacity of the technological infrastructure to avoid having the platform collapse when faced with a massive influx of users; (ii) undertake a broad awareness-raising process on the electronic census, including data security; (iii) ensure the establishment of a user help centre to resolve doubts and clarify instructions on the completion of the census; (iv) include in the aids and guides application for the completion of the information; and (v) monitor the results to avoid bias and coverage problems in terms of households and individuals. It is important to systemize the entire self-enumeration process, define a testing plan (systems, volume, ethical check, penetration tests) and keep a record of the households that respond via Internet (ECLAC/INE of Uruguay, 2021b).

There are no studies or test results in the region that reveal differences in the quality of responses between census interviews conducted face-to-face and those that used an electronic questionnaire; or if there are such studies, they were not available. Although it might be assumed that that latter should be of higher quality, because it demands less interaction and interpretation, this does not take into account the lack of understanding and digital skills among respondents. As long as the electronic questionnaire remains a less-used tool among the total census population, the fact that it has a different source of error than the face-to-face interview, which is the primary method, may not be very relevant. However, as the use of this instrument becomes more common, studies of these errors (mode effect) should be available before the census is conducted, to have advance knowledge of what these errors are and how they will be dealt with when integrating the census data.

V. Conclusions

The life-changing events triggered by the COVID-19 pandemic that spanned the five continents were experienced differently in each country—including those of Latin America and the Caribbean. This depended not only on the specific geopolitical conditions in each country, but also on the demographic, social and economic structures prevailing in them, according to their different states of development. The objective of this study was to assess the status of the 2020 round of population censuses in the region, gauge the impact of the COVID-19 pandemic crisis on the census processes, learn about the different strategies adopted to conduct population censuses in the midst of the health emergency, and analyse their potential for obtaining information that is fundamental for mitigation and recovery policies. The Latin American and Caribbean Demographic Centre (CELADE)-Population Division of ECLAC, the United Nations Statistics Division, the World Bank and other international organizations have launched various initiatives to ascertain and evaluate the impact of the health crisis on statistical processes in general, and on population and housing censuses in particular. These confirmed that the closure of the respective offices had serious repercussions on the census calendar, budgets, protocols and training and collection methods, to mention the most significant. In Latin America and the Caribbean, the effects were more pronounced, because the offices were closed immediately at the onset of the pandemic and reopened more slowly towards the end of 2020. As a result, periods of lockdown and teleworking lasted longer than elsewhere. Nonetheless, it is worth noting the role that statistical agencies had to play in measuring and monitoring the progress of the pandemic, thereby providing crucial support to health authorities and contributing social welfare, in a region where administrative record systems were less developed.

The seriousness of the situation encountered by all national statistical offices prompted a virtual meeting of experts in February 2021. At the meeting, it was recommended that sufficient time should be provided to test new processes, applications and systems before altering the design of enumeration modalities. Testing the adequacy of the integration of data collection systems is especially important for meeting the operational challenges of managing multimodal data collection processes.

The pandemic had a major impact on the scheduling of the 2020 round, since a large proportion of the region's censuses were programmed for 2020, 2021 and 2022. Many censuses had to be postponed or suspended; and several countries after postponing their census until the year following that originally planned, have had to reschedule again because of prolonged restrictions owing to new waves of infection and low vaccination rates. Even some of the censuses scheduled for 2022 have been affected, through lack of funding and restrictions affecting the fieldwork needed in the pre-census stages, as can be seen in table A1.2 of annex A1.

Given these situations and difficulties, population and housing censuses in the region are undergoing transformations in terms of methodology and modes of data collection. These include the transition from *de facto* to *de jure* censuses. Most of the countries had already adopted this type of census operation in the 2010

round; and Chile had done so for this round, prior to the pandemic. In response to the crisis, and with the aim of allowing longer time for fieldwork and prioritizing working modalities that protect the health of households and census takers, Argentina, Panama and possibly Ecuador have also now adopted this modality, according to their preliminary proposals. This has posed a range of challenges, such as longer collection periods and difficulties in setting the reference moment.

One of the challenges facing the next censuses concerns the definition of the census questionnaire, both because of the adjustments that will need to be made to some questions or implicit concepts, and also because of the incorporation of new questions to capture the impact of the pandemic more effectively and highlight mitigation and remediation policies. Even before this disruptive event occurred, the national statistical institutes were grappling with the challenges of incorporating new questions in the census forms to meet requests from different governmental and societal sectors. They were also facing budgetary constraints, in terms of amount and timing, which put implementation of a large-scale and complex project, such as a population and housing census, at risk.

In this complex scenario, the content of the census form needs to be revisited. Adjustments will need to be made in several concepts and definitions, and new questions introduced that will require rigorous testing to guarantee the quality of the information obtained. One of the basic concepts of the census is “habitual residence”, which has been affected by temporary changes owing to lockdown, changes in habits resulting from working and studying at a distance, and arrangements made by families to provide care and alleviate the economic crisis. All of the above have implications for household composition, migration, daily mobility and spatial distribution of the population, education, deaths in the home, access to and use of information and communication technologies (ICTs), among other matters studied in the censuses.

It is worth highlighting the significant progress that has been made with the adoption of modern technologies such as mobile data capture devices (MCD) and the electronic census (eCensus).²⁴ The application of MCD in ten Latin American countries that have completed their census, or are planning to do so in the second five-year period of the 2020 round, still requires evaluation and adjustments, since there are several technical and implementation difficulties that need to be resolved. Colombia’s experience with some of these can help countries that are innovating in this regard.²⁵ In the case of the eCensuses, there is little experience yet, as they were applied to just 12% of the Colombian population (ECLAC, 2019) and to 0.1% of the population in Mexico, which adopted this methodology for the coverage recovery phase. In Brazil, acceptance among the population is still meagre: according to the results of the experimental census conducted in 2019, only 4.5% responded positively to the invitation to complete the eCensus, which was sent by mail to all registered addresses.

The foregoing demonstrates the need for awareness of the real technical and human conditions of the national statistical institutes, and of the population’s social and cultural conditions. Otherwise innovations in census and survey data collection processes will be less successful. Sometimes technologies are imported from other countries with different levels of development and living conditions, which could be usefully adopted with adaptations. However, this will only be successful if the specific circumstances of the country in question are taken into account. Even when hybrid strategies are used—combining paper, mobile device, telephone and Internet collection methods—great care must be taken, since each methodology requires different designs, planning, training, quality and coverage control processes, as well as an analysis of their mutual consistency, which makes the census itself more complex. The urgency with which the next censuses are being prepared, coupled with the need to innovate, is putting work schedules under great stress, often sacrificing the completeness of pilot tests and experimental censuses, and increasing the risk of significantly impairing census quality and coverage.

²⁴ Colombia’s 2005 Census marks a turning point in the transition to the third generation, as it was the first to use mobile devices (MCD) for data capture. Since then other countries have adopted MCD, although in 2013 only 20% had done so. In its most recent census, conducted in 2018, Colombia moved to the fourth generation by allowing for self-enumeration (ECLAC, 2019, p. 23).

²⁵ On this, see CNE (2019).

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Annexes

Annex A1

United Nations Statistical Division surveys on the impact of COVID-19 on population and housing censuses

Table A1.1
First United Nations Statistical Division survey on the impact of COVID-19 on the censuses scheduled for 2020, 3 April 2020

Country	Census reference date	Main method	Impact of COVID-19 on the census scheduled for 2020	Information as of
Mexico	1 March 2020	Traditional census	Census Enumeration Completed in March 2020. Enumeration completed, amidst great budget cuts (16 surveys cancelled in 2019). Census was considered by the government as essential activity. Social distancing was implemented during fieldwork (180.000 enumeration interviewers). Census desk staff are working from home. Online and phone questionnaire encouraged. Fever tests during operation and washing hands campaign were implemented. Coverage is estimated at similar levels of 2010 census. Verification activities postponed. PES cancelled (too far away from census day).	15 April 2020
Saint Lucia	15 May 2020	Traditional census	After several consultations with relevant officials, including the Chief Medical Officer, a decision was reached following consultations with the relevant officials, to include the Chief Medical Officer to postpone the 2020 for at least six (6) months. This decision was made on the heels of the completion of the Training-of-Trainers activity. Thereafter, plans were advancing for the Training of Enumerators and Supervisors activity, but these plans had to be suspended (in keeping with the decision to postpone the census). A decision regarding a new Census Day will be made at an appropriate moment once the COVID-19 (Coronavirus) pandemic runs its course.	1 April 2020
Panama	24 May 2020	Traditional census	Panama's 2020 census is impacted by the Covid-19 pandemic. The implementation of the census has been affected by challenges to organize public events. We are working on the adjustment of the census project. We are reviewing the entire recruitment process for census-takers and supervisors and updating the risk matrix associated with the census. We will have to carry out a comprehensive review on the areas that must be updated again in the field (pre-census) and analyse the new costs associated with a new census date. We also intend to consult on the need to include new information needs in the census questionnaire. In addition, it is necessary to rethink the training processes, considering that many people should not be crowded together in one place. Great challenges must be overcome from now on, and surely in the coming months we would have to decide on the need to set a new census date, especially since the country's national budget would be greatly affected by the Covid-19 Pandemic.	1 April 2020
Cayman Islands	11 October 2020	Traditional census	The COVID-19 pandemic may impact the population and housing census. Despite the uncertainty, we are continuing with the planning of census 2020 in case we return to normalcy. The government (Cabinet) have not made a decision as to the conduct of the census later this year, but if the uncertainty continues, it is likely to be rescheduled.	24 March 2020
Argentina	28 October 2020	Traditional census	Pilot census not completed (at 70%), postponed to end Sep 2020. Census postponed until 2021, no confirmed date.	15 April 2020
Ecuador	29 November 2020	Traditional census	The census was originally planned for Nov 2020 and has been postponed. Ongoing cartographic updating cancelled, postponed to June 2021. Considering new methodologies, including: - Cartographic updating (big data, satellite imagery) - Population registers (administrative) - Innovative technologies (online, cell phone self-enumeration) - Rethinking questions for post covid-19 emergency (mortality, migration, economic crisis).	15 April 2020
Puerto Rico	2020		All in-person field operations have been suspended. We closely follow the guidance/restrictions issued by the Office of the Governor and will resume operations once the local government deems safe/appropriate to resume operations. While all in-person field activities are suspended, the self-response options (online, phone, paper) are still available.	15 April 2020

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of United Nations, "Responses to the 1st UNSD survey on the impact of COVID-19" [online] <https://unstats.un.org/unsd/demographic-social/census/COVID-19-SurveyT1/>.

Note: Aruba (no information), Barbados (1 May 2020, traditional census), Haiti (15 May 2020, traditional census) and British Virgin Islands (15 June 2020, traditional census) did not respond on census rescheduling.

Table A1.2
Second United Nations Statistical Division survey on the impact of COVID-19 on the preparation of population and housing censuses, December 2020–January 2021

Country	Did you have to stop or postpone preparatory activities for the population and housing census?	Impact on census preparation									
		Which of the following specific activities have been cancelled or postponed as a result of the COVID-19 pandemic?									
		Project planning document	Cartography/listing	Questionnaire content and design	Pilot census	Publicity	Stakeholder outreach	Procurement	Training	Another	What is that "other" activity specifically?
Anguilla	n.a.	-	-	-	-	-	-	-	-	-	-
Antigua and Barbuda	Yes	-	Yes	-	Yes	Yes	Yes	Yes	Yes	Yes	^a
Argentina	Yes	-	-	-	Yes	-	-	-	Yes	-	
Aruba	Yes	Yes	-	-	-	Yes	Yes	-	-	-	
Bahamas	Yes	-	Yes	Yes	-	Yes	-	Yes	Yes	-	
Barbados	Yes	-	-	-	Yes	Yes	Yes	-	Yes	-	
Belize	Yes	-	-	-	-	Yes	Yes	-	Yes	-	
Brazil	Yes	Yes	Yes	-	-	Yes	Yes	Yes	Yes	-	
British Virgin Islands	n.a.	-	-	-	-	-	-	-	-	-	-
Cayman Islands	Yes	-	-	-	-	Yes	Yes	Yes	Yes	Yes	^b
Costa Rica	Yes	-	Yes	-	Yes	-	-	Yes	-	Yes	^c
Curaçao	Yes	-	-	-	Yes	-	-	-	-	-	
Dominica	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	-	
Dominican Republic	Yes	-	Yes	-	Yes	-	-	-	-	-	
Ecuador	Yes	Yes	Yes	Yes	-	Yes	Yes	Yes	Yes	-	
Grenada	Yes	-	Yes	-	-	Yes	Yes	-	-	-	
Jamaica	Yes	-	-	-	Yes	Yes	-	Yes	Yes	-	
Mexico	No	-	-	-	-	-	-	-	-	Yes	^d
Montserrat	Yes	Yes	Yes	-	Yes	Yes	-	Yes	Yes	-	
Nicaragua		-	-	-	-	-	-	-	-	-	-
Panama	Yes	Yes	Yes	-	-	Yes	Yes	Yes	Yes	Yes	^e
Puerto Rico	No	-	-	-	-	-	-	-	-	-	
Saint Kitts and Nevis	Yes	-	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	^f
Saint Lucia	Yes	-	-	-	-	Yes	-	-	Yes	-	
Saint Vincent and the Grenadines	Yes	Yes	-	-	Yes	-	-	-	-	-	-
United States Virgin Islands	No	-	-	-	-	-	-	-	-	-	-
Uruguay	n.a.	-	-	-	-	-	-	-	-	-	-
Venezuela (Bol. Rep. of)	Yes	-	Yes	-	Yes	Yes	-	Yes	Yes	-	

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of United Nations, "Impact on preparations", n/d [online] <https://unstats.un.org/unsd/demographic-social/census/COVID-19-SurveyT2-2/>.

Note: n.a. = not available.

^a Establishment of a census office and recruitment of key personnel.

^b Fieldwork.

^c Organization of the data collection operation.

^d Census post-enumeration survey cancelled and replaced by a targeted municipal post-enumeration survey. Verification stage postponed.

^e Owing to the pandemic, a change in methodology is being considered to make the census less invasive. A second pilot census is planned.

^f Official launch of the census under the title "The Population and Housing Census is One Year Away!"

Table A1.3
Second United Nations Statistical Division survey on the impact of COVID-19 on the fieldwork schedule for population and housing censuses, December 2020–January 2021

Country	Impact on fieldwork		
	Census reference date (as scheduled prior to COVID-19 pandemic)	Did you have to stop or postpone or extend the fieldwork of the population and housing census?	What is the length of the extension?
Anguilla	1 August 2020		
Antigua and Barbuda	25 May 2021	Yes, it had to be postponed to 2022 or beyond.	Eight weeks starting May 2022.
Argentina	28 October 2020	Yes, had to postpone to 2021	In accordance with Decree 726/2020 the National Institute of Statistics and Census (INDEC) will have up to 60 days after the end of the public health emergency in matters established by Law No. 27.541, extended by Decree No. 260 of 12 March 2020.
Aruba	1 October 2020	Yes, had to extend the period of enumeration by weeks/months (in 2020)	Planned the enumeration between October 1 and October 10, and had to extend the enumeration to the first week of December. The post enumeration will be conducted in the first half of 2021.
Bahamas		Yes, had to postpone to 2021	
Barbados	1 May 2020	Yes, had to postpone to 2021	
Belize	12 May 2020	Yes, had to postpone to 2021	
Brazil	31 July 2020	Yes, had to postpone to 2021	
British Virgin Islands	15 June 2020		
Cayman Islands	11 October 2020	Yes, had to postpone to 2021	
Costa Rica	9 June 2021	Yes, had to postpone to 2021	Planned initial period: three weeks in June 2021; actual enumeration period: three weeks in September 2021 or in June 2022.
Curaçao	18 April 2020	Yes, had to postpone to 2021	
Dominica	15 May 2021	Yes, had to postpone to 2021	Six months.
Dominican Republic		Yes, had to postpone to 2022 or beyond.	
Ecuador	29 November 2020	Yes, had to postpone to 2021	The population and housing census was postponed but its extension did not change. The enumeration period will be in November 2021: one day in consolidated areas and one week in remote areas.
Grenada	12 May 2021	No, neither stopped nor postponed	
Jamaica	5 April 2021	Yes, had to postpone to 2022 or beyond.	Planned initial enumeration.
Mexico	15 March 2020	Yes, had to postpone to later in 2020.	One week of the Verification stage was conducted at the end of March, three additional weeks were planned in April but were postponed due to the pandemic. This stage was then conducted from mid-June to August, but not simultaneously in all states.
Montserrat	12 May 2021	Yes, had to postpone to 2022 or beyond	
Nicaragua			
Panama	24 May 2020	Yes, had to postpone to 2022 or beyond.	Based on a traditional de facto census (completed on a single day), a methodology for a de jure census is being planned with two months of fieldwork.
Puerto Rico	1 April 2020	Yes, had to postpone to 2021	From April to May 2021; change to September to October 2021
Saint Kitts and Nevis	16 September 2021	Yes, had to postpone to 2021	From April to May 2021; change to September to October 2021
Saint Lucia	12 May 2020	Yes, had to postpone to 2022 or beyond	
Saint Vincent and the Grenadines	15 June 2021	Yes, had to postpone to 2022 or beyond	
United States Virgin Islands	1 April 2020	Yes, had to postpone to later in 2020	Data collection was paused from March to June, 2020. Data collection resumed in June 2020.
Uruguay			
Venezuela (Bolivarian Republic of)	1 September 2020	Yes, had to postpone to 2021	First week of June to end of August

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of United Nations, "Impact on fieldwork", n/d [online] <https://unstats.un.org/unsd/demographic-social/census/COVID-19-SurveyT2-3/>.

Table A1.4

Second United Nations Statistical Division survey on the impact of COVID-19 on population and housing censuses, and approaches or methods that have been changed or adapted, December 2020–January 2021

Methods	Latin America	The Caribbean	Total countries
Use of administrative data	Costa Rica, Mexico	Aruba, Montserrat	4
Web-based data collection interview (CAWI) ^a	Argentina, Costa Rica, Mexico, Venezuela (Bolivarian Republic of)	Antigua and Barbuda, Aruba, Bahamas, Barbados, Curaçao, Jamaica, Saint Lucia	11
Computer Assisted Telephone Interview (CATI) ^b	Brazil, Mexico, Panama	Antigua and Barbuda, Aruba, Bahamas, United States Virgin Islands, Montserrat, Puerto Rico, Saint Lucia	10
Self-enumeration with paper questionnaire (mail-out/mail-back, drop-off/pick-up)		Saint Kitts and Nevis, Saint Lucia	2
Other changes or adaptations ^{c d e}	Ecuador, Mexico, Panama	Puerto Rico	4

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of United Nations, “Impact on collection methods”, n/d [online] <https://unstats.un.org/unsd/demographic-social/census/COVID-19-SurveyT2-4/>.

^a Argentina: the online questionnaire is being planned to supplement the face-to-face methodology.

^b Panama: shift from paper and pencil interview (PAPI) to computer-assisted personal interview (CAPI), employing approximately 6% of the staff estimated prior to the COVID-19 pandemic.

^c Ecuador: data retrieval via Internet and telephone; use of administrative data for data retrieval only.

^d Mexico: verification questionnaire adapted to maintain the census reference date. While CAWI and CATI methods were considered from the outset, self-enumeration invitations were mailed to some households during the quarantine period.

^e Puerto Rico: included in additional telephone interview operations and additional mailings.

Table A1.5

Second United Nations Statistical Division survey on the impact of COVID-19 on population and housing censuses, difficulties and challenges identified by countries, December 2020–January 2021

Country	Need to reduce face-to-face interaction	Personnel not available/ill	Funding limitations/constraints	Procurement difficulties	Mobility restrictions/problems with transportation	Closure of establishments	Other difficulties	No/minor difficulties	What is that “other” difficulty specifically?
Anguilla									
Antigua and Barbuda	Yes	Yes	Yes	-	-	-	-	-	
Argentina	Yes	-	Yes	-	Yes	Yes	-	-	
Aruba	Yes	Yes	Yes	-	-	-	-	-	a
Bahamas	Yes	-	Yes	Yes	-	-	-	-	
Barbados	Yes	-	Yes	-	-	-	-	-	b
Belize	Yes	Yes	Yes	-	-	-	-	-	
Brazil	Yes	Yes	Yes	-	-	-	-	-	
British Virgin Islands									
Cayman Islands	Yes	-	-	Yes	Yes	Yes	-	-	
Costa Rica	Yes	-	Yes	-	Yes	-	-	-	
Curaçao	Yes	Yes	Yes	-	-	-	-	-	
Dominica	-	-	Yes	Yes	-	-	-	-	
Dominican Republic	Yes	-	Yes	-	Yes	-	-	-	
Ecuador	Yes	Yes	Yes	-	-	-	-	-	
Grenada	Yes	-	Yes	-	-	-	-	-	
Jamaica	Yes	-	Yes	Yes	-	-	-	-	
Mexico	Yes	Yes	-	-	-	-	Yes	-	c
Montserrat	Yes	-	Yes	Yes	-	-	-	-	
Nicaragua									
Panama	Yes	Yes	Yes	-	-	-	-	-	
Puerto Rico	Yes	-	-	-	-	Yes	-	-	
Saint Kitts and Nevis	Yes	-	Yes	-	-	-	Yes	-	d
Saint Lucia	Yes	Yes	Yes	Yes	Yes	Yes	-	-	
Saint Vincent and the Grenadines	Yes	-	-	-	-	-	-	-	
United States Virgin Islands	Yes	-	-	-	-	Yes	-	-	
Uruguay									
Venezuela (Bol. Rep. of)	Yes	Yes	-	-	Yes	-	Yes	-	e

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of United Nations, “Challenges”, n/d [online] <https://unstats.un.org/unsd/demographic-social/census/COVID-19-SurveyT2-5/>.

^a Enumerator training could not be provided as originally planned and was conducted online.

^b Lack of office staff with experience in computer-assisted web interviewing (CAWI).

^c Increased non-response rate in the last week of March. Rescheduling and replanning of the subsequent stages, in an attempt to reduce the delay in publishing the results. Adaptation of data processing to teleworking to ensure confidentiality of information.

^d Additional costs incurred to purchase personal protective equipment (PPE) for fieldworkers and, in some cases, household members.

^e Coverage problems with electricity service or Internet.

Table A1.6
Second United Nations Statistical Division survey on additional measures to mitigate the impact of COVID-19 on population and housing censuses, December 2020–January 2021

Country	Other measures
	Please describe any other measures or actions you plan to take to minimize the adverse impact of the COVID-19 pandemic.
Antigua and Barbuda	Request additional budget for PPEs and providing to field staff. Coordination with the health authorities to enhance safety protocols to mitigate against the spread of COVID-19.
Argentina	Any other measures: online training of field staff, providing personal protective equipment (PPE) for field staff, minimize contact between field-workers and household members.
Aruba	Shortening of the census questionnaire to minimize the face-to-face contact between enumerators and the public. We provided field staff with masks and hand sanitizers.
Bahamas	Additional funding needed for Electronic Listing and Establishment of a Census Register of Households; Establishment of Help Desk and Call Center; Purchase of face masks and shields; Online training of field staff; additional publicity campaign.
Barbados	(1) Liaising with health officials obtain protocols as it relates to conducting field work. (2) Securing adequate amounts of PPE. (3) Modifying the budget to accommodate the cost of PPE. (4) Modifying the publicity campaign to educate the population on the new mode of data collection, and to reassure householders of the safety of Census 2021.
Belize	Provision of PPE for census staff; increased publicity campaign; increased number of reserve field staff.
Brazil	Online training of field staff, providing personal protective equipment (PPE) for field staff.
Cayman Islands	The census was postponed to October 2021.
Costa Rica	Online training of field staff, providing personal protective equipment for field staff, minimize contact between field workers and household members, strengthen communication (publicity campaign).
Curaçao	To shorten the census questionnaire. Create focal points to support households who are unable to fill in the questionnaire online.
Dominica	Increased cost in census advocacy (Need additional budget to assist in procurement of PPE, increased transportation cost resulting from minimizing contact among field workers).
Ecuador	Online training of field staff, providing personal protective equipment (PPE) for field staff, and implementing publicity campaign to assure the public.
Grenada	Exploring possibility of concessional credit financing, use of PPE, use of Internet as last resort option, use of telephone interviewing.
Jamaica	Inclusion of virtual training, provision of PPE.
Mexico	Elaboration of guidelines to prevent and mitigate COVID-19 during field operations. Re-scheduling of following stages, trying to reduce the delay for results publication. Results publication in two phases, first one in January (short form), second one in March (long form).
Panama	Planning of training in virtual mode; provision of PPE to fieldworkers; development of a publicity campaign to raise awareness of the census activity, considering the change in methodology and biosafety factors.
Puerto Rico	Training adapted to virtual mode; distribution of PPE to all staff; plans altered to minimize in-person contact; redesign of marketing materials; extension of data collection period.
Saint Kitts and Nevis	Several measures are adopted in the workplan including but not limited to: (i) request for support from development partners to defray costs, (ii) smaller in-person group training sessions, (iii) public awareness efforts of the importance of the information, provision of PPE, (iv) training on the effective use of PPE and related covid-19 protocols, and (v) use of wifi-cellular activated tablets for data collection, which reduces the frequency of direct contact between field and office workers.
Saint Lucia	Request additional budget from Donor Partners, increase sensitization campaign, etc.
Saint Vincent and the Grenadines	Provide PPE for field staff.
Venezuela (Bolivarian Republic of)	Online training of field staff, providing personal protective equipment (PPE) for field staff, minimize contact between field-workers and household members, publicity campaign to assure public and adapt the mobility questions to work or study considering the conditions of the quarantine policies applied by the state.

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of United Nations, “Additional measures”, n/d [online] <https://unstats.un.org/unsd/demographic-social/census/COVID-19-SurveyT2-6/>.

Annex A2

Box A2.1

Integration of administrative records and census information in the region

In a meeting convened by the National Institute of Statistics (INE) of Uruguay, the United Nations Population Fund (UNFPA) and the Inter-American Development Bank (IDB) (IDB/UNFPA/INE, 2021), the participating directors and experts from Chile, Colombia and Costa Rica made the following observations:

In Costa Rica, on the issue of including the personal ID number in the census questionnaire, it is considered that both the individual identification civil registry system and the birth and death registers have very good coverage and are of high quality. Hence the need to use the personal ID number to be able to link census data with administrative records, for strictly statistical purposes. This will make it possible to expand the measurement of the socioeconomic characteristics of the population to form a permanent population register and thus avoid the need for costly censuses. It is therefore essential to ascertain the degree to which citizens find it acceptable to provide their personal identification number in the census, given the reservations and prejudices that persist on this matter. To this end, in 2019 the National Institute of Statistics and Census (INEC) conducted a feasibility study and a series of short tests that resulted in 73% of respondents giving their ID number; and 93.3% coincided with the civil registry number. Later, in November 2020, a pilot census was conducted in the canton of El Guarco, where 61.6% of interviewees provided their ID number. According to some analysts, the lower percentage obtained since the pandemic is attributable to the greater reluctance to provide data owing to the situation generated by the Office of the President (*Casa Presidencial*) in setting up the Presidential Data Analysis Unit (UPAD), in which citizens perceived that confidentiality was compromised. The overall conclusion is that the personal ID number is essential for improving and validating the quality of the census, and in forming the basis of a population register, above all guaranteeing the confidentiality of personal information.

In Colombia, inclusion of the identity document in the country's 2018 National Population and Housing Census (CNPV) made it possible to identify the Venezuelan migrant population, which by that time exceeded 980,000 people. Having presented the general content of the census, progress has been made in coverage control through georeferencing and identification. It was possible to obtain a census multidimensional poverty measure at the street block level, which was also linked to the health records available in the country. This will serve as a link with the intercensal count planned for 2023 and the Basic Statistical Register of Population (REBP), on which design work began in 2013. Ninety-three per cent of the population recorded in 2018 gave their identity number, despite the fact that ethnic groups asked for this question not to be included in the forms. The non-response rate among those under 25 years of age was also relatively high, in many cases probably because the suitable respondent did not know or did not remember the identification number of those who were not present in the dwelling at the time of enumeration. Another innovation that made it possible to harness the identification document in the population censuses and in the national statistical system (SEN) was integration with the following: the single database of affiliation to the health system and the database of affiliates to the exceptional regime; the individual records of health service provision (which made it possible to construct a COVID-19 vulnerability index); the single register of victims (to establish compensation measures); the National Quality of Life Survey (ENCV) (which also served as a

post-census survey); and the migration module of the Large-scale Comprehensive Household Survey. Creation of REBP^a has made it possible to draw inferences as to the completeness of census data, using a matching methodology to estimate omitted populations.

In Chile, the baseline is an institutional context in which the National Institute of Statistics (INE), framed by Law No. 17,374, is required to guarantee the statistical secrecy that protects natural and legal persons. This is part of a strategic 2018–2022 project through which the aim is to design and implement an “Integrated System for the use of Administrative Records” with optimal quality standards. Based on several recent census experiences, a mixed digital cartographic update, based on the use of administrative records and field verification, is planned for the 2023 census. Initial experience was gained in the use of the individual ID document in the 2017 census, by asking for the unique national ID number (*Rol Único Nacional* – RUN) from recruited volunteers and from persons who had to enter the Web in the census retrieval stage. This number would then be verified with that held in the Registry and Identification Service (SRCEI). With the aim of incorporating the RUN in the 2023 census forms, INE decided to include it in the census tests to make headway in resolving certain individual omissions of information, such as age and sex. This entails using imputation models, in addition to seeking greater consistency among the respondent sources. Other considerations also need to be taken into account, such as the willingness of the population to provide their identification in a census, since some people still perceive a risk that its content could be used for non-statistical purposes, such as judicial and tax investigations. A pilot test conducted online with public officials between July and August 2020, in a period of pandemic and lockdown, found that some people (direct and indirect respondents, as well as immigrants) would refuse to provide the RUN, owing to a suspicion that the government could use it to make certain decisions that could harm them. The next steps to be taken therefore include making the most of the pilot tests scheduled for May 2021, and the experimental census in April–May 2022. This will verify the non-response rates for the RUN and review the analysis being made at INE on the use of administrative records, since the incorporation of the RUN into the population census has not yet been decided upon.

Uruguay plans to conduct the first fully register-based population census by 2030. Among the reasons for carrying out such a census are its comparative advantages over traditional censuses, such as the lower estimated cost per person (US\$ 0.10 versus US\$ 5.0) and the possibility of having a continuous census each year and being additional dimensions of analysis available. For this purpose, INE would adopt the Scandinavian model, the architecture of which converges basic population, property and corporate or entity registers, which are integrated at the microdata level with identification keys. This system will serve as a reference in the pilot test to be carried out alongside the traditional census scheduled for 2023, where it will also be necessary to ask for the identity card number in the census form. The argument for including this question is that the identity card number could be used to evaluate the coverage and quality of the administrative records, and help to complement the census information and validate its results. In this regard, it is essential to inform the population adequately about the importance of incorporating this document, guaranteeing statistical confidentiality pursuant to Law No. 16,616.

Box A2.1 (concluded)

The United Nations Population Fund (UNFPA) offers a number of thoughts on administrative records in Latin America, arguing that they still need further development and consolidation in legal and communicational aspects, to strengthen national statistical offices and make them credible and trustworthy in the eyes of the population. Above all, this project needs to be given sustainability over time, since it may prove precarious in an unstable political

and economic environment. In conclusion, from an international perspective, the administrative records in this region are not yet mature and solid enough to be able to link them and have blind faith in them. The census provides a unique opportunity to evaluate the quality of the records. Testing the information at the small-area level is fundamental.

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Inter-American Development Bank/United Nations Population Fund/National Institute of Statistics of Uruguay (IDB/UNFPA/INE), “Integración de registros administrativos e información censal: experiencias en la región”, 22 April 2021 [online] <https://www.youtube.com/watch?v=cLFFmuanLJY> [accessed on: 23 August 2021]; National Administrative Department of Statistics (DANE), “Lanzamiento Registro Estadístico Base de Población (REBP)”, 26 de agosto de 2021 [online] <https://www.youtube.com/watch?v=u1OD-AczBug> [accessed on: 7 October 2021]; DANE, “Registro Estadístico Base de Población REBP 2018”, *Informes de Estadística Sociodemográfica Aplicada*, No. 4, 2021 [online] <https://www.dane.gov.co/index.php/estadisticas-por-tema/demografia-y-poblacion/informes-de-estadistica-sociodemografica-aplicada> [fecha de consulta: 7 de octubre de 2021].

^a The Basic Statistical Register of Population (REBP) was presented on 26 August 2021 (DANE, 2021a) and originated with REBP2017, based on seven administrative records. In 2019, REBP served as an input for calculating the omission rate of the 2018 CNPV at the smaller area level. It also motivated the formation of REBP with base year 2018 (REBP2018) “with a periodic annual update that serves as an input for updating the enumeration and basic characterization of the population, its structure and geographic distribution, and also for the development of assumptions on population dynamics that make it possible to update population projections in the intercensal period” (DANE, 2021b, p. 7).

Annex A3

Box A3.1

The 2030 Agenda: towards a paradigm shift in population censuses?

In May 2021, the Southern Common Market (MERCOSUR), collaborated with Argentina's National Institute of Statistics and Census (INDEC) to hold a webinar analysing the prospect of linking registries to censuses. In addition to UNFPA, IDB and Spain's National Institute of Statistics (INE), participants from Latin America included Brazil and Uruguay, which have censuses scheduled for 2022 and 2023, respectively, and Argentina and Paraguay, which have not yet decided on their census year. The main features of the census projects with which these countries will face a new census normality are described below (MERCOSUR/INDEC, 2021).

Having set the scene on methodological and technical progress made in population and housing censuses, and on the use of administrative records in several countries around the world since 2000, UNFPA highlighted the progress achieved in geographic information systems, through the use of high-resolution satellite imagery and GPS coordinates. This has also allowed for new approaches in population estimation models at the grid level (100x100 meters). The Inter-American Development Bank, for its part, in addition to referring to the fundamentals that should always be present in any census (individual enumeration, time-limited, specified timing and periodicity), acknowledges that Latin America needs to adopt new forms of data collection, using administrative records, alternative sources and big data. Other key elements that cannot be ignored include maximum geographical disaggregation and the baseline to design sample frames and make population projections. Spain's INE presents a summary of experience in the transition from the classical census conducted in 2001 to the census based on administrative records in 2021, drawing on 25 years' experience in the census-taking process among all municipalities across the country. Based on these elements, Brazil is not exempt from the aim of modernizing demographic censuses, combining administrative records and

sample surveys. It is also innovating by performing coverage control in the different phases of pre-enumeration, enumeration and post-enumeration. This involves the use of modern satellite location tools, such as WorldPop, which at the same time allows for populations to be estimated in statistical grids based on technological modelling.

Paraguay, which is preparing to conduct its census in 2022, highlights new census paradigms, such as using the digital footprints of buildings (a combination of high-resolution satellite images and algorithmic calculations that make it possible to obtain building polygons); incorporation of the citizenship card number; the start of the inventory of administrative records; and advances in telematic media imposed by the pandemic. Uruguay, which plans to conduct its final traditional census in 2023, is already designing the census for the 2030 round, which will be based on administrative records. This will entail creation of a demographic register, the strengthening of the single geographic address service, the spatial data infrastructure and the Integrated Information System of the Social Area (SIAS), and the execution of a pilot census of administrative records, where the coverage and quality of the variables will be evaluated, identifying the gaps between the traditional census and the records, and incorporating identity card data. Lastly, faced with the situation presented by the pandemic, Argentina is preparing to introduce methodological and technical changes, with the incorporation of a digital housing pre-census and the possibility of self-enumeration through an online questionnaire (e-Census) and a virtual training process on the operational structure. Based on the permanent updating of the Address File of the Argentine Republic (ADRA) and the availability of administrative records, the country seeks to move towards creating a statistical population register that, in conjunction with the set of surveys, will enable geospatial data linkage.

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Common Southern Market/National Institute of Statistics and Census of Argentina (MERCOSUR/INDEC), “Agenda 2030 ¿Hacia un cambio de paradigma de los censos de población?”, 2021 [online] <https://www.youtube.com/watch?v=SLqo4J4j09c> [accessed on: 20 July 2021].

Annex A4

Box A4.1

Use of non-traditional data sources by the region's statistical offices

With the aim of having a presence at the United Nations World Data Forum,^a the Centre for International Strategic Thinking (CEPEI) and the National Administrative Department of Statistics (DANE) of Colombia promoted participation by Latin American and Caribbean countries through a series of webinars, in which the central theme was the use of non-traditional data sources by the region's statistical offices (CEPEI/DANE, 2021).^b

As part of an innovative experience, the big data centre of the Swiss Federal Statistical Office has been recording the activities of the internal working group on big data since 2015, along with data innovation strategies since 2017 and pilot projects since 2019. Initially, the aim was to incorporate new data sources (big data) into the results of surveys and administrative records, with comparability criteria and elements (methodologies, representativeness, persistence and timeliness). As a strategic innovation, in 2017–2020, the main objective was to augment or complement official statistics with non-traditional and more complex statistical methods, such as data science, machine learning or artificial intelligence (AI), relying also on already known primary and secondary data. This highlights the importance of the strategic partnership with the academic sector and the role of the Data Science Competence Centre, which became a centre of excellence of services for the federal administration, through consultancies, methodological support, project implementation and training. In order of priority, data sources would serve the traditional business system (including data produced by public agencies), the Internet of Things and social networks.

Three of the Latin American and Caribbean countries that are interested in participating in the United Nations World Data Forum—Brazil, Colombia and Mexico—took part in the “Road to Bern” webinar, as described below:

In striving towards the Sustainable Development Goals (SDGs) defined in the 2030 Agenda for Sustainable Development, the National Institute of Statistics and Geography (INEGI) of Mexico draws on unstructured information to complement data obtained from traditional sources. These take account of technological advances that enable timely and reliable measurements and data consolidation. In this regard, INEGI highlights the satellite-based Earth observation study in the project of the Working Group on Censuses of the Statistical Conference of the Americas (SCA) of ECLAC for the use of alternative environmental data sources. The study is coordinated by Mexico, which contributes with the Geospatial Data Cube platform. This makes it possible to record images of the earth in three dimensions (x, y, time) and has been used for decision-making on issues such as vegetation, water, soil cover and urban growth, among others. It also performs commands through Python and generates products such as Landsat Geomedian. Other examples of the applications of the Geospatial Data Cube in relation to the Sustainable Development Goals are as follows: are evaluation of public policies with Lake Chapala (SDG 6); (urban growth in the Cancún area (SDG 11); and evaluation of public policies in the Lacandona jungle (SDG 15). This experience could be extended to the rest of the continent through the Digital

Earth of the Americas initiative, as summarized in the document presented to the Conference of European Statisticians (CES).^c This also includes three exercises related to monitoring the mood of Mexican Twitter users on a range of specific days; the experience of points of sale and cell phones to measure the effects of the earthquake of 19 September 2017; and an estimation of the output of industrial firms based on their energy consumption, using econometric models.

The President of the Brazilian Institute of Geography and Statistics (IBGE) referred to Brazil's Regional Centre for Big Data, which aims to contribute to progress in the use of metadata and data science, with a view to improving the production of official statistics, fostering cooperation, knowledge, development and innovation in Latin America and the Caribbean. The centre is based on the IBGE National School of Statistical Sciences (ENCE), founded in 1953, which has vast training and research experience. It works at the undergraduate and graduate levels, and also offers e-learning opportunities. Given the importance of technology for converging data obtained through sample surveys with censuses and their optimization, efforts to hasten the changes brought about by the COVID-19 pandemic (such as remote working, distance learning, the use of web scraping techniques and the management of geospatial imagery) are supported by techniques to convert administrative records into statistical data.

For DANE in Colombia, Switzerland has been fundamental in generating statistical capacities, not only in statistics themselves, but also in terms of geographic information. Acting through that country's State Secretariat for Economic Affairs (SECO), development cooperation has been received to implement the multipurpose cadastre strategy and the economic census project. The United Nations has been developing alternative data sources in response to the challenges of the fourth industrial revolution, with unstructured information that is useful for governments, businesses and civil society. In response, DANE has adopted new mechanisms of data stewardship, technological changes, human resource training and organizational development, incorporating them into the national statistical system. To this end, with support from CEPEI and the “Data for Now” initiative, several projects were launched to address the needs of SDGs related to the following: (i) estimates of multidimensional poverty statistics at the subnational level, based on the 2018 census figures at the street block level in the urban area and on properties in the rural area; and (ii) an exercise on distances between school and home, to measure physical accessibility, as one of the factors driving school dropout.

At the end of the webinar, the ECLAC Statistics Division drew attention to the new structure of the Swiss Federal Statistical Office, which is designed to blend traditional statistics with new data. This is also built into in the new national statistical systems of several of the region's countries. The aim is to strengthen environmental statistics further and integrate the information produced by other government institutions, so that all can respond to public policy needs and thus be able to facilitate decision-making.

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Centre for International Strategic Thinking/National Administrative Department of Statistics of Colombia (CEPEI/DANE), “Webinar de América Latina y el Caribe a Berna: uso de fuentes no tradicionales de datos para las estadísticas oficiales en ALC”, 2021 [online] <https://cepei.org/eventos/fuentes-no-tradicionales-datos-alc/>.

^a To be held in Bern on 3–6 October 2021.

^b Non-traditional data sources include big data, deep learning and machine learning.

^c See [online] <https://documents-dds-ny.un.org/doc/UNDOC/GEN/G19/121/20/PDF/G1912120.pdf?OpenElement/>.

Annex A5

Box A5.1

Workshop on inclusion of the question to obtain the ID card number^a

The Latin American and Caribbean Demographic Centre (CELADE) -Population Division of ECLAC, together with INE of Uruguay and supported by UNFPA, organized a workshop to share experiences, practices and degrees of effectiveness in asking for the personal ID card number, both in the census questionnaire and in the field. The workshop, which was attended by Colombia, Costa Rica and Peru, also considered communication campaigns and other actions to ensure the quality of this information (ECLAC/INE Uruguay, 2021).^b Costa Rica mentioned that complete coverage of birth and death records is an important basis for making the decision to include the question; and, in its case, the evaluations indicate a 1% omission rate in these vital statistics. The inclusion of this question has several purposes, such as linking census data with administrative records for statistical purposes, in order to validate information and improve quality, identify different populations (for example, those with refugee status), broaden the characterization of the population through data that are difficult to capture in censuses, and lay foundations for a population register.

As explained by the National Institute of Statistics and Informatics (INEI) of Peru, the national identity document was validated with the administrative records and the Household Targeting System (SISFOH), the database of the National Registry of Identification and Civil Status, the database of personnel who registered to work as census enumerators, zone or section chiefs, or to perform other tasks, and other surveys that include information on the national ID number. The census and administrative records were linked using the deterministic method (equality) and the probabilistic method (similarity). The results were evaluated through linkage error measurement and bias analysis.

The non-response rate was variable. In Costa Rica it was 23% in the census tests and 37% in the pilot census. In Peru, based on the experimental censuses, it was decided to exclude the alternative "Did not wish to provide information." In the census, 89% gave their national ID card number and 9.5% could not remember it. In the census conducted in Colombia in 2018, 93% of the total census population reported their ID number. In the Large-scale Integrated Household Survey, 88% did so; but the adjustments in data collection methods (by telephone) owing to the COVID-19 pandemic have been pushing up the non-response rate.

The ID card number has been used for the intended purposes through cross-checking with other databases, such as national surveys conducted for various purposes, pension, beneficiary and education systems, and benefits for persons with disability, among others. In Colombia, in addition to cross-checking with external data that makes it possible to improve the quality of variables, the census served to identify duplications, especially between the e-Census and the face-to-face census, given that the respective collection processes were carried out in two different periods (the e-Census was held from January 9 to April 12 and the face-to-face census was conducted between April and October 2018). It is also used to check data obtained from statistical operations against those from available administrative records, in order to start planning for continuous population registers and thus replace periodic censuses with ongoing monitoring of the variables.

In Peru, the database with the largest number of variables was obtained to produce the map of income poverty, chronic malnutrition and stratification. Inclusion of the national ID card in the census made it possible to reach the residents of the housing samples and thus gain access to telephone numbers for interviews during the pandemic. In addition, undercoverage can be estimated by matching with the register of health system affiliates; and with the pensioners register, more detailed diagnostic assessments of this population can be made. Colombia's DANE notes that 25 of 30 administrative records coincide by more than 80% in their identification with the National Registry of Civil Status (RNEC); and the integration of DANE statistical operations with administrative records resulted in the creation of REBP. In addition, thanks to the georeferencing provided by CNPV 2018 and integration with external sources, DANE, the National Planning Department (DNP) and the Analytical Unit of the Institute of Health Technology Assessment (IETS) developed the geo-viewer with the vulnerability index by block.^c This system identifies the population most likely to suffer complications following COVID-19 infection, owing to its demographic characteristics and health status. This facilitates public policy decision-making and helps to target prevention and care actions on the population during the health emergency.

Source: Economic Commission for Latin America and the Caribbean (ECLAC), based on Economic Commission for Latin America and the Caribbean/ National Institute of Statistics of Uruguay (ECLAC/INE), "Workshop 1: June 23, 2021," 2021 [online] https://celade.cepal.org/censosinfo/talleres/virtuales_de_trabajo/2021/#S1.

^a See [online] https://celade.cepal.org/censosinfo/talleres/virtuales_de_trabajo/2021/.

^b Questions to guide the countries' presentation: 1. What and how has the population been told about this question? What arguments were used in the dissemination and communication strategies? 2. Where in the questionnaire was the question placed (characteristics of individuals, at the end) and how did it work? Has it been applied to all household members, with an age filter, or only to the qualified informant? 4. How is data quality controlled? (valid identity cards). Was this done in the field or afterwards? 5. What was the non-response rate? How does the question work when a suitable/qualified informant provides the answers? How is it made operational in the field? Does non-completion of this variable make it possible to continue with the interview or does it block it? 6. Were you able to use this information as planned? Were you able to link the ID card number with any administrative record? Has it been useful for any public institution and for the national statistics institute? 7. What would you say are the key issues to take into account when including the question in the questionnaire? How have you handled these issues? What "crucial" recommendations would you make to countries that are weighing its inclusion in the next census?

^c See [online] <https://geoportal.dane.gov.co/geovisores/sociedad/vulnerabilidad/>.

Annex A6

Box A6.1

Workshop on e-Census and the use of web forms^a

To ascertain the situation in Latin America ahead of the 2020 round, CELADE-ECLAC Population Division and INE of Uruguay dedicated a workshop session to the e-Census. This was attended by Colombia, which conducted its census in 2018; Mexico, which held its census in 2020; and Brazil, which has carried out pilot censuses with a view to implementing this technology at the census level in 2022 (the year to which it had to postpone the 2020 census because of the pandemic). The specific questions posed to the statistical offices of these countries elicited responses that form a basis for rethinking implementation strategies and can also be used as a guide for other countries in the region.^b Internet coverage should be a basic element when deciding to use this resource. According to the International Telecommunication Union (ITU), 72% of the population in Mexico had Internet access in 2020; the equivalent figures being 65% in Colombia in 2018 and 74% in Brazil in 2019 (ITU, 2020). The simple average for the region, stood at 63% around 2019.

The application of web questionnaires has had or will have different objectives in the censuses of the 2020 round in Latin America. In Colombia, web questionnaires were used in the 2018 population and housing census to obtain census information directly. This constituted the initial collection stage, planned for a period of two months. The questionnaires were applied before launching the face-to-face operation, in order to reduce time spent in door-to-door collection. Through an open invitation, anyone could create an account and fill out the census questionnaire, in which the first questions were about georeferencing and updating the geostatistical framework. With this methodology, 12% of the population was covered by the census.

In Mexico, the main modality was the face-to-face interview with mobile data capture devices (MCD), but an invitation to complete the electronic questionnaire was given in three situations: (i) at the respondent's request; (ii) when after three visits the respondent had not been found; and (iii) in areas of restricted access. Similarly, when the interview was incomplete, a letter was delivered to the respondent inviting him/her to self-enumerate or respond with telephone assistance. If the respondent did not answer online, the interviewer or his/her supervisor visited the dwelling again to complete the interview. The electronic questionnaire captured 0.1% of the data.

In Brazil, there are plans to return to the 2010 modality, collecting data online from households that request this method, or from those who refuse the face-to-face or telephone interview, and in dwellings whose occupants are absent at the time of data collection in the area.

Adaptation of the questions to the electronic questionnaire format

As mentioned by Colombia, technology makes it necessary to modify the wording of some questions because, when responding online, the person does not rely on information provided in a direct interview. For example, the web questionnaire does not contain the question on the occupancy status of the dwelling; but, later, in the database, reference is made to "dwellings with occupants present". The concept of habitual resident was highlighted because the electronic questionnaire could be completed from anywhere in the world, and the respondent had to be very clear about who should be included as members of their household and refer to their place of residence in Colombia. Operational control questions were excluded, such as: operational coordination area and operational area, coverage unit, building order number, use of the dwelling. It was emphasized that the address of the dwelling to be registered should be that of their habitual residence. The phrasing was adapted, for example, by referring to "Walls of the dwelling in which you reside". In the "Place of birth" question, the option "In this municipality" was replaced by "In the municipality of habitual residence" for the electronic questionnaire. Apart from these modifications, the questions were the same in all data collection modalities.

As Mexico applied a basic form to the entire population and an expanded form to a sample, the electronic questionnaire used the basic form.^c This means that for those who completed the census

using an electronic questionnaire, no information was collected on housing characteristics (16 questions), characteristics of persons (27), international migration (13), other monetary income (4) and food (3). The wording of questions about place of residence and place of birth had to be adjusted, by eliminating the option "Here". In Brazil, the same form will be used in all modalities, the only difference being that the electronic questionnaire will include a help function for each question.

Quality problems of the electronic questionnaire compared to other data capture methods

Although Colombia does not provide details on quality or coverage problems (such as a higher omission rate among individuals or households, biases or incomplete questionnaires), it does mention various circumstances that may have affected the quality of the electronic questionnaire, such as people's limited technological skills for filling out questionnaires in this format, fear of using these and other technological tools, and connectivity problems. It also notes the methodological change introduced by DANE with respect to the population living in military barracks. In this case an agreement was signed with the military to allow the residents of such institutions to complete the electronic questionnaire by registering as members of the private household from which they originate. The National Committee of Experts (CNE) that conducted the evaluation of the census considered that the inclusion of members of the Armed Forces in private households, even when they do not live there, stands in contrast with previous censuses (where they were included in their barracks) and thus contravenes the concepts of habitual resident and household (CNE, 2019).

In Mexico, at the time of preparing this report, the potential biases and quality of the data collected online had not been analysed. Tests conducted in Brazil detected the omission of persons in the dwellings and the existence of incomplete forms; so special attention will be paid to these issues in the census itself.

Strategies to improve the response rate

Since this is a new methodology, the population needs to be made aware of its importance and be shown how to proceed, as a basis for improving the quality of the data collected. In Colombia, people were told that if they filled out the electronic questionnaire they did not have to respond to the census in person, and that they could print the certificate and place it in a visible location or leave it at the entry door of residential complexes. The work of the departmental coordinators included visiting public entities to give instructions on the electronic questionnaire. As a motivation and learning strategy, from the pre-census stage, invitations were issued to fill out the electronic questionnaire in real time and generate the census certificate.

In Mexico, the various tests carried out showed that it was infeasible to start with the census in electronic format, because an analysis of other citizen duties that could be discharged online (such as the income tax return) revealed that not everyone carried out the procedures through this channel. This suggested that the response would not be sufficient to replace the data collection method. Three types of platform were implemented: face-to-face with MCD (98%); using the MCD or paper environment; electronic questionnaire for those requesting it, and subsequently a letter was delivered to certain households, through the Mexican postal service, inviting them to answer the electronic questionnaire. The country did not adhere to a single strategy, but adapted to each situation.

In the 2019 pilot census in Brazil, a two-stage data collection strategy was proposed: (i) exclusively online; and (ii) combined (online and face-to-face). In the first phase, letters were sent to all households in the cadastre, inviting them to complete the electronic questionnaire. However, the acceptance rate was just 4.5%, indicating that the response rate is low for the time being.

Box A6.1 (concluded)**In which cases was this survey strategy applied?**

As noted above, in Colombia this strategy was proposed as a way to collect data directly over a three-month period, using this modality exclusively. Completing the electronic questionnaire was mandatory for public employees. In Brazil, it was optional during the first visit and was used as a “rescue” if no contact was made with the household or if a face-to-face interview could not be arranged. In Mexico, the invitation was delivered in three situations: at the respondent’s request, when the respondent was not found after the third visit, and in areas of restricted access. The face-to-face interview was the primary method, which always involved an initial contact; only in cases where the respondent was not found was the letter inviting self-enumeration left at the respondent’s home address.

Integration of methodologies

In Colombia, once data collection through the electronic questionnaire had been completed, the fieldwork began with face-to-face interviews. The MCD and paper questionnaire included a question to filter out households that had already completed the census online. As noted by the National Committee of Experts (CNE), households that had completed the electronic questionnaire were questioned about new developments that had occurred in the household between the electronic census and the census enumerator’s visit. However, the mechanism for reconciling the two pieces of data was not clearly defined; and with such a long time gap between one data collection and the other, changes in households were likely to be frequent.^d In Mexico, if the interview was incomplete, the respondent was given a letter inviting him/her to answer by self-enumeration or with telephone assistance, at which time all the information was requested again. If the respondent did not answer online, the interviewer or his/her supervisor would visit the dwelling again to complete the whole interview. Brazil does not have facilities for integrating the two collection methods, which are considered independent.

Dealing with the possibility that more than one household lives in the dwelling

Colombia’s presentation does not explain how other households were identified in the dwelling, or whether the group of persons for whom the questionnaire was being completed comprised two households according to the census definition. It is noted that the electronic questionnaire does not include the order number of the household within the dwelling, given that it was not required, since the questionnaire was completed by each household and did not

depend on a tour of the dwelling. Difficulties were also noted in terms of adding persons and modifying the relationship when the head of household was not recorded as the first person, or in editing information to make corrections. In Mexico, there were no problems with the household concept because it was not included in the census. In Brazil in 2010, another methodology and an algorithm based on two questions was used to identify the family unit in multi-family households (the household as such is not investigated). Therefore, the fact that the person completing the form does not understand is not a problem. The questions that posed problems in the online questionnaire are the same as are difficult in the face-to-face census.

Recommendations for future censuses

Based on the 2018 experience, Colombia considers that it is necessary to: (i) test the capacity of the technological infrastructure to avoid having the platform collapse when faced with a massive influx of users; (ii) undertake a broad awareness-raising process on the electronic census, including data security; (iii) set up a user help centre to resolve doubts and clarify instructions for completing the census; (iv) in the application, include help and guidance for completing the information (user manual for filling out the form, audiovisual aids). In some cases, the “obligation” on public servants to complete the electronic questionnaire led to its being completed individually, without including other household members. The different collection methods (electronic, paper and MCD questionnaires) need to be tested in the same household, for the purpose of comparing the results and determining the effect of the instrument on the observation unit. When implementing an electronic census, a balance needs to be struck between the security established for creating accounts and the usability of the tool for the interviewed user.

Mexico highlighted the importance of systemizing the entire self-enumeration process and defining a testing plan (systems, volume, ethical hacking, coverage). In relation to technology, consideration needs to be given to the development of software applications, information and communications technology (ICT) infrastructure and the coverage of Internet services. A record also needs to be kept of households that respond online. Lastly, a communication campaign should be implemented to explain the census reference time and issues that respondents should take into account when providing their information.

Brazil considers it advisable to do many tests, provide a user-friendly interface and invest in the design of the questionnaire, with illustrations and complementary texts.

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of International Communication Union (ITU), “Statistics”, 2020 [online] <https://www.itu.int/en/ITU-D/Statistics/Pages/stat/default.aspx> [accessed on: 16 September 2021]; Comité Nacional de Expertos (CNE), *Informe: Comité Nacional de Expertos para la Evaluación del Censo Nacional de Población y Vivienda de Colombia 2018*, 12 July [online] <https://www.dane.gov.co/files/censo2018/informacion-tecnica/CNPV-2018-informe-comite-expertos-nacional.pdf>.

^a See [online] https://celade.cepal.org/censosinfo/talleres/virtuales_de_trabajo/2021/.

^b The list of questions for the countries was as follows: 1. Was the number and format of the questions in the e-Census the same as in the MCD or other data capture system? Which questions, topics or categories were eliminated? Which questions, topics or categories were modified? 2. What were the main quality problems you encountered with the e-Census compared to other data capture methods? Consider, for example, if you had a greater omission of individuals within the dwellings, omission of households, biases in any response category, incomplete forms, among other relevant aspects. 3. What strategies did you study and apply to improve the response intention through the e-Census? Did you attain the achievement rate proposed for the e-Census? 4. In which cases was this survey strategy applied (optional on first visit, “rescue” strategy in the event of no contact)? Does the strategy always involve initial contact with the census taker, or is a code sent to access the web questionnaire, with no initial contact? 5. Was any integration between data capture methods implemented (e.g. if you start with MCD, can you continue with another method such as the web questionnaire)? 6. How did you deal with the existence of more than one household per dwelling? Is the e-Census access code attributed per household or per dwelling? 7. What “crucial” recommendations would you make to countries that are weighing the use of the e-Census in the next census? “Note: For countries that are still in the preparatory phase, share your experience gained from the tests carried out, describing the methodological aspects and the test results” [see [online] https://celade.cepal.org/censosinfo/talleres/virtuales_de_trabajo/2021/1%20CELADE-INE_notaconceptual_WEB_LGTBL_DNI%20050721.pdf].

^c The expanded form contained all of the questions of the basic form and added others to investigate specific topics in greater depth.

^d The report of the National Committee of Experts mentions that the household had to indicate the code it had received. If this code was not available, the enumerator verified with the residents’ ID numbers whether the household was already included in the database. In this case, “if the household had completed the e-Census, the interviewer only had to ask for any new information between the completion of the e-Census and the on-site visit. No questions were asked about whether all persons in the household had been reported in the e-Census in order to confirm that no household members had been omitted; that is, that all members of the household had indeed been listed in the e-Census. The novelties to be included were: births, arrival/departure of new members, death of household members. The most frequent novelty was the omission of individuals, especially among civil servants who were initially listed as single-person households. In the event of new developments, the enumerator informed the supervisor so that the electronic questionnaire could be reactivated to let the household make adjustments; and this was monitored until the closure of the census. The inclusion of new items implies a change in household composition, especially in the case of births and deaths. This means that the household is recorded as at the time of the on-site visit or of the adjustments, which may even have affected the structure of the household” (CNE, 2019, p. 23).

Annex A7

Box A7.1

Workshop on inclusion of sexual orientation and gender identity questions^a

As Latin America is not exempt from this debate, in 2021 CELADE-Population Division of ECLAC and INE of Uruguay organized a workshop on the inclusion of questions about sexual orientation and gender identity. The aim was to learn from the experience of three countries that have explored the possibility of introducing questions of this type in the population and housing census of the 2020 round. One of them is Colombia, which decided not to ask these questions in the 2018 CNPV; the other two are Argentina and Chile, which are in the process of conducting the necessary tests, with a view to making the decision for the next census. The organizers wanted to know if any government agency, civil society organization or other entity had asked the statistical office to include these questions, and to gather information on whether civil society and other institutions had participated in the process, or the pilot tests and methodological work undertaken, and in the final decisions on this issue (ECLAC/INE, 2021).^b

Demand for sexual orientation and gender identity questions to be included

In the process of defining the content of the census questionnaire, INE of Chile conducted a needs detection exercise. This involved organizing roundtables comprising INE technicians and resulted in an institutional proposal. Subsequently, the process was opened up for participation by ministries and other government institutions, civil society organizations, indigenous and tribal peoples, and persons of African descent. The main reasons for including questions in the censuses on gender identity, sexual orientation and sex at birth are the fact that, gay, bisexual, transgender, intersexual and queer (LGBTIQ+) people are otherwise rendered invisible, and they are subject to discrimination, violence and social and cultural disadvantages. In addition, the rights-based approach is a basis for statistical visibility; and tools are needed to design and implement informed public policies. The inclusion of such questions also recognizes observance of the friendly settlement agreements signed between the Homosexual Integration and Liberation Movement (Movilh) and the Government, as well as the anti-discrimination and gender identity laws.

In Argentina, the National Directorate of Integrated Sexual and Gender Diversity Policies of the Ministry of Women, Genders and Diversity asked INDEC to generate statistical information about the trans population for the purpose of formulating public policies aligned to their realities. The aforementioned ministry asked for the question on gender identity to be included in the 2020 census round. This is justified by the need to make visible and recognize the living conditions of the trans population; provide an input for the design, implementation and evaluation of public policies; and produce gender sensitive statistics. Because of its size, this population is very hard to capture in household surveys; and administrative records do not include its measurement or else do so in a very heterogeneous way. The pilot tests that have been carried out have yielded satisfactory results. Invitations were extended to provincial and national government agencies and civil society organizations to participate as observers (not as participants) in the pilot tests, and also in meetings to discuss the conceptual definition and categories of gender identity and sexual orientation.

Questions proposed, universe of application and qualified respondent

Based on both experience and theory, in Chile it is known that a direct respondent and a self-administered instrument should be used for these purposes; but the INE reality in the censuses is that there is a suitable respondent and a face-to-face instrument. In the tests, the face-to-face questionnaire was applied, and a survey interaction was carried out along with a cognitive survey (formulation of questions and spontaneous and reactive surveys).

In Argentina, the first pilot test conducted in 2019 asked the following: "According to sex at birth, was [name of person] ___ : male?, female?, intersex?"; and "According to gender identity, does ___ consider him/herself: man, woman, trans man, trans woman, transvestite, other?" Persons aged 14 years and older were asked: "According to sexual orientation does ___ consider him/herself: lesbian, gay, bisexual, heterosexual, other sexual orientation. Which?." The second pilot test was applied to the entire population and asked, "What is the sex of ___: female, male?" and "According to gender identity, does ___ consider him/herself: man, woman, trans woman, trans man, other, unknown." The questions were posed in the questionnaire successively. Three trans women were identified among 11,765 persons covered. In the experimental census, the universe of application was the population over 14 years of age. Question 2 was: "Is ___: female, male?" and question 24 was: "According to gender identity does ___ consider him/herself: man, woman, trans man, trans woman, transvestite, other, unknown?" That is to say, in this pilot census the questions were placed in different sections.

In Colombia, the Jamundí experimental census was carried out with two versions of the questionnaire, using different numbers of questions and different wording, together with external coding aids.^c The aim was to test the relevance of the additional aids in some questions (support tables). In the chapter on individuals, question 45 was: "Is ___ male, female or intersexual?"; question 87 was: "Does ___ recognize him/herself in his/her sexual orientation as: heterosexual? homosexual? bisexual? don't know, NR"; and question 88 was: "Does ___ recognize him/herself in his/her gender identity as: male?, female?, transgender (transvestite, transformist, transsexual)?, intergender?, don't know, NR".

Results of pilot or experimental tests and censuses

In Argentina, the gender identity question was well accepted in different areas of the country and across social sectors; and it worked well.

In the Jamundí pilot census in Colombia, the questions on sexual orientation and gender identity, as well as the "intersexual" option in the sex question, posed major difficulties. The quality of the data was compromised by the lack of responses from direct respondents, compounded by the discomfort of the interview when there were other people in the household.

Were there any explicit pressures or movements that opposed or oppose their inclusion?

In the case of Argentina, INDEC reports that it did not feel any pressure to exclude these questions; the slogan "*Reconocernos*" (Recognizing ourselves) accompanies the objectives of the 2022

Box A7.1 (concluded)

census operation. In Colombia however, the indigenous population of the Permanent Roundtable for Consultation with Indigenous Peoples and Organizations asked for questions on sexual orientation and gender identity to be excluded for cultural reasons.

Communication strategies if these questions are included in the census

According to INE of Chile, inclusion of these variables needs to be supported by an education campaign on gender identity and the LGBT community, to prevent the respective groups from being underrepresented. It is also necessary to strengthen training for census takers and enumerators on these issues.

Reasons for not including these questions in the final census

In the 2018 CNPV, Colombia did not include the “intersexual” category in the wording of the question on sex. Given the discomfort produced by reading the question containing this term, census takers selected the alternative without asking. In the sexual orientation and gender identity questions (questions 87 and 88 of the Jamundí pilot census, 2016) it was necessary to explain the concepts; sometimes the term “normal” was used to refer to “heterosexual”, both by the census taker and by the respondent. These questions generate discomfort, particularly when asked in front of other people. The quality of the data is seriously compromised in the absence of direct respondent answers.

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of Economic Commission for Latin America and the Caribbean/ National Institute of Statistics (INE) of Uruguay (ECLAC/INE) “Taller 3: 7 de julio de 2021” [online] https://celade.cepal.org/censosinfo/talleres/virtuales_de_trabajo/2021/#S3.

^a See [online] https://celade.cepal.org/censosinfo/talleres/virtuales_de_trabajo/2021/.

^b 1. Did you receive demands from civil society organizations for these questions to be included? Did you develop any participatory or consultation mechanism with the stakeholder organizations?

2. What were/are the proposed questions? Describe the universe of application and location within the census ballot. Do you consider the answers given by qualified respondents? 3. Did you succeed in testing the question(s) in cognitive tests, pilots or experimental censuses? What were the results and main conclusions? 4. Were there any explicit pressures or movements from conservative or other groups that opposed or oppose their inclusion? 5. If included in the census, what communication strategies will you implement? 6. If applicable, what were the reasons for ultimately not including them in the census? 7. What “crucial” recommendations would you make to countries that are weighing the inclusion of these questions in the next census?

^c The presentation does not include the results per questionnaire.

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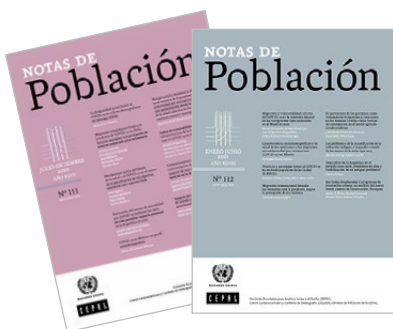
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