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Use of Administrative Registers in Population and Housing Censuses

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Use of administrative registers in population and housing censuses

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Introduction

The present study sets out the methodology for using administrative registers when conducting population and household censuses. Administrative registers are available from government bodies and enterprises, and should be used as a reliable source of census data. These are either core registers, such as the central population registry, building and housing registers and statistical business registers, or complementary, such as student registers, tax registers and property registers, among others whose data are linked to the central population registry. Linking data from registers allows for the establishment of a comprehensive database from various sources for use in censuses, to make such information to the public. Several countries, including Austria, Denmark, Finland, the Netherlands, Norway and Sweden, have succeeded in conducting censuses using only administrative registers, without the need for paper or electronic surveys; while others, such as Bahrain, Poland, Qatar and Turkey, have combined administrative registers and household surveys to conduct successful population censuses.

Experiences have shown that using administrative registers only, or combining them with other data sources, saves time and money compared with traditional censuses, allowing for population and household censuses to be conducted every five years and for the monthly, quarterly and annual publication of data for other purposes.

Several statistical offices in Arab countries are considering using administrative registers in preparation for the 2020 census round, by cooperating with the relevant administrative bodies to develop reliable statistical registers as data sources for censuses and other statistical projects.

I. CENTRAL POPULATION REGISTRY

A. DEFINITION

Bodies that monitor the population and manage data differ between countries. In Norway, for example, specialized bodies carry out this task, but in many Arab countries it is the responsibility of interior ministries. Citizens must submit their personal data to the central population registry to exercise their civil rights, such as residency, property and voting rights, and to benefit from government assistance. The law specifies the conditions for registering eligible individuals in the population registry within a given geographical area, so as to establish their identity and civic status and register their personal details and permanent address.

The population registry provides legal documentation and evidence to protect the civil rights of registrants, and enables the Government to plan its services. The registry includes detailed data on each person, such as identity and place of residence. It is therefore a primary source of demographic and social data that can be relied on when conducting population, household and establishment censuses.

The registry comprises data on the following groups:

- Citizens;
- Foreign residents with residency permits;
- Citizens living abroad;
- Undocumented residents;
- Visitors and transit passengers.

B. COMPONENTS

Components of the central population registry differ according to a country's needs. Scandinavian countries, which are considered pioneers in this field, have similar components. The present paper sets out in detail the components of the Norwegian Population Register, whereby residents are given a personal identification (ID) number composed of 11 digits for use in all official processes. Economic migrants who are

in the country for less than six months are given a D number. Table 1 presents the various components of the Norwegian central population registry.

TABLE 1. COMPONENTS OF THE NORWEGIAN POPULATION REGISTER

Number of digits	Definition
11	Personal identification number
4	Municipal code where individual permanently resides
26	Full name
30	Full address (name of street, road etc.)
2	Postal code
1	Code for type of registration (resident, deceased, emigrated, etc.)
1	Code for marital status
6	Date of death
11	Identification number for mother (only for individuals born after 30 September 1964)
11	Identification number for father (only for individuals born after 30 September 1964)
103	Total digits

Source: Norwegian Population Register System.

C. PERSONAL IDENTIFICATION NUMBER

Personal identification numbers in Norway are composed of 11 digits, divided into three sections. The first section is composed of six digits showing a person's date of birth (day, month, year). The second contains a three-digit personal serial number. The third has two digits know as personal check-digits: the first digit is calculated using a selected set of weights and the second using IBM standard weights.

In Sweden, the tax agency provides personal identity numbers to individuals registered in the population registry, which contains information on an individual's full name, address, age, sex, marital status, birthplace, nationality (for migrants), and spouse and offspring data where applicable. An identity number is composed of 10 digits: six digits for day, month a year of birth; a three-digit serial number; and one check-digit. Below is an example of this where an individual's date of birth is 23 08 64, followed by a three-digit serial number (323) and one check-digit (4). The serial number can range between 001 and 999, noting that those ending with an odd number are for men and with an even number are for women. No two people can have the same date of birth and serial number.

Personal identity number in Sweden

Year of birth	Month of birth	Day of birth		Serial number	Check-digit
64	08	23	-	323	4

6 4 0 8 2 3 - 3 2 3
2 1 2 1 2 1 - 2 1 2

1 + 2 + 4 + 0 + 8 + 4 + 3 + 6 + 2 + 6 = 36

10 – 6 = 4

Source: www.skatteverket.se.

D. USES

Central population registries have many uses, such as estimating population growth over a set period, preparing for traditional population and household censuses, evaluating census results, developing monitoring frameworks used in household censuses, generating data on internal and international migration through address changes, and registering arrivals and departures via international borders. Some countries, such as Austria, Finland, the Netherlands and Sweden, are currently relying exclusively on these registers when conducting censuses every five years. Population registries are key independent data sources that can be compared with data from traditional censuses. Many countries depend on population registries when preparing electoral roles, among others.

II. BUILDING AND HOUSING REGISTERS

Data from building and housing registers are used for conducting surveys and research on the housing conditions of individuals and families. They contain important variables that can be linked to changes in the central population registry through a person's identification number. Several countries have compiled building and housing registers, stored in electronic databases that can be referred to when providing numerous services including facilitating access to residents. These registers have been used recently in population and household censuses in several Scandinavian countries, linking persons' identification numbers and addresses to building and housing registers so as to gather population distribution data categorized by administrative department and housing characteristics. Table 2 presents the components of building and housing registers in Finland.

TABLE 2. COMPONENTS OF BUILDING AND HOUSING REGISTERS IN FINLAND

Municipality (3 digits)	091	Building code (18 digits)
City/village (3 digits)	602	
Plot (4 digits)	0042	
Property (4 digits)	0003	
Check-digit (one box)	K	
Building number (3 digits)	001	
Entrance (one box)	A	Housing unit code (5 digits)
Flat number (3 digits)	003	
Apartment code (one box)	B	
Total		23 digits

Source: Statistics of Finland: Administrative sources of population and housing censuses, 2007.

III. STATISTICAL BUSINESS REGISTERS

A statistical business register comprises a central database containing a list of institutions and enterprises in a country or geographical area, which is updated by a body responsible for official statistics. This register plays a central role in generating economic statistics. In the past, its use was limited to assisting statistical bodies in monitoring the compilation of samples from economic surveys. Today, however, it is used as the following:

- A tool to ensure the comprehensiveness of economic statistics
- A simple method for determining the components of economic activity
- A data source for national accounts.

The business register can be linked to other administrative registers, such as the central population registry, using identification numbers given to all establishments conducting economic activities, thus facilitating the identification of a person's economic activity. The business register also strengthens the

coordination of various statistical outputs, promotes statistics generation, and meets increasing demands for disaggregated economic statistics.

STATISTICAL BUSINESS REGISTER VARIABLES

1. *Metadata*

(a) Identification number of an institution/establishment;
(b) Statistical identification number;
(c) Postal address;
(d) Geographic and spatial distribution codes;
(e) Telephone number;
(f) Fax number.

2. *Classification*

(a) Classification code for an economic activity;
(b) Legal form;
(c) Sector;
(d) Ownership.

3. *Size of institution/establishment*

(a) Number of employees;
(b) Turnover;
(c) Property value.

4. *Variables*

(a) Dates of activity;
(b) Date of activity end;
(c) Date of sudden stop in activity;
(d) Date of activity renewal.

IV. DEFINITION OF POPULATION AND HOUSEHOLD CENSUSES

The United Nations, in revision 2 of "Principles and recommendations for population and housing censuses" of 2009, defines a population census as the total process of collecting, compiling, evaluating, analysing and publishing or otherwise disseminating demographic, economic and social data pertaining, at a specified time, to all persons in a country or in a well-delimited part of a country. Population censuses and population registration are two different processes undertaken by separate bodies for differing reasons. Censuses are conducted by central statistical offices every 10 years at least, while some countries, such as Australia, Canada and New Zealand, carry them out every 5 years. Censuses give a snapshot of a country's status, including information on population size, social and demographic characteristics, economic activity, housing conditions and family composition, in addition to other data on technology use, for example. The population registry, however, is a source of personal data that is updated daily, including birth, death, marriage and divorce entries. It is therefore dynamic and up-to-date, in contrast to a census whose results are associated to a given period specified upon its launch.

A 2013 United Nations survey on the use of methodologies in conducting the 2010 round of censuses, carried out in 123 countries, shows that 105 countries (85 per cent) conducted their censuses using traditional methods. Only 12 countries (10 per cent) conducted censuses using administrative registers, and six countries (5 per cent) used other methods. Regional variations were noted in census methods across the world. Countries in North America, Africa and Oceania used only traditional methods, while 78 per cent of Asian countries used

these methods and 7 per cent referred to administrative registers. In Europe, 61 per cent of countries employed traditional methods, while 28 per cent relied on administrative registers.

V. POPULATION AND HOUSING CENSUSES BASED ON ADMINISTRATIVE REGISTERS

It is possible to conduct a population and housing census by referring to administrative registers, such as the central population registry, building and housing registers, the statistical business register and other registers including employment, education and tax logs. Scandinavian countries use administrative registers when conducting censuses; other countries are considering adopting the same method for the 2020 census round.

A. CONDITIONS

The following conditions must be fulfilled when conducting censuses based on administrative registers:

(a) Enact laws that allow statistical offices periodic access to administrative registers, such as the population registry and building and housing registers. Statistical offices may sign memorandums of understanding with relevant ministries and government departments to receive required data;

(b) Raise individuals' awareness on the uses of administrative registers to receive authorization to access personal data for statistical purposes;

(c) Include personal identification numbers in administrative registers to facilitate linking data, such as information on employment, education, health care, housing conditions, and technology and social media use;

(d) Establish developed infrastructure for administrative record systems to meet administrative and statistical needs, stressing the necessity of continually updating information and ensuring data accuracy;

(e) Encourage people to update their data in administrative registers regularly and accurately, including their address, given their importance to determining population distribution, and daily, monthly and annual births and deaths, and enterprises' economic activities especially the date work began, closing date or change in economic activity.

B. CHARACTERISTICS

The following are key characteristics of censuses based on administrative registers:

(a) Possibility of conducting individual enumeration, ensuring universality within a defined territory, simultaneity and defined periodicity, and producing statistical data for small areas and subgroups. These are the main features of traditional censuses, in accordance with the second and third revisions of "Principles and recommendations for population and housing censuses";

(b) Possibility of providing current data on the population over a given period. This is also a characteristic of traditional censuses;

(c) More affordable than traditional censuses;

(d) Possibility of disseminating data in a relatively short period (several months), compared to traditional censuses that are conducted once every five or ten years;

(e) Eliminate the need for field visits to households to fill questionnaires or conduct personal interviews to gather data;

(f) Possibility of distributing financial resources allocated for censuses over several years, thus enabling their use to improve data quality or establish a statistical business register;

(g) Possibility of using administrative registers to conduct household surveys known as longitudinal surveys.

C. CHALLENGES

(a) Censuses based on administrative registers cover only variables included in those registers. Household surveys are therefore needed to gather all necessary data;

(b) Statistically, some concepts used in administrative registers might be inconsistent with those used internationally, such as the concepts of unemployment and labour as defined by the International Labour Organization;

(c) Using data from administrative registers could raise inconsistency issues;

(d) Censuses based on administrative registers are affected by legal amendments in administrative processes;

(e) Establishing an enabling environment for censuses requires an extended period (years or decades), but it is a useful process that statistical offices should invest in. Negotiations with custodians of administrative registers could be lengthy to ensure timely access to data, because these registers were originally prepared for relevant ministries and departments rather than statistical purposes.

D. SOME VARIABLES

(a) Marital status: such data should be available from the central population registry, given that it is the main demographic registry for marriages and other events;

(b) Employment and retirement: such data can be retrieved from social security registers, tax registers, military and reserve personnel registers, unemployment registers and welfare registers. Social security registers can also be consulted for data on persons outside the labour force who receive household benefits or health insurance;

(c) Students: student registers show data on students, enrolment in schools and universities, field of study and geographic location.

Registers of the following might not be available:

(i) Employment type;
(ii) Transport methods used by individuals;
(iii) Time spent travelling to work or school;
(iv) Languages spoken by individuals;
(v) Religion;
(vi) Disability.

Providing such data is not compulsory, as stated by the United Nations, except employment type and disability that are considered key indicators in censuses.

E. EVALUATING DATA QUALITY

Administrative registers are no longer simply statistical frameworks used to measure the universality of census data or household surveys. They have become a key source of statistical data, especially for censuses based on administrative registers. However, these registers should be revised before using them in censuses. The following two perspectives must be taken into account when evaluating administrative registers:

(a) Users of census data who are interested in the quality of the final product;

(b) Data producers who are interested in the quality of statistical entries, and the method used for processing and preparing data for users.

Administrative registers can be used in the following two situations:

(a) If population registers are good quality, they can be used as a data source without prior amendments;

(b) If administrative registers need amending, other registers or surveys can be used such as labour force surveys.

The following is an example of data quality evaluation for an Austrian census.

In Austria, censuses based on administrative registers replaced traditional census in 2011. These new censuses have several characteristics, notably they are less costly and limit visits to households. However, they do raise some challenges, including data quality evaluation. Consequently, the Austrian statistical office developed a normative framework to evaluate the quality of data in administrative registers, which relies on the following seven key registries that constitute the backbone of a census:

(a) Central population registry;
(b) Educational attainment registers;
(c) Central social security register;
(d) Dwelling and housing registers;
(e) Tax registers;
(f) Unemployment registers;
(g) Record of establishments.

These registers are used to determine population size, the number of buildings and housing units, and the number of enterprises and establishments and their sub-units. These seven registries are supported by the following eight complementary registers used to compare between data from censuses and other sources to check their accuracy:

(a) Demographic register (births, deaths, marriage, divorce, emigration);
(b) Education registers (registers from primary schools, universities and institutes);
(c) Family registers (father, mother, children);
(d) Housing analyses;
(e) Transport analyses;
(f) Employment status analyses;
(g) Enterprises.

VI. ADMINISTRATIVE REGISTERS

The process of organizing data from administrative registers is divided into the following three stages: the preparatory stage when individual data is stored; the data linking stage at the individual level via personal identification numbers; and establishing a multidimensional database. Subsequently, data analysis blocks can be built to facilitate data selection by users, including blocks on demography, education, family status, housing

and employment. These data can be presented through various geographic perspectives and levels and administrative distributions.

A. USING ADMINISTRATIVE REGISTERS IN TRADITIONAL CENSUSES

Experiences have revealed the need to use administrative registers during some stages of traditional censuses, such as the preparatory, data collection and outcome evaluation stages. The following is an example of using some components of administrative registers for conducting a traditional census in Canada.

(a) Registers of addresses from the 2006 census in preparation for the 2011 census;

(b) Tax registers, after receiving authorization from stakeholders, to limit personal questions and improve income data quality;

(c) Statistical business register to codify economic activities in longitudinal surveys;

(d) Building and housing registers to provide data on shared housing without the need to conduct personal interviews.

Using administrative registers in traditional censuses contributes to evaluating data quality before dissemination, to determining and monitoring respondent groups, and to assessing universality.

B. USING ADMINISTRATIVE REGISTERS FOR CONDUCTING UNIFIED POPULATION CENSUSES

Several countries have conducted population and housing censuses using administrative registers and household surveys in addition to other methods such as Internet enumeration, and telephone or computer-based personal interviews. Data from various sources are linked using personal identification numbers after registers are revised. To identify building and housing units, digital maps on a geospatial positioning system are used instead of the traditional head counting method or reference is made to building and housing registers, if they exist.

Poland has implemented a successful method for conducting censuses by blending data from administrative registers and those from other sources using modern technology. The census drew data from 28 sources. Several regional centres have conducted censuses using geographic information systems, thus reducing field workers from 170,000 in the 2002 census to 18,000 in the 2011 census and decreasing the cost of the census by 50 million euros.

In view of the success of the Polish experiment, the following four sources of data were identified:

(a) Administrative registers;
(b) Internet (self-enumeration);
(c) Telephone interviews;
(d) Computer-based interviews.

The following sources for administrative registers were also determined:

(a) Ministry of the Interior;
(b) Finance Ministry;
(c) Ministry of Justice;
(d) Agricultural Social Insurance Fund;
(e) National Health Fund;
(f) Agency for Restructuring and Modernisation of Agriculture;
(g) Geodesy and Cartography Agency;
(h) Agriculture and Food Inspection Agency;

(i) State Fund for Rehabilitation of Disabled Persons;
(j) Administrative divisions;
(k) Municipal offices;
(l) Telecommunications companies;
(m) Energy providers;
(n) Offices for registering foreigners;
(o) Social security institutions;
(p) Housing institutions.

The Polish experience proved that using data from administrative registers in censuses requires detailed analysis to ensure accuracy and identify related data and variables. Results were checked against existing definitions and classifications, and registers and registers were prepared for this process.

Regarding the three last census sources, electronic questionnaires were used to gather data. Concerning administrative registers, data were taken either directly from surveys or from other sources so as to identify certain standards in the census, such as sampling frameworks for housing units. These sources were used to make various estimates, calculate non-responsiveness rates and conduct comparisons to determine data quality.

C. FROM ADMINISTRATIVE TO STATISTICAL REGISTERS

Government ministries and departments compile administrative registers for administrative purposes, such as organizing services, and store them electronically for consultation and update. Statistical offices can access these registers for statistical purposes through partnerships with record custodians. It is necessary to analyse registers before use to identify concepts and definitions therein, and determine indicators and time references. Registers must go through the following processing phases before transfer to statistical registers used in censuses:

(a) Data revision;
(b) Processing data lacking some variables;
(c) Linking and comparing between variables via personal identification numbers;
(d) Determining time references;
(e) Developing new variables;
(f) Applying quality-assurance standards;
(g) Communicating with record custodians to ensure data accuracy;
(h) Identifying reasons for non-responsiveness;
(i) Identifying reasons for inconsistencies;
(j) Analysing the quality of variables;
(k) Reporting inconsistencies in registers;
(l) Reporting metadata omissions;
(m) Updating registers periodically.

VII. TOPICS FOR INVESTIGATION IN THE 2020 ROUND OF POPULATION CENSUSES

"Principles and recommendations for population and housing censuses" identifies 52 topics to be tackled during the 2020 round of population censuses, 26 of which were core topics and 26 were non-fundamental grouped under the following eight titles (table 3).

TABLE 3. TOPICS TO BE INVESTIGATED IN THE 2020 ROUND OF POPULATION CENSUSES

(a) *Geographical and internal migration characteristics*

Topic	Categorization in accordance with revision 3 of "Principles and recommendations for population and housing censuses"
Place of usual residence	✓
Place where present at the time of the census	✓
Place of birth	✓
Duration of residence	✓
Place of previous usual residence	✓
Place of usual residence at a specified date	✓
Total population	▪
Locality	▪
Urban and rural	▪

(b) *International migration characteristics*

Topic	Categorization in accordance with revision 3 of "Principles and recommendations for population and housing censuses"
Country of birth	✓
Country of citizenship	✓
Acquisition of citizenship	○
Year of arrival in the country	✓

(c) *Household and family characteristics*

Relationship to the reference person of household	✓
Household and family composition	▪
Household and family status	○

(d) *Demographic and social characteristics*

Sex	✓
Age	✓
Marital status	✓
Religion	○
Language	○
Ethnicity	○
Indigenous peoples	○
Disability characteristics	✓

(e) *Fertility and mortality*

Children born alive	✓
Children living	✓
Date of birth of last child born alive	✓
Births in the past 12 months	▪
Deaths among children born in the past 12 months	▪
Age, date or duration of first marriage	○
Age of mother at birth of first child born alive	○
Household deaths in the past 12 months	✓
Maternal or paternal orphanhood	○

(f) *Educational characteristics*

Literacy	✓
School attendance according to the International Standard Classification of Education	✓
Educational attainment	✓
Field of education and training	○

(g) *Economic characteristics*

Characteristics of jobs and establishments	✓
Status in employment	✓
Occupation	✓
Industry	✓
Place of work	○
Institutional sector of employment	○
Employment in the informal sector	○
Informal sector	○
Working time	○
Hours actually worked	○
Persons in production of goods	○
Unpaid work	○
Income from paid work	○

(h) *Agriculture*

Own-account agricultural production	○
Characteristics of all agricultural activities during the last year	○

Source: United Nations Statistical Commission, "Principles and recommendations for population and housing censuses", revision 3, 2015.

Key:
✓ Core topic.
▪ Core topic, derived.
○ Additional topic.

TABLE 4. HOUSING CENSUS TOPICS BY UNIT OF ENUMERATION

Topic	Housing units	Collective living quarters	Buildings	Households
Living quarters	▪	✓		
Location of living quarters	▪	✓	▪	▪
Occupancy status	✓			
Ownership – type of	✓			▪
Rooms- number of	✓			▪
Bedrooms – number of	○			○
Useful floor space		○		○
Water supply system	✓	○		▪
Drinking water – main source of	✓	○		▪
Toilet – type of	✓	○		▪
Sewage disposal	✓			▪
Solid waste disposal – main type of	✓			▪
Bathing facilities	✓	○		▪
Kitchen – availability of	✓	○		▪
Fuel used for cooking	✓			▪
Lighting and/or electricity	✓	○		
Heating – type and energy used	○			○
Hot water – availability of	○			○
Piped gas – availability of	○			○
Use of housing unit	○			○
Occupancy by one or more households	▪			✓
Occupants – number of	✓	✓		▪
Building – type of			✓	
Year or period of construction	○		○	
Dwellings in the building – number of	○		○	
Position of dwelling in the building			○	
Accessibility to dwelling	○			
Construction material of outer walls	✓		✓	
Construction material of floor and roof	○		○	
Elevator – availability of	○		○	
Farm building	○		○	
State of repair	○		○	
Age and sex of the reference person of the household				✓
Tenure				✓
Rental and housing costs				○
Furnished/unfurnished				○
ICT devices – availability of				✓
Cars – number of				○
Durable household appliances				○
Outdoor space – access to				○

Source: United Nations Statistical Commission, "Principles and recommendations for population and housing censuses", revision 3, 2015.

Key:
✓ Core topic.
▪ Core topic, derived.
○ Additional topic.

VIII. LINKING REGISTERS

A. LINKING BETWEEN INDIVIDUALS' REGISTERS

Individuals' registers and sub-registers contain people's names, date a place of birth and address. These registers are linked, via personal identification numbers, to other registers such as building and housing registers, tax registers in finance ministries and education registers. These registers are compared to ensure data accuracy.

B. LINKING ADDRESSES

It is possible to link individuals' addresses contained in the population registry to registers of economic establishments that contain the name and address of establishments in which individuals are employed. Most establishments have a numerical address indicating individuals' place of work, thus facilitating linking variables in the population registry to those in the building and housing registers. In general, building and housing registers are more accurate with regard to buildings than housing units, which are difficult to identify within a building given that some buildings have multiple entrances.

C. LINKING THE PERSONAL REGISTRY TO THE BUSINESS REGISTRY

When individuals' identification numbers are linked to the identification numbers of the institutions where they work, it is possible to determine individuals' economic activities because they work in the same field as the institution that employs them. Economic activity is a key variable in population censuses.

D. VISITORS AND CENSUSES

When conducting a census, it is vital no to include migrants who should not be classed as members of the population; these are people who are in a country for less than 90 days and should be counted as visitors. Registered emigrants in the population registry who return for less than 90 days should be counted as temporary emigrants and included in a country's population, in accordance with "Principles and recommendations for population and housing censuses". To check the accuracy of population data for those defined as residents in the population registry, it is necessary to consider data from other sources. If such data is unavailable, a population analysis is required to accurately determine their residency and economic activity, given that they cannot be considered residents if there have no data in comparative registers.

E. RECOMMENDATIONS

The following are recommendations to stakeholders in the Arab region to facilitate the use of administrative registers in the 2020 round of population and household censuses.

1. Use administrative registers, such as the central population registry, building and housing registers and the statistical business register, and their complementary registers. If some of these registers do not exist, they should be compiled, taking into account developments in migration and residency.

2. Allocate and use identification numbers for individuals in the population registry, for buildings and housing units in building and housing registers and for establishments in the statistical business registry, so as to facilitate linking these variables and including them in a single database.

3. Develop a legal framework that allows ministries and government institutions to periodically provide statistical access to administrative registers so as to conduct censuses, while protecting data privacy.

4. Request statistical offices to transform administrative registers, after revision and processing, into statistical registers containing variables that comply with international concepts and definitions.

5. Ensure government and society support for this type of census.

6. Identify variables not included in administrative registers, such as educational attainment for individuals over 10.

7. Implement international quality standards when revising data from administrative registers and linking them to complementary registers or to other data sources, such as household surveys and big data sources, especially those related to telecommunications, remote sensing and smart devices, among others. Adopting a general statistical model to process data increases the credibility of register-based census outcomes.

8. Provide data from administrative registers by geographic, administrative and spatial distributions for development and urban planning purposes.

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