

# Preparations with a pilot census for the 2020 register based census of Abu Dhabi

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**Abstract.** Many countries use administrative registers as an alternative to a field census enumeration, in order to save time, effort and money. Using administrative registers enables periodically updates of the population count and characteristics, without the long collection and processing period with the completion of a field enumeration census. Timely periodically updates are particularly useful for countries that undergo rapid population changes, as is the case in the United Arab Emirates (UAE) in general, and the Emirate of Abu Dhabi in particular.

The Statistics Centre of Abu Dhabi (the Centre) has thus decided to launch a project to develop a register-based census for the census 2020. This requires building a database, and maintaining its sustainability, and populating it with data on a continuous basis.

For this purpose, coordination has been established with the entities owning the administrative registers, with the support of senior management in those data providing agencies. These efforts have resulted in the signing of service level agreements, and data have begun to flow to the Centre by virtue of these agreements. The Centre has established specialised registers, such as population register, employees register, unemployed register, education register, and people with disabilities register.

The paper presents the different steps of preparations for the 2020 register-based census of Abu Dhabi, in general, and the process to conduct an administrative records based pilot census in particular.

Keywords: Enumeration, population, housing, administrative, census

## 1. Introduction

Countries, including developing countries, tend to rely more and more on administrative registers to determine the size of their population, and to identify its characteristics. Many countries use administrative registers data as an alternative to a field enumeration census, and this saves time, effort and money. Using administrative registers data allows the statistical agency to periodically update the population count and population characteristics, without waiting for a long period of time to conduct the field enumeration. This is particularly useful for countries facing rapid population changes. Both UAE, in general, and the Emirate of Abu Dhabi, in particular, have had fast population growth and rapid turn-over of the non-citizen population.

Using administrative registers to derive statistical indicators that monitor and analyse population and social changes, and providing them to decision-makers, will contribute to developing programs and policies that will benefit the community. This requires building a database and maintaining its sustainability by updating the contents of the database on a continuous basis.

The register-based census project is based on utilising administrative registers data, which are collected by government agencies for their own purposes, as an alternative to a traditional census, based on collecting data from the field. The objective is to create a detailed database on Abu Dhabi population's characteristics to support policy makers and decision makers in developing and monitoring social and economic policies and infrastructure programs in the Emirate.

SCAD work with other government entities to improve the data integration by establishing continuously updated data links. This involves using new technology for the access and future maintenance of the registers.

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A coordination mechanism has been established with the entities owning the administrative registers, with the support from senior management of the Statistics Centre – Abu Dhabi (the Centre), as well as the senior management in those providing agencies. These efforts have resulted in the signing of service level agreements, and the Centre has begun to receive data under these agreements. The Centre has established specialised registers such as, population register, employees register, unemployed register, education register, and people with disabilities register.

Establishing administrative registers at the Centre aims to:

- Conducting register-based censuses,
- Creating sampling frames for designing samples for demographic and social surveys,
- Providing statistical information and data that support planning and decision makers,
- Producing statistical indicators,
- Predicting future needs of social care services for the population, and
- Preparing detailed analytical reports to assist decision makers with developing policies.

The Centre's scope of responsibility is the Emirate of Abu Dhabi, and the project is linked to the Centre's strategic objective related to increasing reliance on administrative registers data, and reducing field surveys.

## 2. Project phases

A preparatory phase for Registration Census 2020 was conducted from the second quarter of 2015 until the third quarter of 2017. During this phase, the following tasks were performed:

- ensuring access to unit records files from administrative registers,
- installing and setting up SPSS for analysis of data received,
- understanding the databases metadata, contents and structures, and
- developing draft computer code for validation and cleaning of the data.

A pilot test was conducted in 2017 on administrative registers data, and this paper will present the challenges, and how we overcame them.

A pilot census was carried out in the second quarter of 2019 to measure the extent to which the challenges of the 2017 pilot test experience have been overcome, and the effectiveness of the solutions provided.

Finally, the register-based census 2020 will be conducted, taking into consideration lessons learned from the pilot test and the pilot census.

In preparation for the register-based census 2020 several key tasks were included, such as:

- Preparation of a work plan.
- Preparation of the budget.
- Description of the methodology.
- Identification of the need for field surveys for specific census topics.
- Identification of the need for specific registers, such as registers for population, buildings, housing units, government employees, unemployed persons, education, and people with disabilities.

Before conducting the pilot census, SCAD did a quality assessment of the source data. This assessment covered the effects of confidentiality issues and the SCAD quality dimensions:

- Organisational structure and the institutionalisation of statistical operations
- Relevance
- Clarity of administrative records preparation methodology
- Accuracy
- Coherence and consistency
- Accessibility
- Timeliness, periodicity and punctuality.

### 2.1. Methodology for identifying population count of the Emirate of Abu Dhabi

Following international standards, the concept of Abu Dhabi residents has been defined as individuals who are usual residents of the Emirate of Abu Dhabi, whether UAE nationals or non-UAE nationals. The definition covers citizens, who are usual residents of the Emirate, as well as those who are from outside of the Emirate or the United Arab Emirates and usually live in the Emirate of Abu Dhabi. It also covers all non-UAE nationals who intend to permanently and continuously reside in the Emirate, or for at least six months, regardless of visa status, or spent six consecutive months in the Emirate prior to the census benchmark. It should be noted that periods of temporary absence due to annual leave or work assignments are not considered to be an interruption within the consecutive six-month period.

Following this definition, Abu Dhabi residents:

- include all citizens holding family book issued from the Emirate of Abu Dhabi, regardless of their usual residence.

- include all the Cooperation Council for the Arab States of the Gulf (GCC) nationals who usually reside in the Emirate of Abu Dhabi.
- include all foreign residents who usually reside in the Emirate of Abu Dhabi.
- include all newly born children for Abu Dhabi UAE nationals as well as newly born children for non-UAE nationals who usually reside in the Emirate of Abu Dhabi.
- excludes UAE nationals or non-UAE nationals who passed away prior to the benchmark of administrative register data.
- excludes foreign residents, whose residence permits have been cancelled, and who left the Emirate of Abu Dhabi prior to the benchmark of administrative register data.

The individual shall be counted once in the population count regardless of the number of times of renewing residency or identity card.

### 3. Technical achievements

So far, the following tasks have been achieved:

At the level of concepts:

- Adopting the definition of the population of Abu Dhabi.
- Defining methodology associated with this definition.
- Sharing methodology with key data sources providers.
- Defining register-based census variables.

At the level of variables:

- Identifying variables and evaluating their coverage from administrative registers.
- Preparing an itemised card for each variable.
- Identifying and designing output tables.

At the level of classifications:

- Developing classifications of each variable according to the classifications applied by the Centre.
- Sharing classifications with data sources.

At the level of data:

- Receiving, processing and analysing data from some key sources.
- Designing the population register database populating the register-based census.
- Preparing a methodology of collecting data from other administrative registers.
- Developing the rules to match the variables.

### 3.1. Technical procedures

The Centre conducted the necessary statistical data processing on the data received from administrative sources. The data was reviewed and validated at the Centre, according to several stages and processes for preparing and processing the data to derive the statistical indicators. The procedures carried out included the following.

#### 3.1.1. Corresponding variables' names in different data sources (variables mapping)

The variables' names received from each source have been reviewed, corresponded and matched with the variables' names in the approved database, so that the same data feed into one variable regardless of the column name in the entity owning data. For example, identity card number variable has taken several different names in the sources, but these names have been corresponded with the variable name approved in the Centre's database, and the names given to this variable include, but are not limited to, SPM\_NATIONAL\_ID, Emirates ID, and PUPIL\_EMIRATES\_ID.

The name of identity card number variable has been unified in all registers and it has been named as NATIONAL\_ID, and it is the identification number through which the various registers' data have been linked.

#### 3.1.2. Coding

The Centre gave specific codes for data, and replaced text answers (sentences, words or codes), with specific codes and with specific connotations, giving each case a short code for that case. For example, the nationality variable contained several words denoting UAE nationals such as UAE, 101, and United Arab Emirates. All words and codes denoting UAE nationals have been unified into the United Arab Emirates and they have been given the code 784 according to the Country Code Classification issued by Statistics Division in United Nations.

#### 3.1.3. Classifications

The Centre classified the raw data received from

the entities in accordance with international classifications. The most important classifications used are as follows:

- Classification of education: International Standard Classification of Education (ISCED 2013)
- Classification of occupations: International Standard Classification of Occupations 2008 (ISCO-08)
- Classification of nationalities: UN Standard Country or Area Codes for Statistical Use (M49) (countries)

#### 3.1.4. Data validation

Data has been checked to detect some problems, errors, or inconsistencies among data. For example, for the variable age, which is calculated from the date of birth, possible problems include:

- missing birth date;
- unrealistic birth years (e.g. 1365) resulting in ages exceeding 300 years;
- birth year greater than the current year resulting in negative ages.

Obviously, the cause of these errors is data entry errors. In this case, the birth date was taken from other available sources. If the required data is not available, the birth year birth is entered from identity card number, where the digits from 4 to 7 in identity card number corresponding to the year of birth.

#### 3.1.5. Updating data

The Centre has updated the database through its administrative registers data, in accordance with clear procedures that identify the data to be updated, and identify the priority main source for each variable, and then the sub-source. For example, students' data have been taken in the administrative registers of the Department of Education and Knowledge to reflect grades that students have attained. The educational level is coded according to the International Standard Classification of Education (ISCED 2013). Then the data from the remaining available registers have been used. For example, the educational levels of employees working for Abu Dhabi government have been updated using the Department of Finance register. For individuals, whose educational levels are not available in other registers, their educational levels have been adopted as indicated in Ministry of Interior's data.

#### 3.1.6. Removing duplicates

The data have been verified according to specific procedures to ensure duplicated cases are detected, and that the same individual has been only registered once in the database. This step includes checking duplicates in the same register, and checking duplicates among registers. This is an important issue in dealing with administrative registers data. For example, it is normal for a person to be found duplicated in Department of Health's registers, because he visits the hospitals more than once. Each time the patient may be suffering from a different disease, other than the disease diagnosed during the first visit, and/or the patient may be following up with a different specialist doctor (Internist, Ophthalmologist, etc.). Therefore, no matter how many visits made by the patient to hospitals, we shall ensure that this person is not included in the population count more than once.

#### 3.1.7. Data quality assurance

The Centre provides an integrated system of procedures to ensure quality. This system ensures continuity of providing the required data to the Centre, and continuity of updating the register data. The system also provides consistency of data with statistical definitions and classifications. A specific mechanism is included for periodically measuring data quality, including revealing shortcomings or lack of coverage in the data. In addition, the Centre's integrated system of procedures, assures usage of the same codes for similar characteristics that share a particular feature, such as place of residence variable, and place of work variable.

After finishing the census pilot, SCAD compared the results of the pilot census with population estimates. The comparison showed minor differences. The total population in the pilot census was about 9% larger than the total estimated population. The differences were found to be mostly associated with differences in the scope of administrative records and the scope of population estimates.

## 4. Conclusion

The pilot census has revealed several strengths of administrative registers, characterised by a large number of variables, covering the UAE nationals through family books, as well as non-UAE nationals through residence permits. The data also has showed flexibility and ability to classify variables of the administrative registers according to international standard classifica-

tions, in addition to the possibility of deriving variables that are not available directly.

The lack of accuracy of the addresses of the resident population is considered one of the most important challenges faced by a register-based census in 2020. This challenge has been addressed by using the register data available, such as documentation of leases, owners' details, electricity and water details and school students' addresses. However, this issue remains a major challenge, which we hope to overcome, through enacting a legislation or administrative decision binding to register the address in detail according to the addressing project (Onwani) in Abu Dhabi, as well as binding to updating the address after a move. The person, who fails to comply with such legislation or administrative decision, should bear legal consequences.

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## References

- [1] ILO. (2008). The International Standard Classification of Occupations (ISCO-08).
- [2] SCAD. (2014). Nationalities (Countries) Classifications.
- [3] SCAD. (2014). Quality Assurance Manual for Administrative Records (in Arabic).
- [4] UNESCO. (2013). International Standard Classification of Education.
- [5] United Nations Department of Economic and Social Affairs, Statistics Division. (2019). United Nations Standard country or area codes for statistical use (M49). Available at: <https://unstats.un.org/unsd/methodology/m49/>.
- [6] United Nations Department of Economic and Social Affairs, Statistics Division. (2007). Principles and Recommendations for Population and Housing Censuses, Revision 2.