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Lessons learned from censuses of the 2020 round

Challenges regarding the use of the international definition of the total population and positive discrimination: experience of the Republic of North Macedonia 1991-2021

Note by North Macedonia *

Summary

1. The 2021 census is the third after the country's independence (following the 1994 and 2002 Censuses). The 1991 census was unsuccessful due to a boycott by one ethnic community, and the 2011 census was suspended due to the resignation of all ad-hoc members of a political body which, until this census, was responsible for conducting the censuses. All those censuses were characterized by a socio-political tension due to suspicions of abuse by the State Statistical Office (SSO) of the internationally-agreed definition of total population, in which persons staying abroad for more than 12 months are not considered to be a part of the total population; with exceptions included in the definition.

2. With this census, for the first time, the traditional method of enumeration and paper questionnaires was abandoned. Instead a combined method was used by using data from administrative sources and data owned by the SSO with the computer-assisted personal interview (CAPI) method of field enumeration, as well as for the first time computer-aided web interviewing (CAWI) for enumeration of citizens abroad. The way in which the SSO achieved this was through the creation of the Pre-Census Database and through the design of applications whereby the enumerators only had to follow the question that appeared on the screen, validated by complete implementation of the recommendations from The Conference of European Statisticians (CES) Recommendations for the 2020 Censuses of Population and Housing, Chapter V. Population bases, Table 1, which apply to all persons regardless of the reason for being abroad according to the column 'Regular return to family home'.

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NOTE: The designations employed in this document do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

I. Introduction

1. The Republic of North Macedonia has incorporated in its Constitution guaranteed rights for all those ethnic communities that in the last census comprise more than 20 per cent of the total population in the country; once at the state level and the second time at the municipality level.
2. This Constitutional provision was imposed after the conclusion of the so-called The Ohrid Agreement on 13 August 2001, which ended the internal armed conflict between the state and part of the Albanian population.
3. As an independent state, the Republic of North Macedonia conducted its first census in 1991, which was boycotted by part of the Albanian community. This boycott was due to the non-acceptance of the international definition (exceptions were part of the methodology) for the total population and the insistence that persons who have been absent from the country for more than 12 months be enumerated in the field even though the methodology stipulated that census units are only persons present in country and those who are absent for less than 12 months.
4. Because of this boycott, a new census was conducted in 1994, which became the first successful official census after independence from the Socialist Federal Republic of Yugoslavia. Although this census was accepted by the international community, in socio-political developments all ethnic groups expressed doubts about the results. As a result of distrust of the results of the 1994 census and demands for greater rights, part of the Albanian community started an armed conflict that lasted from January to November 2001.
5. This conflict ended with the conclusion of the so-called Ohrid Agreement on 13 August 2001, which was then incorporated into the Constitution. Part of this agreement guarantees the members of each ethnic community that has more than 20 per cent at the state level and at the municipal level to exercise certain rights.
6. The 2002 census was conducted the following year in November in a nationalism-laden socio-political situation. The 2002 census was successful and accepted by the international community, although there were a number of noted attempts to abuse the methodology and the definition of the total population by both enumerators and data providers. Although the 2002 Census Law provided for misdemeanour penalties for abuses, not a single person in the country was prosecuted.
7. The tensions from the 2002 census and the lack of trust in the results culminated during fieldwork during the 2011 census in which the addition of a question on the intention to stay abroad created an additional opportunity to circumvent the definition of total population. This opportunity to manipulate the census results was used massively by both the enumerators and the persons enumerated.
8. As a result of the massive disregard of the methodology and the definition of the total population, the 2011 census was suspended on the eleventh day when all members of the State Census Commission (a political body composed of political representatives from all communities responsible for conducting the census) submitted their irrevocable resignation.
9. The discontinuation of the 2011 census created additional tensions and mistrust in the statistical operation itself that needed to be overcome with the 2021 census.

10. In order to circumvent the socio-political problems previously faced by the SSO, it was decided to conduct the 2021 census by a combined method using administrative data and personal data by using the CAPI and CAWI channels of enumeration.
11. The SSO recognized the following groups of persons absent from the country for more than 12 months which were subject of abuses, leading to problems in the implementation of the definition of the total population in the previous censuses:
 - a. Persons engaged in independent work and/or education abroad
 - b. Family members accompanying a person engaged in independent work abroad and/or education
 - c. Not distinguishing between a family member and a household member or relatives from the first or second generation, etc.

In combination with:

- d. Non-acceptance of the definition where it is stated that returning to the country due to annual vacation, visiting relatives, seasonal holidays, etc. does not represent a termination of the stay abroad
 - e. Abuse of the part of the definition that refers to the intention of the length of the future stay abroad.
12. Therefore, the SSO incorporated the solutions from the CES Recommendations for the 2020 Censuses of Population and Housing (CESR) Chapter V. Population bases, Table 1, ‘Guidelines for usual residence of workers and students living away from family home for 12 months or more’ into its methodology and the design of applications for the 2021 census, and used them for all persons absent from the country for more than 12 months. This ensured a unified approach to enumeration of all persons who were absent from the country and their inclusion in/exclusion from the total population.

II. Census 2021

A. Methodological prerequisites for the planning of the 2021 census

13. Due to the previous problems in terms of consistency in following the definition of the total population, the SSO set the following goals that were to be implemented in the 2021 census:
 - a. To minimize tensions in the field or during the self-enumeration, all persons who were present in the country should be enumerated by enumerators, and only those persons who have a valid personal identification number (PIN) as North Macedonian citizens should be self-enumerated from abroad through a foreign IP address
 - b. Application solutions should be designed in a way to algorithmically know the status (in terms of being included in the total population or not) for each person individually, following a predefined set of questions
 - c. Minimizing the need for prior methodological knowledge of the enumerators/people who use the applications

- d. Applications to use data from the Pre-Census Database (PCD) based on PIN and in addition to the necessary data to enable recognition of the status in relation to the definition of total population, based on the last active record in the administrative sources.

B. Preparations for developing the pre-census database

14. Preparations for the 2021 census began in 2016 when a working group was formed in the SSO that visited all state institutions that have certain data referring to sub-categories for the population, in order to make a list of available data that can be used as potential official sources in the preparation of the PCD.
15. In addition to the actual content of the official data, special attention was paid to the source from which the institutions originally receive the data. At the same time, the classifications used, the periodicity and the method of revising the data were studied in detail, as criteria for evaluating the quality of the data in each of the institutions.
16. Based on these activities, SSO has divided the holders of relevant data into two basic groups:
 - a. Primary institutions that are directly responsible for collecting this data and maintaining it; and
 - b. Secondary institutions that take over the data from the primary institutions.
17. Based on this criterion, the following were recognized as primary institutions:
 - a. MoI (Ministry of Interior)
 - b. Agency for Real Estate Cadastre
 - c. Registry Office at the Ministry of Justice
 - d. Employment Service Agency
 - e. Health Insurance Fund
 - f. Central Registry
 - g. Pension and Disability Insurance Fund
 - h. Ministry of Labor and Social Policy
 - i. Ministry of Education and Science
 - j. Public Revenue Office
 - k. Ministry of Health
 - l. Ministry of Foreign Affairs
 - m. Ministry of Information Society and Administration.
18. And as secondary sources of information the following were recognized:
 - a. Association of Local Self-Government Units
 - b. Ministry of Agriculture, Forestry, and Water Economy.
19. In the next evaluation step, the primary institutions were subjected to additional data analysis based on the following additional criteria:

- a. Basic analysis of an administrative source
 - i. features of the registered persons
 - ii. suitability to the census data
 - iii. process of updates
 - iv. methodology used in handling the data (administrative versus statistical approach)
 - v. classification used (harmonization and standardization)
 - vi. origin of each data set of interest (directly from the person or indirectly)
 - b. Data accuracy (de facto versus de jure registered status)
 - c. Timeliness
 - i. time required to obtain data
 - ii. time required to process the data in the SSO and include them in the PCD
 - d. Availability (data availability frequency)
 - e. Completeness of data
 - i. registered population
 - ii. double registration
 - iii. under registration
 - iv. incomplete registration of the person (missing certain data)
 - f. Comparability (comparability of the same features in different registers)
 - g. Legal basis for obtaining data.
20. Additional information about this phase can be found in the references.

C. Test census 2019

21. The test census was successfully conducted in the spring of 2019. It was conducted in all eight statistical regions with one census area in an urban settlement and one census area in a rural settlement. During the selection of the areas, care was taken that they have the full characteristics of the region they represented in terms of the demographic, economic, educational and ethno-cultural characteristics of the region.
22. The objectives of the test census were:
- a. Testing the functionality of the application in the two basic parts: the GIS part and the methodological part.
 - b. Testing of the information technology (IT) census data system in terms of two-way data transfer and internet availability in different terrain and its geographical characteristics.
 - c. Testing the quality of the data in PCD and changing certain data that proved to be outdated or incorrect in the field.

- d. Testing the methodological approach in the development of the application in terms of the quality and volume of acquired knowledge of the enumerators during the training and minimizing the subjective methodological decisions of the enumerators in the enumeration process.
 - e. Testing of personal data protection and built-in solutions that prevented the possibility of data manipulation after the enumerators left the household, by any of the participants in the census and in any part of the process.
 - f. Testing the acceptability of this method of enumeration by citizens and the general public.
23. Based on the results of the test census, additional solutions were implemented in the IT census data system including the census application, which made this system fully functional.
 24. The application incorporated a completely autonomous enumeration process for each person individually based solely on the answers given, in which the enumerator's role as a methodologist who should follow the methodology was reduced to a technical person who only had to ask the questions that appeared to him or her on the screen, give additional explanation about the question if necessary and write down the answer.
 25. With this solution, the application recognized 44 different groups of questions (like 44 different questionnaires), and most importantly, it recognized automatically which of the enumerated persons were to be included as part of the total population.
 26. This methodological approach in the application for the census in the country was incorporated in the development of the application for self-enumeration from abroad.
 27. The final PCD contained data from the databases of the following institutions:
 - a. Ministry of the Interior and Ministry of Information Society and Administration as a primary base
 - b. AVRМ (Employment Agency)
 - c. FZOM (Health Insurance Fund)
 - d. MON (Ministry of Education and Science)
 - e. PIOM (Pension and Disability Insurance Fund)
 - f. SOC (Ministry for Labour and Social Policy)
 - g. Statistical surveys on graduates in tertiary and higher education (SSO data).

D. Census 2021

28. The 2021 census was conducted in the period from 5-30 September. The period for self-enumeration was between 1 March and 30 September 2021. This self-enumeration time period was imposed by the Covid-19 pandemic.
29. This enumeration approach was made possible thanks to the following elements of the IT census data system:
 - a. Creation of an IT census data system with integrated PCD
 - b. On-line interaction between IT census data system and field (self) enumeration

- c. Use of laptops with integrated application for data collection based on structure and content of questionnaires for individual enumeration units
 - d. Traditional door-to-door direct enumeration using trained census staff for CAPI
 - e. Web self-enumeration of citizens of North Macedonia living abroad.
30. All records for which the IT census data system could not automatically assign a usual residence status (URS) were processed manually.
31. As a result of the previous activities, in the PCD 2,608,921 active records (persons) were recognized through PIN.
32. The use of PIN to connect persons in the specified data sources enabled the use of 33 variables in the enumeration and processing process.
33. Of these, 13 were used to facilitate the census in the field or required their confirmation by the persons enumerated.
34. The greatest help during the field activity for the enumerated persons and for the enumerators were the following eight variables (in brackets is the number of persons for whom the data was available in the PCD):
 - a. Educational attainment (776,000)
 - b. Field of educational attainment (273,000)
 - c. School attendance – level of the educational programme (291,000)
 - d. Field of the educational programme (45,000)
 - e. Occupation (460,000)
 - f. Activity (642,000)
 - g. Source of livelihood – pension (320,000)
 - h. Source of livelihood – social transfers (307,000).
35. Thanks to the significant amount of data in the PCD for each PIN, and the algorithmic results for usual resident status as a combination of data from different institutions, the following three categories of population were identified:
 - a. Enumerated (CAPI) and self-enumerated (CAWI) persons who are part of the total population
 - b. Enumerated (CAPI) and self-enumerated (CAWI) persons who are not part of the total population
 - c. Unenumerated persons who, according to the algorithm for Usual Resident Status (URS), should be included in the Usual Resident Population.

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Table 1
Results of the Census 2021

Enumerated population	Number	Share (%)	Population Stock	Number	Share (%)
Total	2 192 778	100.00	Total	2 097 319	100.00
Field data	1 855 249	84.61	Usual resident population (URP)	1 836 713	87.57
Web data	204 804	9.34	Temporary present population	1 674	0.08
Imputed records	132 725	6.05	Population living abroad	258 932	12.35

(Additional information about these phases can be found in the references.)

III. Conclusions and suggestions for future recommendations

A. Conclusions

36. The success of the 2021 census is due to the creative way to methodologically circumvent the problems that burdened all previous successful and unsuccessful censuses through the following solutions:
 - a. The special design of census applications that minimized the subjectivity of enumerators and enumerated persons as responsible for determining which person should be part of the total population.
 - b. Implementation of the Recommendations from CESR Chapter V. Population bases, Table 1, ‘Guidelines for usual residence of workers and students living away from family home for 12 months or more’, by applying this part of the Recommendations to all persons regardless of the reason for being abroad, according to the column “Regular return to family home”.
37. This solved the methodological problems for:
 - a. Self-employed persons abroad and confusion about returning to the country for vacation, visiting family, etc. in the period of 12 months before the census;
 - b. Persons sent to work abroad by an employer who is not listed as an exception in the Recommendations and confusions arising in the field (solution was based on data from PCD where there is information about the employer)
 - c. Persons staying abroad accompanying a family member (from the previous two points), regardless of whether that person works or studies there.

- d. The wrong identification of persons who are family members with those persons who are from the same household or relatives from the first or second generation who live in the same apartment.

B. Suggestions for future recommendations

38. The purpose of this paper is to highlight the problems faced by the Statistical office in implementing the definition of Total Population in a situation where our legal system uses census data to positively discriminate certain ethnic groups living in the country. Namely, the challenges we face arise from the definition of total population that has been in use for the last 40 years, along with all its additions.
39. Although there are revisions with each new set of Recommendations, in its latest form it is still not clear enough for those who are not fundamentally familiar with the whole concept behind the definition of Total Population (based on usual residence). Therefore, despite the successful implementation of the 2021 census, we as a society are still faced with intentional or unintentional misinterpretations of the definition by politicians, influencers or the public as a whole for the part that refers to persons staying abroad for longer than 12 months and their inclusion in the total population of the country, regardless of defined exceptions.
40. With this paper, we as SSO want to initiate an international debate among census experts before the new revision of the definition, to make it more clearly understandable to those who are not fundamentally familiar with the concept behind the definition of total population and with censuses as a whole, which would prevent future manipulations in interpretation of the definition for population groups absent from the country for more than 12 months.
41. As lessons learned from the above, the SSO of the Republic of North Macedonia wants to suggest that in the next revision of the Recommendations the following proposals should be taken in consideration:
 - a. Addition of more clarified or separated distinctive explanations for:
 - i. How to enumerate a person absent from the country who left the country to accompany his/her married or unmarried partner who went to engage in independent work or for education and at the time of enumeration, where they either work or study or take care of the household, etc.?
 - ii. How to enumerate underage persons absent from the country who are staying there accompanying a member or members of their family nucleus from the previous point, and are there either for working or studying or taking care of the household, etc.?
 - iii. How to enumerate persons, adults or underage, residing abroad who are not part of the nuclear family but who have certain family ties with a person who went abroad for independent work or education, etc., and who refer to these persons in the enumeration process as their reason for saying abroad?
 - b. The possibility of dividing the part of the definition that refers to the intention of the persons to stay abroad for the next 12 months: considering all the benefits of this concept for the countries that have the possibility/system of recognizing such intention through registers, i.e., registered their residence; while in contrast,

- considering all the shortcomings of such a solution that was created in the countries from where those persons migrate and the impossibility of determining such intention through the registers they have (that is, they did not register their departure).
42. As a possible solution for thinking about this initiative, as a starting point of discussion, we want to propose the following two categories of population groups for the two groups of countries:
 - a. Foreigners: registered population that intends to stay in the census country in the next 12 months. Part of the total population of the country where they are registered.
 - b. Potential total population: citizens who moved abroad and who intend to return to the country from which they left in the next 12 months after the critical moment, and did not register their absence in the country registers. Not part of the total population of the country from which they migrate.
 43. The purpose of these proposals is to avoid the multiple enumeration in two or more countries of groups of persons who have an interest in being enumerated in more than one country, and to stop future manipulation in cases where positive discrimination based on the census results is or might be a part of the legal system of a country.
 44. We hope that international expert community will recognize the challenges we have faced as a country in previous 40 years. The Statistical Office of Republic of North Macedonia is willing to share all support and experience for the revision of the CES Recommendations for the 2030 round.

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Population projection 2022 – 2070

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