UNDP PROJECT

Towards more efficient use of administrative data:
analysis of seven administrative registers in Montenegro

FINAL PROJECT REPORT

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Contents

1. Introduction

For quite some time now, the European Commission (EC), the United Nations Economic Commission for Europe (UNECE) together with the National Statistical Institutes (NSIs) have come to the realization that in order to reduce costs and burdens for the responding units, the NSIs should move towards the greater use of the administrative sources. Some Nordic countries, especially Denmark, have completely transformed their statistical system in the previous decades and have been relying solely on administrative registers for the production of their official statistics. In recent years, an increasing number of European Member States as well as countries in the UNECE region started considering this possibility and moving towards register based statistics.

One of the goals of the Statistics Development Strategy 2014-2018 refers to the greater use of administrative resources in order to reduce costs and burden of reporting units. With respect to this, the Statistical Office of Montenegro (MONSTAT) has significantly increased the use of administrative resources for the production of statistical data in different domains in the previous period. However, there is still space to increase the use of administrative data. Before moving on to usage of the administrative data, each potential source of data must be analysed and checked in terms of the contents, definitions, as well as completeness of the data in the registry itself. In this way, the content of registers and the ability to use them for the production of official statistics can be assessed.

For the scope of this project, **seven registers** that are under the jurisdiction of different State bodies, have been chosen for the quality analysis. The registers in question are:

a) Central Population Register (Ministry of Interior)
b) Register of Business Entities (Tax Administration)
c) Register of Tax Payers (Tax Administration)
d) Register of Number of Children in Education (Ministry of Education)
e) Criminal Records Register (Ministry of Justice)
f) Register of Employment (Tax Administration)
g) Cadastre Register (Real Estate Directorate)

2. Objectives and expected results of the project

The objective of this project is to support MONSTAT to be able to use more efficiently administrative data across various institutions through the following activities:

Quality assurance of the contents of registers from the perspective of the needs of official statistics.

- Conduct a control of the content of the variables of all registers used by MONSTAT as administrative sources. This will ensure a clear definition of the legislation and subordinate legislation governing the content of each specific register, while ensuring full compliance of variables contained in registers with statistical needs.

Quality assurance of filling in the registers from the perspective of the needs of official statistics.

- Conduct a coverage analysis of each register variable. Namely, specific variables that exist in the registers have a low percentage of availability i.e. a large number of unknown phenomena, which, given the statistical aspect, are considered inaccurate, cannot be used in statistical production and is considered unavailable. By indicating lack of availability of existing variables in the specific register, the quality of data and the quality of the statistical product would significantly be improved when the data from the administrative registers are used.

The expected results of the project:

- Report on the current state of play

- Analyses on: (i) content of the variables of seven chosen registers (ii) coverage within these seven registers

- Final report on the achieved results and recommendations on: next steps for the increased usage of the administrative registers for statistical purposes and methodology that have been used for measuring quality of administrative sources related to content and coverage.

In order to achieve the expected results of the Project, it was necessary to establish cooperation with relevant authorities/institutions in Montenegro that are in charge of maintaining chosen administrative registers. This activity was implemented in order to gain insight into current situation of registers i.e. to determine which registers exist, their content, coverage, methodologies, definitions, classifications, updating, etc. In addition, the subject of preliminary analysis was current legislation as well. Legislation provides the key foundation for the use of administrative data sources for statistical purposes. It implies existing of national statistics act that gives the NSI the right to access administrative data on unit level with identification data and to link them with other administrative registers for statistical purposes. Moreover, for successful functioning of the system, existing of the signed technical protocols (between MONSTAT and "owners" of registers) that define the technical details related to the data that are received, periodicity for submission of data, the structure of tables etc. are paramount.

In order to reach this goal, meetings were organised with relevant institutions. A list of held meetings together with an overview of subjects discussed is described in paragraph 3.3.

3. Areas covered and summary of activities

3.1. First analysis of the Legal framework

Before initial meetings with the owners of the seven registers, it was necessary to analyse the core laws regulating the abovementioned seven administrative registers in order to gain an understanding of the laws and regulations that define the registers and their contents. It was noticed that some of the registers are defined in several different laws – for example, the Law on Central Population Register (CPR) defines the content of the Central Population Register but the variables that are found in the abovementioned register are part of different registers and therefore defined by different laws. For example, the data on births in CPR is collected through the Register on births; the data on Personal Identification Number (JMBG) is collected through Register of Personal Identification Number (JMBG) etc. On the other hand, it was found that in general, the Laws governing registers often lack clear specifications of the definitions and classifications of

variables so owners of the registers have their own "internal" documents or codebooks that define those classifications.

The list of all the Laws that define certain Register and/or variables in that register can be found in the explanatory tables in Annex at the end of this document.

3.2. Government Service Bus

This project is closely linked with the project of "Government Service Bus" (GSB) that was created on the initiative of the Government of Montenegro with the Ministry of Public Administration in charge. Government Service Bus is a government's project to implement a single electronic public administration system for electronic exchange of data between state and state administration bodies in order to create better conditions for efficient public administration and eliminate barriers to the further development of e-government in Montenegro

It enables and ensures the exchange of data between a number of different state bodies. The central function of this main interoperable system is to provide institutions with a unique communication platform for data exchange, as well as quality and fast service delivery, with the aim to:

- simplify exchange procedures,

- reduce data entry, in terms of retrieving data that has already been entered and is in one of the existing electronic registers and records, and not their multiplication through re-entry,

- increase transparency in state bodies in terms of giving information about data that is owned by different bodies (authentic or original data),

- improve the overall effectiveness of public administration.

The Law on Electronic Administration (Official Gazette of Montenegro 32/14) stipulates that the state administration bodies and state bodies are obliged to exchange data from the registers they keep and the information systems they manage through a single information system for electronic data exchange. State bodies and bodies of state administration are obliged to submit to the Ministry of Public Administration data on the registers they keep and the information systems they manage, for coordination and project management in the field of information society for the needs of those

bodies. The law stipulates that the Ministry of Public Administration shall keep records of electronic registers and information systems of state administration bodies.

Based on the requests submitted by the institutions and after determining the fulfilment of the technical requirements and safety standards, access to this system has been granted to the Ministry of Justice, Ministry of Internal Affairs, Ministry of Labour and Social Welfare, Ministry of Education and Tax Administration. However, it has been decided that other state bodies should also be connected to this system. At this moment, the technical preconditions for connecting MONSTAT to the GSB are still in the process of enabling the transfer of data from the Ministry of Education to MONSTAT. The last activities were carried out in February, when the application and Web services of MONSTAT were finalized. As a result of the abovementioned activities, administrative data were transferred so that the statisticians from MONSTAT could compare them with those data that they already receive via CD from the Ministry of Education. It turned out that the volume of data collected via Web service is smaller compared to data collection received by the CD. For this reason, the necessary changes have been made to the network and web services of the Ministry of Education. For now, a new check of the collected data is expected. At the further stage, MONSTAT should be able to exchange data with all other State bodies and bodies of state administration that own data used for the production of official statistics.

3.3. Establishing cooperation with State authorities

Once the first analysis of the Laws governing the selected registers was made, it was important to initiate meetings with the owners of the registers. It was imperative to discuss the information collected during the initial analysis of the laws governing administrative registers as well to initiate first contacts in order to assure the best possible future cooperation between MONSTAT and the relevant state representatives.

The meetings were held with the representatives of:

- Ministry of Interior (owner of the Central Population Register),

- Ministry of Education (owner of the Register of Number of Children in Education),

- Unemployment Office[1] (owner of the Register of Unemployment),

- Ministry of Justice (owner of Criminal Record Register),

- Tax Administration (owner of Register of Business Entities, Register of Tax Payers and Register of Employment),

- Real Estate Directorate (Cadastre).

The following sub-paragraphs give a short overview of the main discussions held with the representatives of different State authorities.

3.3.1. Meeting with the representatives of the Ministry of Interior

Meeting was held on the 25/02/2019 at the premises of MONSTAT.

Discussion: Ministry of Interior is the owner of the Central Population Register (CPR). The main discussion point was that, at this moment, MONSTAT cannot access the CPR since it does not have legal rights to access JMBG information that serves as a key identifier in CPR and adjoining registers that are under jurisdiction of the Ministry of Interior.

It was noted that even if some variables make part of this register, they are not "important" for the register owner; for example the variable "Structure of the Household" which would be of great significance to MONSTAT. It was however noted that, with some additional efforts, it would theoretically be possible to obtain the mentioned variable.

One of the great issues that exist in CPR is to determine the presence of Montenegrin citizens in the country. Even if there is a form that needs to be filled out when leaving the country, a vast majority of Montenegrin citizens are reluctant to do it, so there is no definite way to determine how many citizens have actually left the country.

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[1] At the beginning of the project, it was believed that the Unemployment Office was in charge of the register of Employment. During the meetings, it was, however, clarified that the Tax Administration owns the Employment Register while the Unemployment Office owns the register of Unemployment. Due to the fact that the Register of Unemployment contains data that are important for MONSTAT, it was decided to analyse this register as well. .

Data in the CPR are updated regularly.

Among other, it was pointed out that there is a new Law on Central Population Register that is in preparation and is expected for the beginning of the 2020.

3.3.2. Meeting with the representatives of Ministry of Education

Meeting was held on the 26/02/2019 at the premises of MONSTAT

Discussion: MONSTAT has an excellent cooperation with the Ministry of Education, who is the owner of the Register of Number of Children in Education, and has access to their register that is used in the production of official statistics on primary education.

Ministry of Education was connected with the CPR when the CPR was under the jurisdiction of Ministry for Information Society – this connection was interrupted due to technical issues. Since the interruption of the link with the CPR, the number of errors in the Register has increased due to limited possibilities of checking of errors and control mechanisms. Once reconnected with CPR, all the variables that are found in both registers will be updated and corrected (JMBG, sex, date of birth, etc.).

Addresses of the pupils in this register are entered upon personal declaration of parents but they can also be retrieved from CPR. MONSTAT has requested colleagues from the Ministry to create two fields for addresses for comparison purposes – address declared and address officially found in CPR. Representatives of the Ministry have agreed to this request.

Data in the Education register are updated upon the entering of the new data. MONSTAT would, however, need data at a certain date or moment in time. It was concluded that it is technically possible.

3.3.3. Meeting with the representatives of the Unemployment Office

Meeting was held on the 26/02/2019 at the premises of MONSTAT

Discussion: As mentioned before, the Unemployment Office is in charge of the Register of Unemployment which was not the primary scope of this project. However, the colleagues from MONSTAT have pointed out that this Register could provide important information. The meeting was originally dedicated to clarifying the variables existing in the records of unemployed persons that were identified in the analysis of publicly available legislation. For example the variable "number and kinship of members of a shared household": this variable is not relevant to Unemployment Office and is therefore planned to be removed when creating future data entry forms. On the other hand, this variable would be useful for MONSTAT, although the quality of this data is debatable, since it is not based on confirmation through public documentation but solely on personal declaration. This means that in reality, a large number of persons declare to be living alone, although other sources of information indicate otherwise. For this reason, the Unemployment Office did not provide this information to other users, as they are not able to guarantee quality.

When collecting data, the register is harmonized with the Law on the Territorial Organization of Montenegro, i.e. territorial units are country, municipalities and settlements. However, they are not able to display all the data by settlements. The number of unemployed persons can be reported at the settlement level, but in most cases, data are available only at the municipality level.

The available data is updated on a daily basis, but delays occur due to the untimely processing of documentation by other institutions. For example, it happens that the Tax Administration sends the employment information of a particular person, but only after a few months. At the same time, the same person is still registered as unemployed in Unemployment register.

It was decided to examine the possibility of exchanging data between MONSTAT and Unemployment Office, specifically through the JMBG of citizens, taking into account that the mentioned variable is already shared with the Tax Administration.

3.3.4. Meeting with the representatives of the Ministry of Justice

Meeting was held on the 27/02/2019 at the premises of MONSTAT

Discussion: Representatives of the Ministry (owners of the Criminal Records Register) have pointed out that at this moment their Register is not of a satisfactory quality. It was firstly under the jurisdiction of the Ministry of Interior and it was defined by a different set of legislative acts. This means that at this stage it lacs important information like some of the JMBG of criminally prosecuted person or exact information about the criminal offenses committed.

Ministry of Justice is currently undergoing significant legislative, technical and administrative changes that have a common goal to connect and update all the registers in the domain of Law and Justice. They plan to finish this project by January 2021. Even if at this point MONSTAT does not use data from their register, MONSTAT is asked to prepare a list of variables needed so that they can be successfully incorporated in the new system.

3.3.5. Meeting with the representatives of Tax Administration

Meeting was held on the 27/02/2019 at the premises of MONSTAT

Discussion: Tax Administration is the owner of three registers that are of interest for this project (Register of Business Entities, Register of Tax Payers, Register of Employment). It was established that the "Register of business entities" refers to the Central Register of Business Entities, the "Register of tax payers" refers to the Register of Taxpayers and Insured Persons, and in this register are kept records of employees. Therefore, "Employment records" is a sub-register belonging to the Register of Taxpayers and Insured persons. The legal framework for keeping the main Register of Tax Administration consists of the following documents:

- Law on Unified Registration and Reporting System for Calculation and Collection of Taxes and Contributions;
- Rulebook on the Form, Content, Method of Completing and Submitting the Unique Form of the Report on the Income Tax on Natural Persons;
- Unique Registration Application for Taxpayers, Contributors and Insureds (JPR Form).

The occupational classification used by the Tax Administration is based on ISCO 08 - International Standard Classification of Occupations. This classification consist of 4 digits in the Tax Administration, while MONSTAT would need a 6 digits mark.

The Tax Administration is planning to create a new information system as part of the Tax Administration Reform project. For this reason, MONSTAT needs to define its needs to the Tax Administration, so that they can consider these needs when defining and implementing a new information system.

The Tax Administration had a meeting with other institutions regarding the GSB. It is stated that metadata has already been provided to the competent institution. However, the Tax Administration considers that the proposed information exchange channel is not appropriate in all situations, such as the download of entire databases. That is, there is a reasonable doubt at the technical level that such an exchange of data would not be successful. If the technical solutions do not support the collection of data by the Tax Administration, the download of the data from the CD will be continued as before.

3.3.6. Meeting with the representatives of Real Estate Directorate

Meeting was held on the 28/02/2019 at the premises of the Real Estate Directorate

Discussion: Real Estate Directorate holds the Montenegrin Cadastre. One of the most significant projects of the Real Estate Directorate is the work on the Address register. Address register is of paramount importance for the census, both the register based one as well as traditional.

It is stated that it is crucial for MONSTAT that the Address register is up to the level of the housing unit, i.e. to a special section (Poseban Dio - PD) defined by Cadastral register. A special section relates to office space, apartment, basement, garage i.e. the part of the object that represents the spatial and usable whole (mode of use).

From the census point of view, the disadvantages of the Cadastre, at this point, are as follows:

- There is a lack of precise geographical indications for particular properties. Usually there are addresses up to the number of entrances and the number of apartments, but in some

cases, the address is at the settlement level (name of the settlement). The address register should solve this problem. Once the address formation method is determined, teams will go out to the field to match the paper situation with the field situation.

- Unique registration numbers for a large number of property owners are missing. It is common for one person to own more than one property.
- Changes in the way property is used are often not reported to the Cadastre. The owners do not report that they have converted the garages into apartments, flats into commercial premises, etc.
- Number of rooms is not available for all housing units.
- Year of construction is not available for all facilities.

The situation in the Cadastre does not always correspond with reality, both because of illegal construction and because of the delay of the owners to submit the application for entry into the Cadastre when the construction is completed. The Cadastre information is entered by the owner of the apartment building when the construction is completed. When the apartment is, for example, for sale, the owner of the apartment should submit an application for Cadastre entry. Real-world situations show that for economic reasons, such as tax evasion, it often happens that persons delay declaring ownership.

Compared to 2011 (date of the last census), the data in the Cadastre are at this moment, unfortunately, not more up-to-date, since this is largely independent from the Real Estate Administration. Namely, there is still a large number of illegal objects that have not been registered in the Cadastre. The responsibility for this lies within the property owners, who, while avoiding taxes and fees, do not apply for real estate Cadastre registration

4. Qualitative and quantitative analysis of registers

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4.1. Central Population Register - CPR

The Central Population Register, under the jurisdiction of the Ministry of Interior, is the "key" register (together with the Address Register) for the successful production of register-based data. Nevertheless, as mentioned before, MONSTAT has no legal rights at this moment to gain full access to this register because JMBG numbers that connect persons to their information are protected and cannot be shared with MONSTAT. Pursuant to the Law on the Central population register "State authorities and other users may use the data from the Central population register exclusively for the performance of tasks within their jurisdiction. The data from the Central register can be used for statistical, scientific, research and other purposes, without the identity of the person to whom data relate. Data from the Central population register can, on a personal request, use the person to whom this data relates".

In addition, according to the Law on protection of personal data it is noted that "When personal data is being used for statistical or scientific purposes, these data must be given for use in a form that does not reveal the identity of a person". If access to identifiers for statistical purposes is enabled or statistical code is used, the process of production of statistical results will be speeded up and space for other development activities will be freed which would allow the connection of administrative sources of data.

In order for MONSTAT to use the CPR without any obstacles, there is an utmost need to change the existing legislation or to come to a more "neutral" solution i.e. creation of a special "statistical" identifier that would protect the JMBG of citizens or creation of a special Personal Identification Number (PIN) like it was done in Croatia, for example.

However in 2020, the introduction of a new personal identification number is being prepared, with the aim to replace the existing unique personal identification number of citizens. The change is needed in order to reduce the administrative obligations of citizens, automate the exchange of data between institutions, increase the efficiency of the administration and enable a more efficient fight against corruption. In this way, MONSTAT would be enabled to take over the data of the Ministry

of Internal Affairs directly from the Central Population Register, providing the basis for identification of citizens in order to meet statistical needs, without violating the laws governing the exchange and protection of administrative and personal data.

Also, the proposal on amendments to the law includes the submission of data, where it is proposed that the Ministry of the Interior gives priority to electronic exchange in relation to the submission of data via magnetic media.

The most important proposed amendment to the law includes an article on the use of data from the Central Population Register. The existing law allows the use of administrative data for statistical purposes without identification of persons, while the amendment of the law provides for their use in accordance with the law on personal data protection. This would reduce the obstacle to MONSTAT's access to personal data by the Ministry of the Interior, but would not completely overcome it. A proposal to amend the Law on Personal Data Protection, which explicitly prohibits the use of data that reveals a person's identity, has not yet been formed.

In July 2019, the Law on Official Statistics and the System of Official Statistics was amended, thus achieving compliance with Regulation 223 of the European Union. Based on the changes, MONSTAT was given access to all administrative data with identifiers. In accordance with the above, an amendment to the Law on Personal Data Protection is expected.

The Central population register uses other administrative sources, such as Registers of Births, Register of Deaths, of Marriages, Permanent and Temporary Residence Registers, Register of Identification Numbers and Citizens Register, in order to create separate tables with population data. The CPR provides information about different categories of persons residing in Montenegro:

- **Montenegrin citizens**;
- **Montenegrin citizens with permanent or temporary residence abroad**;
- **Foreigners with a stay of up to 90 days**;
- **Foreigners who have property, rights and obligations in Montenegro in terms of pension and disability insurance, taxes, humanitarian and other grounds**; and
- **Foreigners with permanent or temporary residence in Montenegro.**

4.1.1. List of variables in the CPR – analysis of the content

Below are the variables that constitute the CPR register presented by different categories of persons residing in Montenegro. All the additional information about variables' definition, classification etc. can be found in the tables in Annex.

Montenegrin citizens

Variable
Identification number (JMBG)
Name and Surname
Born surname
Place of birth
Father's name
Mother's name
Residence
Address
Citizenship
Occupation
Degree and type of education
Marital status
Parent's identification number (mother, father or legal caretaker)
Name and identification number of a household holder
Kinship with the household holder
Members of a household
Date of death
Location of death

Montenegrin citizens with permanent or temporary residence abroad*

Variable
Identification number (JMBG)
Name and Surname
Born surname
Place of birth
Place of permanent residence
Father's name
Mother's name
Place of permanent residence in Montenegro
Address in Montenegro
Marital status
Date of death

*The dataset does not contain any variables on occupation, education, kinship or households

Data on foreigners with a stay of up to 90 days contains variables that refer to the information on foreigners who shortly reside in Montenegro. The dataset does not hold any variables on occupation, education, kinship and household.

Variable
Name and Surname
Born surname
Place of birth
Address
Date of check-in
Approved stay
Date of check-out
Place of residence
Citizenship

Data on foreigners who have property, rights and obligations in Montenegro in terms of pension and disability insurance, taxes, humanitarian and other grounds contains basic data like name, surname and date of birth, but also data on citizenship, identification number and data on rights and obligations. The dataset lacks variables on occupation, education, household and kinship.

Variable
Name and surname
Born surname
Date of birth
Citizenship
Identification number (JMBG)

Data on property, right or obligation

Data on foreigners with permanent or temporary residence in Montenegro contains the same variables as for data on Montenegrin citizens, but involves two additional variables: "Starting date" and "Approved date".

Variable
Identification number (JMBG)
Name and Surname
Born surname
Place of birth
Father's name
Mother's name
Residence
Address
Citizenship
Occupation
Degree and type of education
Marital status
Parent's identification number (mother, father or legal caretaker)
Name and identification number of a household holder
Kinship with the household holder
Members of a household
Date of death
Location of death
Starting date
Approved date

A draft Law on Amendments to the Law on the Central Population Register has been formed in 2020. The proposed changes include the creation of two additional administrative databases:

1) **on foreigners who have been granted asylum or subsidiary protection in Montenegro**; the content of this database would include the following variables: identification number, surname and first name, surname, place of birth, father's name, mother's name, address, citizenship, level and title of education qualification, marital status, type of approved international protection, date of international protection approval and duration of international protection;

2) **on foreigners who have not been granted permanent or temporary residence in Montenegro, but have property or rights and obligations** based on pension and disability insurance, taxes, humanitarian or other reasons, if records are kept in accordance with the law. The content of this database would include following variables: ID number, surname and name, birth name, place of birth, father's name, mother's name, address, citizenship, level and title of education qualification, marital status, type of approved international protection, date of international protection approval and duration international protection.

UNECE / EUROSTAT have created recommendations and regulations that define the core variables for the population census. CPR includes several core variables that are of great importance for the next census as well as for the social statistics in general.

The recommended or obligatory census variables that can be found in CPR include the usual **place of residence (residence, address), legal marital status**, **occupation**, **degree of education**, **country of birth**, **citizenship** and **place of birth**.

The usual place of residence is the core variable, which according to the recommendations implies the usual place of residence for one or more persons, regardless of whether they are present during the reference time of the population census. According to tables with variables from the Central Population Register relating to the determination of the place of residence, it is evident that there are several variables that could provide this information: residence; address; place of permanent residence; address in Montenegro; and a place in Montenegro. However, the address should refer to the populated place, street and number of the apartment, but does not include the concept of the usual place of residence, does not include a timeframe for the length of stay at the specified address

(person lives or intends to live for at least one year or more at the specified address), but also does not provide any concrete information if person actually resides in the declared address.

For the data for **Montenegrin citizens with permanent or temporary residence abroad**, the place of permanent residence refers to the permanent accommodation of the inhabitants of Montenegro abroad. The problem with this variable is similar to the one defining the address in Montenegro and the residence in Montenegro, because the address in Montenegro refers to the address of Montenegrin citizens while they are on a permanent or temporary stay abroad. Moreover, as already mentioned, one of the great issues that exist in CPR is to determine the presence or absence of Montenegrin citizens in the country. Even if there is a form that needs to be filled out when leaving the country, a vast majority of Montenegrin citizens are reluctant to do it, so there is no definite way to determine how many citizens have actually left the country.

Based on the above, it can be concluded that the location of the residential unit, that is, the usual place of residence, is closest to the variable in the data on Montenegrin citizens regarding the place of residence, **but the time factor**, crucial to determine the usual place of residence, is not included. This impedes the use of these variables from the Central Population Register, as such, in order to determine the usual place of residence of population in Montenegro.

The variable relating to **legal marital status** is also one of the core variables, which according to international recommendations is defined as the legal status of each individual's marriage in relation to marital laws (or customs) of the country (often referred to as *de jure* status). Data on marital status in the Central Population Register are based on the legal status, so from the aspect of relevance of content it is possible to use the mentioned core variable for the needs of the population census.

Regarding the economic characteristics of the population, the core variable **"occupation"** refers to the type of work performed on the main work engagement (or the last work engagement in the case of an unemployed person), as defined in the main tasks and duties performed at work, regardless of the activity by which the job is categorized or the working status of a person. The variable related to occupation in CPR is identified in the data relating **only to Montenegrin**

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citizens, where it relates to the work that a person performs in order to earn income. This means that this core variable does not comprise data about other groups of residents of Montenegro and thus cannot provide information about total working resident population of the country. Moreover it is unclear how "fast" the variable is updated and if there are (and how many) cases when, for example, someone lost their job or switched the type of work performed but the variable has been left unchanged. In this part, it is necessary to harmonize the content of administrative data before the possible use for the needs of the population census. That is, at this moment, the quality dimension that relates to the relevance of the data on occupation is not met, same as the coverage.

The **level of education** is the core variable that, based on the contents of the CPR, can be examined in terms of eligibility for statistical purposes. According to UNECE / EUROSTAT recommendations for the 2020 Round of censuses, the level of education refers to the highest level of education that a person has successfully completed. In accordance with the International Standard Classification of Education, the level of education is measured in relation to the highest education program that has been successfully completed, which is usually confirmed by a recognized certification.

In the data on Montenegrin citizens the variable "Degree and type of education" is listed, but does not adequately address the needs of the population census. Due to the change of education system in Montenegro, the data in the Central population register are collected in accordance with the old and new classifications and based on personal declaration.

The **country of birth** is defined by the international recommendation as the country where the person's place of birth is located. In the data on Montenegrin citizens, the variable "Place of Birth" refers to a settlement and a municipality, and for foreign nationals refers also to the country of birth. In the data on foreigners with a stay of up to 90 days, the variable "Place of birth" refers to the country of birth of a registered foreigner. From the point of compliance of definitions, available administrative data are also relevant for the purposes of the census.

Citizenship is defined in accordance with the recommendations as a special legal relationship between an individual and his country, acquired by birth or naturalization, either by declaration, option, marriage or other means in accordance with national legislation. Citizenship is a variable in the data on Montenegrin citizens, data on foreigners with a stay of up to 90 days, as well as in the data on foreigners who have property, rights and obligations in Montenegro on pension and disability insurance, taxes, humanitarian and other grounds. Consequently it is possible to use this variable from administrative sources.

4.1.2. Qualitative analysis

Since for this project it was not possible to have a direct access to the CPR, qualitative analysis was made for the variables that are delivered to MONSTAT and which MONSTAT uses for the production of demographic data. These are data from administrative **Registers of births, Deaths, Permanent or temporary residence, Citizens and Foreigners**.

Regarding data from the **Register of births**, almost all variables have a 100 percent of completeness. That is, the problem of missing values is related only to five variables: "Citizenship ID (Child)", "Citizenship (Child)", "Father ID Highest Completed School", "Father Highest Completed School" and "Father ID Occupation". While the variables of Citizenship of Child have missing values, other mentioned variables recorded roughly 50% of completeness. This can be observed in the following table:

Register of births Name of the field in database	% of completeness
ID of a person (ID LICA)	100%
Month of entry (MJESEC UPISA)	100%
Year of entry (GODINA UPISA)	100%
ID Municipality of entry (ID OPŠTINA UPISA)	100%
Municipality of entry (OPŠTINA UPISA)	100%
Entry number (REDNI BROJ UPISA)	100%
Live Dead (ŽIVO MRTVO)	100%
Gender (POL)	100%
Date Time of birth (DATUM VRIJEME ROĐENJA)	100%
House number of residence of the mother (KUĆNI BROJ PREBIVALIŠTA MAJKE)	99%
ID of address of residence of the mother (ID ADRESE PREBIVALIŠTA MAJKE)	100%
Address of residence of the mother (ADRESA PREBIVALIŠTA MAJKE)	100%
ID of place of residence of the mother (ID MJESTA PREBIVALIŠTA MAJKE)	100%
Place of residence of the mother (MJESTO PREBIVALIŠTA MAJKE)	100%
ID of municipality of residence of the mother (ID OPŠTINA PREBIVALIŠTA MAJKE)	100%
Municipality of residence of the mother (OPŠTINA PREBIVALIŠTA MAJKE)	100%
ID of country of residence of the mother (ID DRŽAVE PREBIVALIŠTA MAJKE)	100%
Country of residence of the mother (DRŽAVA PREBIVALIŠTA MAJKE)	100%
ID of place of birth (ID MJESTA ROĐENJA)	99,9%
Place of birth (MJESTO ROĐENJA)	100%
ID Municipality of birth (ID OPŠTINA ROĐENJA)	99,9%
Municipality of birth (OPŠTINA ROĐENJA)	100%
ID of country of birth (ID DRŽAVE ROĐENJA)	100%
Country of birth (DRŽAVA ROĐENJA)	100%
ID of citizenship (of the child) (ID DRŽAVLJANSTVA (djeteta))	**0.00%**
Citizenship (of the child) (DRŽAVLJANSTVO (djeteta))	**0.00%**
ID of the legal basis of the entry (ID ZAKONSKOG OSNOVA UPISA)	100%

Legal basis of the entry (ZAKONSKI OSNOV UPISA)	100%
Father Date of birth (OTAC DATUM ROĐENJA)	97.9%
Father ID Citizenship (OTAC ID DRŽAVLJANSTVO)	97.9%
Father Citizenship (OTAC DRŽAVLJANSTVO)	97.9%
Father ID Highest completed school (OTAC ID NAJVIŠA ZAVRŠENA ŠKOLA)	**53.3%**
Father Highest completed school (OTAC NAJVIŠA ZAVRŠENA ŠKOLA)	**53.2%**
Father ID Occupation (OTAC ID ZANIMANJE)	**50.4%**
Father ID Place of birth (OTAC ID MJESTA ROĐENJA)	92.4%
Father place of birth (OTAC MJESTO ROĐENJA)	92.4%
Father ID Municipality of birth (OTAC ID OPŠTINA ROĐENJA)	86.0%
Father Municipality of birth (OTAC OPŠTINA ROĐENJA)	97.9%
Father ID of the country of birth (OTAC ID DRŽAVE ROĐENJA)	97.9%
Father Country of birth (OTAC DRŽAVA ROĐENJA)	97.9%
Mother Date of birth (MAJKA DATUM ROĐENJA)	98.5%
Mother ID Citizenship (MAJKA ID DRŽAVLJANSTVO)	98.5%
Mother Citizenship (MAJKA DRŽAVLJANSTVO)	98.5%
Mother ID Highest completed school (MAJKA ID NAJVIŠA ZAVRŠENA ŠKOLA)	83.0%
Mother Highest completed school (MAJKA NAJVIŠA ZAVRŠENA ŠKOLA)	82.9%
Mother ID Occupation (MAJKA ID ZANIMANJE)	81.4%
Mother ID Place of birth (MAJKA ID MJESTO ROĐENJA)	80.1%
Mother Place of birth (MAJKA MJESTO ROĐENJA)	85.3%
Mother ID Municipality of birth (MAJKA ID OPSTINA ROĐENJA)	80.1%
Mother Municipality of birth (MAJKA OPŠTINA ROĐENJA)	98.5%
Mother ID of the country of birth (MAJKA ID DRŽAVE ROĐENJA)	98.5%
Mother of the country of birth (MAJKA DRŽAVA ROĐENJA)	98.5%

The percentage of completeness for mentioned variables (marked in **bold** in the table above) is unsatisfactory and negatively affects the quality of a statistical product and cannot be used as such. On the other hand, the rest of the variables collected from the Register of Births record almost full completeness and meet the needs of MONSTAT.

Below are presented the variables collected by MONSTAT from the **Register of deaths**.

Register of deaths Name of the field in database	% of completeness
ID of a person (ID LICA)	100%
Month of entry (MJESEC UPISA)	100%
Year of entry (GODINA UPISA)	100%
ID Municipality of entry (ID OPSTINA UPISA)	100%
Municipality of entry (OPSTINA UPISA)	100%
Entry number (REDNI BROJ UPISA)	100%
Gender (POL)	100%
Date Time of death (DATUM VRIJEME SMRTI)	100%
Date of birth (DATUM RODJENJA)	100%
ID of the place of birth (ID MJESTA RODJENJA)	87.2%
Place of birth (MJESTO RODJENJA)	100%
ID of the municipality of birth (ID OPSTINE RODJENJA)	87.2%
Municipality of birth (OPSTINA RODJENJA)	100%
ID of the country of birth (ID DRŽAVE ROĐENJA)	100%
Country of birth (DRŽAVA ROĐENJA)	100%
House number of residence (KUĆNI BROJ PREBIVALIŠTA)	94.9%
ID of the address of residence (ID ADRESE PREBIVALIŠTA)	99.4%
Address of residence (ADRESA PREBIVALIŠTA)	99.4%
ID of the place of residence (ID MJESTA PREBIVALIŠTA)	100%
Place of residence (MJESTO PREBIVALIŠTA)	100%
ID of the municipality of residence (ID OPŠTINE PREBIVALIŠTA)	100%
Municipality of residence (OPŠTINA PREBIVALIŠTA)	100%
ID of the country of residence (ID DRŽAVE PREBIVALIŠTA)	100%
Country of residence (DRŽAVA PREBIVALIŠTA)	100%
ID Marital status (ID BRAČNO STANJE)	100%

Marital status (BRAČNO STANJE)	**49.4%**
ID Citizenship (ID DRŽAVLJANSTVO)	100%
Citizenship (DRŽAVLJANSTVO)	100%
ID Highest completed school (ID NAJVIŠA ZAVRŠENA ŠKOLA)	**34.3%**
Highest completed school (NAJVIŠA ZAVRŠENA ŠKOLA)	**34.0%**
ID Occupation (ID ZANIMANJE)	**33.6%**
ID of the legal basis of the entry (ID ZAKONSKOG OSNOVA UPISA)	100%
Legal basis of the entry (ZAKONSKI OSNOV UPISA)	100%

As in the case of administrative data from the Register of births, the data from the Register of deaths recorded an insufficient coverage for only a small number of variables. These are the variables "Marital Status", "ID Highest Completed School", "Highest Completed School" and "ID Occupation".

For the listed variables, the percentage of completeness shows less than 50%.

The following table presents the variables on **internal migration**, collected by MONSTAT from the Register of permanent residence, referring to Montenegrin citizens.

According to the tabular presentation, it is evident that there is almost 100% completeness. That is, a small percentage of the missing values is evident for the "Occupation" variable, but the situation is not alarming and does not significantly affect the statistical result.

Research: Internal migrations (Registration of residence for Montenegrin citizens)		
Collected variables	**Coverage - percentage of occupancy by variables**	
	2017	**2018**
ID of a person (ID lica)	100%	100%
Date of registration of the residence (datum prijave prebivališta)	100%	100%
Gender (pol)	100%	100%
Age (starost)	100%	100%
Place of birth (municipality of birth in Montenegro or another country - code and name) (mjesto rođenja (opština rođenja u Crnoj Gori ili druga država – šifra i naziv))	100%	100%
Degree of professional education (stepen školske spreme)	100%	100%
Occupation (zanimanje)	98%	98%
Marital status (bračno stanje)	100%	100%
Residence to which the person is registering (code and name of the settlement and municipality) (prebivalište na koje se lice prijavljuje (šifra i naziv naselja i opštine))	100%	100%
Residence from which the person is checking out (code number name of the settlement and municipality) (prebivalište sa kojeg se lice odjavljuje (šifra naziv naselja i opštine))	100%	100%

Below are the variables that provide information on **international migration**, collected by MONSTAT from the Registers of Permanent and temporary residence, and the Register of foreigners.

The table is divided on two grounds. Primarily based on persons who have immigrated to Montenegro or emigrated from Montenegro. On the other basis, the table is divided according to data collected for Montenegrin or foreign citizens.

International migration			
Source: Register of permanent and temporary residence, register of foreigners (Ministry of the Interior)			
Persons immigrated to Montenegro:		**Persons emigrated from Montenegro:**	
a) for Montenegrin citizens:		*a) for Montenegrin citizens:*	
Name of the variable:	*Completeness*	*Name of the variable:*	*Completeness*
	2017		**2017**
Identification number of a person (identifikacioni broj lica)	100%	Identification number of a person (identifikacioni broj lica)	100%

Date of entry (day, month, year) (datum prijave (dan, mjesec, godina))	100%	Date of check-out (day, month, year) (datum odjave (dan, mjesec, godina))	100%
Gender (pol)	100%	Gender (pol)	100%
Age of the person (starost lica)	100%	Age of the person (starost lica)	100%
Year of birth (godina rođenja)	100%	Year of birth (godina rođenja)	100%
Municipality of birth in Montenegro or another country – code and name (opština rođenja u Crnoj Gori ili druga država – šifra i naziv)	100%	Municipality of birth in Montenegro or another country – code and name (opština rođenja u Crnoj Gori ili druga država – šifra i naziv)	100%
Degree of professional education (stepen školske spreme)	100%	Degree of professional education (stepen školske spreme)	**41%**
Marital status (bračni status)	100%	Marital status (bračni status)	**33%**
Country of last residence – code and name (drzava prethodnog prebivalista - šifra i naziv)	**15%**	Settlement from which the person is checking out – code and name (naselje iz kojeg se lice odjavljuje - šifra i naziv)	100%
Settlement where the person is registering (naselja gdje se lice prijavljuje - šifra i naziv)	100%	Municipality from which the person is checking out – code and name (opština iz koje se lice odjavljuje - šifra i naziv)	100%
Municipality where the person is registering (opštine gdje se lice prijavljuje - šifra i naziv)	100%	Country of new residence – code and name (drzava novog prebivalista - šifra i naziv)	100%
Code of occupation (šifra zanimanja)	99%	Code of occupation (šifra zanimanja)	**67%**
b) for foreign nationals:		*b) for foreign nationals:*	
Identification number of a person (identifikacioni broj lica)	100%		
Date of the first registration – first entry into Montenegro (day, month, year) (datum prve prijave - prvi ulazak u CG (dan, mjesec, godina))	100%	**No data is provided.**	
Date of registration in the current (reference) year (day, month, year) (datum prijave u tekucoj(referentnoj) godini (dan, mjesec, godina))	100%		
Date of approved stay (day, month, year) (datum odobrenog boravka (dan, mjesec, godina))	100%		
Gender (pol)	100%		
Age of the person (starost lica)	100%		
Year of birth (godina rođenja)	100%		
Country of birth (code and name) (drzava rodjenja (šifra i naziv))	100%		
Citizenship (drzavljanstvo)	100%		

Degree of professional education (stepen školske spreme)	100%
Marital status (bračni status)	94%
Country of the last residence (code and name) (drzava prethodnog prebivalista (šifra i naziv))	100%
Settlement where the person is registering (code and name) (naselje gdje se lice prijavljuje (šifra i naziv))	100%
Municipality where the person is registering (code and name) (opština gdje se lice prijavljuje (šifra i naziv))	100%
The reason for immigration (the purpose of ie the basis of residence) (razlog doseljenja(svrha tj.osnov boravka))	100%
Whether the person is registering for the first time (da li se lice prvi put prijavljuje)	100%

It is evident that the completeness is satisfactory for a large number of variables. Only certain variables have a low level of completeness. The least complete variable is "Country of previous residence - code and name", referring to Montenegrin citizens who moved to Montenegro and which contains only 15% of data.

On the other hand, in terms of Montenegrin citizens who have emigrated from Montenegro, insufficient completeness concerns variables "Degree of professional education", "Marital status" and "Code of occupation".

Regarding **foreign nationals**, data are available for persons who have immigrated to Montenegro. It is evident that there is only a small percentage of missing values (6%) for the variable "Marital status", which does not pose a major risk to the quality of the statistical product.

There is no data related to **foreign citizens who emigrated from Montenegro**. These are the persons who were usually granted a short stay, but did not report departure from Montenegro after the expiration of the approved stay. In this part, it is necessary to use potential alternative sources, which would recognize the departure of persons from the country, but it is also necessary to introduce control measures, i.e. to tighten the measures obliging persons to report arrival and departure to and from the country.

Also, it is important to note that the Ministry of the Interior has no data on how long a person intends to stay outside Montenegro. Establishing this variable would help the official statistics to be further harmonized with international regulations and the concept of usual residence.

4.1.3. General remarks and observations

In general, CPR complies with some key characteristics that are requested for the successful implementation of the population census. The characteristic of the **individual enumeration** is satisfactory, because the information is collected for each inhabitant in Montenegro.

However, this administrative source does not meet the criteria of **simultaneity** of the population census - the information obtained on individuals and dwellings should refer to a specific and unique reference period.

The characteristic of **universality** (census provides data that covers all persons, households and dwellings in precisely defined territorial areas) is also not met, because the CPR cannot provide by itself the number of all usual residents of Montenegro which would be in accordance with the recommendations of the UNECE / EUROSTAT, measure based on the concept of place of usual residence. Moreover, CPR does not include all census units; household and dwellings data are missing.

One of the key characteristics of population census is to provide **data for small areas** - census should "produce data on the number and characteristics of the population and housing related to the smallest geographic areas of the country and small population subgroups, in accordance with the basic task of protecting confidentiality." With regard to the Central population register, statistical representation of characteristics and structure of population for territorial units lower than the municipality is not always available.

The special value of the Central population register is that it uses the unique citizen identification number (JMBG) Register as a source of data. By using JMBG, a network of administrative and statistical data sources could be created, but it is necessary to provide cooperation and clear legal authorization. At the moment, as already mentioned, it is not possible to obtain data from the CPR on an individual level with identifiers since according to the Law on protection of personal data it is noted that "When personal data is being used for statistical or scientific purposes, these data must be given for use in a form that does not reveal the identity of a person". If access to identifiers for statistical purposes is enabled or statistical code is used as it is currently being implemented, the process of production of statistical results will be speeded up and space for other development activities will be freed which would allow the connection of administrative sources of data.

However, if procedural matters were developed in order to facilitate access to administrative data, but also in the direction of necessary harmonization of the content of certain administrative variables for statistical purposes, as well as their updating and territorial coverage, it would be possible to collect data on geographical, demographic, economic, educational, migration characteristics of the population and the characteristics of the household and family, that is, variables of essential importance for the census of population, households and dwellings.

4.2. Central Register of Business Entities - CRBE

Registration of business entities in Montenegro is carried out in the Central Register of Business Entities. The Tax Administration is responsible for managing the CRBE and includes registration of business entities, entrepreneurs, investment funds, parts of companies and parts of foreign companies.

4.2.1. List of variables in the CRBE – analysis of the content

Below are the variables that are collected in the above-mentioned register. They are listed on the basis of application forms of the Tax Administration of Montenegro, which refer to the registration of business entities, entrepreneurs, investment funds, parts of companies and parts of foreign companies.

Registration - Business entity			
Categories of data	**Variables**	**Categories of data**	**Variables**
Applicant	Unique identification number	Reserved name	Confirmation number of reserved name
	Name and surname		Date of confirmation of the reserved name
	Phone number	Decision of the state body	Date of the decision of the state body
	E - mail		Number of decision of the state body
	Country	Main activity	Main activity
	Municipality	Form of property	Form of property
	Place	Contact	Phone number
	Street		Fax
	Street number		E - mail
Basic information	Form of organization		Website address
	The creation of a business entity	Capital	Capital origin
	Full name		Data on basic capital
	Shortened name	Solution of the Securities Commission	Date of solution of the Securities Commission
	The period for which the company is established		Number of solution of the Securities Commission
	Data on the Statute		Date of the solution for the success of the issue
	Contract information / decision on the establishment		Number of solution for the success of the issue
Address of the management - headquarters	State of management	Data on founders	Status
	Municipality of management		Unique identification number
	Place of management		Name and surname
	Street of management		Headquarters / Address
	Street number of management		Share
Address to receive official mail	Country to receive official mail	Name of the managing authority	Name of the managing authority
	Municipality to receive official mail	Data on the director and/or the managing authority	Status of the managing authority
	Place to receive official mail		Unique identification number
	Street to receive official mail		Name and surname
	Street number to receive official mail		Address
Address of the main place of business	Country of the main place of business		Authorization in traffic
	Municipality of the main place of business		Authorized to act
	Place of the main place of business	Other registrations	Other registrations
	Street of the main place of business		
	Street number of the main place of business		

The second table consists of variables on the registration of entrepreneurs. It involves several categories of data, which refer to the basic information, activity, contact and data on the entrepreneur.

Registration of entrepreneurs			
Categories of data	Variables	Categories of data	Variables
Applicant	Unique identification number	Contact	Phone number
	Name and surname		Fax
	Phone number		E - mail address
	E - mail address		Website address
	Country	Data on the entrepreneur	Status of entrepreneur
	Municipality		Unique identification number of entrepreneur
	Place		Name and surname of entrepreneur
	Street		Address of entrepreneur
Basic data	Street number	Data on the authorized person	Status of the authorized person
	Form of organization		Unique identification number of the authorized person
	The trade name under which the activity is carried out		Name and surname of the authorized person
Place of activity	Country of activity		Address of the authorized person
	Municipality of activity	Address to receive official mail	Country to receive official mail
	Place of activity		Municipality to receive official mail
	Street of activity		Place to receive official mail
	Street number of activity		Street to receive official mail
Main activity	Main activity		

The third table consists of variables that refer to the registration of a part of a foreign company.

Registration of a part of a foreign company			
Categories of data	**Variables**	**Categories of data**	**Variables**
Applicant	Unique identification number	Address to receive official mail	Country to receive official mail
	Name and surname		Municipality to receive official mail
	Phone number		Place to receive official mail
	E - mail address		Street to receive official mail
	Country		Street number to receive official mail
	Municipality	Address of the main place of business	Country of the main place of business
	Place		Municipality of the main place of business
	Street		Place of the main place of business
	Street number		Street of the main place of business
Basic data	Form of organization		Street number of the main place of business
	Name / alternative name of a part of a foreign company	Reserved name	Confirmation number of reserved name
	Date of decision on establishment		Date of confirmation of the reserved name
Parent company	Form of organization	Contact	Phone number
	Registration number		Fax
	Identification number		E - mail
	Name of the parent company		Website address
	Country of the parent company	Name of the managing authority	Name of the managing authority
	Place of the parent company	Data on the director and/or the managing authority	Status of the managing authority
	Data on the Statute		Unique identification number
	Contract information / decision on the establishment		Name and surname
Address of the management - headquarters	State of management		Address
	Municipality of management		Authorization in traffic
	Place of management		Authorized to act
	Street of management	Financial documents	Type of document
	Street number of management		Year of the document
Other registrations	Other registrations		

The following table consists of variables that refer to the registration of an investment fund.

Registration of an investment fund			
Categories of data	Variables	Categories of data	Variables
Applicant	Unique identification number	Reserved name	Confirmation number of reserved name
	Name and surname		Date of confirmation of the reserved name
	Phone number	Solution of the Securities Commission	Date of solution of the Securities Commission
	E - mail address		Number of solution of the Securities Commission
	Country	Fund Management Company	Company identification number
	Municipality		Name of company
	Place	Main activity	Main activity
	Street	Form of property	Form of property
	Street number	Contact	Phone number
Basic data	Form of organization		Fax
	Full name		E - mail
	Shortened name		Website address
	Data on the Statute	Data on the executive director	Status
	Contract information / decision on the establishment		Unique identification number
Address of the management - headquarters	State of management		Name and surname
	Municipality of management		Address
	Place of management		Authorization in traffic
	Street of management		Authorized to act
	Street number of management	Data on auditor	Status
Address to receive official mail	Country to receive official mail		Identification number / Unique identification number
	Municipality to receive official mail		Title / Name and Surname
	Place to receive official mail		Headquarters / Address
	Street to receive official mail	Data on the supervisory board	Status of the managing authority
	Street number to receive official mail		Unique identification number
Address of the main place of business	Country of the main place of business		Name and surname
	Municipality of the main place of business		Address
	Place of the main place of business		Authorization in traffic
	Street of the main place of business		Authorized to act
	Street number of the main place of business	Other registrations	Other registrations

The last table consists of variables that refer to the registration of a part of a company. It includes less variables, but similar categories of data to those present in the tables that refer to the registration of an investment fund, part of foreign company, entrepreneurs or a business entity.

Registration of a part of a company			
Categories of data	Variables	Categories of data	Variables
Applicant	Unique identification number	Basic data on the part of a company	Name of the part of a company
	Name and surname	Address of the headquarters of the part of a company	State of management
	Phone number		Municipality of management
	E - mail address		Place of management
	Country		Street of management
	Municipality		Street number of management
	Place	Data on the proxy	Status
	Street		Unique identification number
	Street number		Name and surname
Business entity	Identification number		Address
	Registration number	Main activity of the part of a company	Main activity of the part of a company
	Full name		

From all the listed variables of the Register, in the following table are only the variables that MONSTAT collects from the CRBE at this moment:

Variable
Registration type
Identification number
Unique identification number
The registration number
Name
Shortened name
Registration date
Date of change
Form of organization

Form of ownership
Capital origin
Activity code
Address
Street
Mail address
Street mail
Phone
Fax
E-mail
Web address
The name of the director
Owner's name for entrepreneurs

These variables refer to all five categories (business entities, investment funds, entrepreneurs, parts of companies and parts of foreign companies) of entities that are registered in the Central register of business entities. MONSTAT collects the variables dominantly for the needs of the Department for Statistical Registers and Classifications, more precisely for maintaining the Statistical Business Register.

The CRBE was examined in the context of national needs that also reflect the international recommendations. The variables that potentially relate to economic and geographical characteristics as defined in the international recommendations for censuses are:

- Industry (type of economic activity)

-Location of workplace

The **type of economic activity (Industry)** is a variable that reflects the economic characteristics of persons covered by the census. It essentially refers to the branch of economic activity, that is, to the type of production or activity of an institution or an operational unit in which the main job of an employed person is located, or the last job of an unemployed person.

The variable which in the CRBE refers to the activity is "predominant activity", and it is related to all categories of business entities. This implies the type of economic activity under which a legal entity is registered in the CRBE.

The content of the variables is sufficiently harmonized for the use for statistical purposes, but CRBE includes data on the activities of registered legal entities, while statistical needs concern individual data on activities, or an indication that the activity is performed by a physical person that is covered by the census, and that it is employed or was employed in the past.

It is potentially possible to obtain part of the necessary data with this source, if the administrative data of the CRBE are combined with the Register of taxpayers and insured persons, which provides data on the number of employees. In this way, the number of employees could be classified by activity.

The **location of work** is a variable that according to international recommendations refers to the precise location where an employed person is currently doing his/her job. It is also desirable that the location be encoded in accordance with the precise address and / or geographical coordinates. In case this is not possible, data should be provided at the lowest possible geographical level.

The nearest corresponding variables in the CRBE, in the part of registration of business entities, refer to the "place of management" and "the place of main business". In the part of the registration of the entrepreneur, the potentially relevant variable is the "place of activity", while in the part of the registration of a part of a foreign company, the corresponding administrative variable is the "place of the parent company", "place of management" and "place of main business". The part of the CRBE that relates to the registration of investment funds implies the variables "the place of management" and "the place of the main business", while the part referring to the registration of a part of the company implies the variable "the place of management". All variables refer to the settlement, and the administrative source provides information about the listed variables at street level. However, all administrative variables from the CRBE **relate to registered legal entities**, while according to international recommendations it is necessary to collect data on the location of the workplace that are related to the individual, that is, to the natural person that is included in the census. In this respect, the analysed administrative source is not useful for statistical purposes.

Pursuant to the enumeration form used by MONSTAT during the 2011 census, the variables that are distinguished from the content of the CRBE are "the state in which the person is located", "the activity in which a person performs or has performed a job" and "place of work".

The CRBE collects data on variables related to the address of the person, which covers the state, but refers to the applicant for registration. Other variables in the CRBE refer to the headquarters and the main place of business, but they represent the addresses of legal entities.

The activity in which a person performs or has performed a job relates to data that refers to a natural person covered by the census. In this way, the previous form used for enumeration is in line with the international recommendation, while the administrative variables from CRBE are related to business entities and do not meet the statistical needs in this section.

Similarly, the content of the CRBE and the part of the enumeration form referring to the place of work is not harmonized, which is not in line with the international recommendations of the United Nations. By traditional method of enumeration, the data on the place of work were collected at the level of the municipality and settlements, and refer to natural persons included in the census. The content of the Central register of business entities includes data on the main business, activity, headquarters and management, and are collected at the level of the state, municipality, settlements and streets. As with the previous variables, the problem is that administrative variables of the Central register of business entities refer only to registered legal entities operating in Montenegro.

In addition, it is important to note that the need of MONSTAT is to overcome the problems that occur in the variables related to contact information and addresses. The address issue lacks updating, while it has been identified that variables that relate to the phone number, e-mail address, and fax numbers contain missing or outdated data.

4.2.2. Qualitative analysis

Part of the analysis related to the CRBE involves the creation of a list of variables collected by MONSTAT from the Tax Administration for the production of official statistics.

The data refer to the five categories of entities registered at the Tax Administration – business entities, investment funds, entrepreneurs, parts of companies and parts of foreign companies.

MONSTAT receives data for twenty-two variables contained in the CRBE. The collected variables with their corresponding percentages of completeness values are listed in the table below:

Central register of business entities	
Collected variables	**% of completeness**
Registration type	100 %
Identification number	100 %
Unique identification number	100 %
Registration number	100 %
Name	100 %
Shortened name	100 %
Registration date	100 %
Date of change	100 %
Form of organization	100 %
Form of ownership	100 %
Capital origin	100 %
Activity code	100 %
Address	100 %
Street	100 %
Mail address	100 %
Street address of mail	100 %
Phone number	100 %
Fax	100 %
E-mail	100 %
Web address	100 %
Name of the director	100 %
Owner's name for entrepreneurs	100 %

Qualitative analysis shows perfect results in terms of missing values, because there are no empty fields in this database from Tax Administration. This means that, for the purpose of maintaining the Statistical Business Register, MONSTAT does not need any additional administrative sources of data to collect missing data.

However, the accuracy of received data should be checked. It is noted that address and contact information involve data which are not sufficiently updated. The reason is that business entities have no need to correct the information contained in the Tax Administration, unless it affects their rights or obligations. It is necessary to establish a control mechanism or to use additional data sources in order to regularly check the accuracy of the collected data. In this way, the results of official statistics could be improved in terms of data quality and their relevance for end users.

4.3. Register of Tax Payers and Insured Persons – RTPIP

The Tax Administration is responsible for managing the Register of Tax Payers and Insured persons.

4.3.1. List of variables in the RTPIP – analysis of the content

In the following tables are the variables that compose the RTPIP. They are listed on the basis of application forms of the Tax Administration of Montenegro, which consist of the basic part and three additions (Appendix A- Registration of a legal entity, Appendix B – Registration of a natural person and Appendix C – Records of objects), which are used depending on the purpose of the applicant. The first table refers to the variables of the basic part consisted in the Register of taxpayers and insured persons.

Unique application for registration of taxpayers, contributors and insurers	
Categories of data	**Variable**
Information about the applicant	Type of a person
	Identification number
	Full name / Surname
	Shortened name / First name
Address of headquarters/ permanent or temporary residence	Country
	Municipality
	Place
	Street address and number
	Phone number / Fax
	E-mail
Application supplement	Application supplement
Note	Note
	Tax identification number
	Date of registration

The second table comprises variables present in the Appendix A, which in Tax Administration refers to the registration of a legal entity.

Appendix A: Registration of a legal entity			
Categories of data	**Variable**	**Categories of data**	**Variable**
Address of the principal place of business	Country	Information about the responsible person	Identification number of the responsible person
	Municipality		Last name of the responsible person
	Place		First name of the responsible peson
	Street address and number		Address of the responsible person
	Phone number / Fax	Data on the authorized person	Identification number of the authorized person
	E-mail		Name of the authorized person
Registration	Name of the authority		Address of the authorized person
	Registration date		Termination of authorization
	Registry entry number	Bank account (including international account)	Name of the bank
	Country of origin		Bank address
Other data	Form of organization		Account number
	Form of ownership		Indication of a closed account
	Activity code	Bankruptcy data	Name of the authority
Organizational units	Serial number of the organizational unit		Date of initiation of bankruptcy proceedings
	Name of the organizational unit		Registry entry number
	Municipality of the organizational unit		Identification number of the bankruptcy trustee
	Activity code of the organizational unit		Last and first name of the bankruptcy trustee
	Date of change		Date of conclusion of bankruptcy proceedings
	Termination of organizational unit		
Owner information	Owners's identification number or tax identification number		
	Owner's last and first name		
	Owners's address		
	Percentage of ownership		
	Termination of ownership		

The following table contains variables present in the Appendix B, which refers to the registration of a natural person. This table includes important variables used by MONSTAT.

Appendix B: Registration of a natural person			
Categories of data	**Variables**	**Categories of data**	**Variables**
General data	Identification Number	Registration of insured persons for The Pension and Disability Insurance Fund of Montenegro	Municipality of employment / performance of activities
	Surname		The basis of insurance
	Name		Work time
	Name of one parent		Special information about the insured person
	Maiden name		The basis of termination of insurance
	Date of birth		Date of registration of the insured person in the Pension and Disability Insurance Fund of Montenegro
	Place of birth	Registration of health insurers	The basis of health insurance of a natural person
	Municipality of birth		The basis of termination of health insurance
	Country of birth		Date of registration of the insured person for health insurance
	Gender	Family members health insured on the basis of the insured person	Unique identification number of the family member of the insured person
	Citizenship		Kinship with a family member
	Type of identification document		Surname
	Number of identification document		First name of one parent
	Issued by		First name
	Degree of education		Gender
	Occupation		Date of birth
Address of permanent or temporary residence	Country		Citizenship
	Municipality		Date of acquiring the property of the insured person
	Place		Date of termination of acquisition of the property of insured person
	Street and number	Registration of a taxpayer	Identification number of the authorized person
	Phone number / Fax / E-Mail		First and last name of the authorized person
Registration of a taxpayer	Independent activity		Address of the authorized person
	Name of the registration autority		Indication of termination of the authorization
	Registration date		Name of the bank
	Registry entry number		Address of the bank
	Activity (description and code)		Bank account number
	Identification number of the authorized person		

The last table contains variables collected through the Appendix C, which in the Tax Administration of Montenegro refers to the records of objects. At this moment, they are not needed in terms of statistical purposes, and therefore are not being collected by MONSTAT.

Appendix C: Records of objects			
Categories of data	Variables	Categories of data	Variables
Data on registered objects	Name of the retail store / shop	Data on tax cash registers	Cash register manufacturer
	Address of the retail store / shop		Model - type of cash register
	Phone number of the retail store / shop		Registration number of the cash register
	Activity code		Indication that the cash register is no longer in the facility
	Description of activity		Notes for the tax cash registers
	Type of objects	Data on object's closing	Indication that the object was closed
Data on registration of the object	Name of the authority		Date of closing the object
	Registration number		
	Registration date		

With regard to their definition, variables that are potentially harmonized and could be used for statistical purposes refer **to place of permanent or temporary residence, workplace location, activity, level of education, occupation, country of birth, citizenship** and the **relationship between household members**.

According to the Unique Application for Registration of Taxpayers, Contributors and Insured, the variable **"Place"** refers to the seat of a legal entity, or residence of domestic and foreign natural persons. In addition, there are also variables that refer to the country, municipality, settlement, street and street number in the registration data of a domestic or foreign natural person. However, as previously mentioned, the usual place of residence requires a defined timeframe. The above-mentioned variables that potentially match the concept of the usual place of residence are harmonized with regard to the level of territorial units, but are not appropriate according to the time factor, which is crucial for determining if a natural person is a usual resident of Montenegro during the census.

For the census core variable that refers to the **location of the workplace**, the information is partially accessible from the administrative data of the Register of Taxpayers and Insured persons. Data collected according to the basic form the Unique Application for Registration of Taxpayers, Contributors and Insured also contain variables related to the head office of a legal entity, or residence of domestic and foreign natural persons. The above data is collected for the levels of the country, municipalities, towns and streets, which enables personal data at the lowest territorial level. The coverage is not appropriate, since it refers to the head office of a legal entity, which does not have to be the only address of the business.

If we assume that other administrative sources contain information on the address of the workplace of natural persons, it is possible, by combining them with the RTIP, to obtain sufficient amount of information necessary for the population census, in the part of the so far mentioned core variables.

The **activity** of legal entities can be found in the variable "Activity Code" in the data on the registration of legal entities, in accordance with the Excerpt from the register of classification units.

In the data on the registration of a natural person, the **activity** variable refers to the code and description of the activity. The description is provided by the person submitting the application for registration, while the activity is encrypted according to the Uniform Classification of Activities. This is a **classification that differs** from the Classification of Activities 2010, done on the basis of NACE Rev. 2. With the code and description of the activity, in the data on natural persons there is a variable "Independent activity", which would supplement the data on the activities of natural persons that do not include entrepreneurs and other persons performing self-employment. Also, there are variables related to the code and description of the activity in the part of the records of the objects, but the content of these variables does not correspond to the needs of the population census.

The next core variable refers to the **level of education**, and the problem in collecting data from this administrative sources also relates to the classifications used. In the data on the registration of a natural person, there is a variable "Degree of education", but for this variable, natural persons are not obliged to provide answers.

The use of old and new classifications is not excluded. This differs from the classifications used by MONSTAT that applies the National Classification of Education, in line with the definitions and rules for applying the International Standard Classification of Education - ISCED.

Administrative data on **occupation** from this register refers to a job that a person performs in order to generate income. The data on occupation is provided to the Tax Administration in a descriptive manner, i.e. without a defined classification according to which person states the occupation corresponding to the current state. That is, the person providing the occupation data does not follow a predefined classification, which in this part of the economic characteristics presents a challenge for the register based population census. This implies that MONSTAT should code the classifications based on the person's statements according to the ISCO classifications. For administrative data to be used for the provision of information on occupation, it is necessary to harmonize classifications with the Standard Classification of Occupations applied by MONSTAT, while ensuring international compliance, adhering to the principles and system of the ISCO.

The **country of birth** is the core variable that can be provided for the needs of the population census through the administrative Register of Taxpayers and Insured persons. In the part of the data on natural persons, variables have been identified pertaining to the country, municipality and place of birth of the natural person submitting the application for registration. These variables provide information on the place of birth of a natural person at all territorial levels.

In addition, according to national needs and international recommendations, census includes the core variable **"citizenship"** that is also found in this register. The variable "citizenship", according to the administrative definition, refers to the citizenship status of the natural person submitting the application for registration. In addition, there is a variable on citizenship, which refers to the citizenship status of a family member insured on the basis of the insurance carrier.

Data are checked with data from the Central Population Register, which additionally ensures the accuracy of administrative data on citizenship. In this way, it is possible to use the existing administrative source for collecting data on the citizenship of natural persons, for the purpose of implementing the register based population census but having in mind that it does not cover entire population of Montenegro.

For the purpose of collecting data on **characteristics of family and household**, it is recommended to include in the census the variable "relations between household members". According to the data from the Register of taxpayers and insured persons, it is possible to collect the necessary information through the data in the part of registration of natural persons. However, the administrative source provides the information about the kinship of the natural person submitting the application for registration with the member of the family whose health insurance is based on the insurance carrier. Therefore, this administrative source does not provide data on the kinship of a natural person with all household members. In the part of the data on the registration of natural persons there are variables related to the name of the parent, as well as on the name and gender of the family member who has health insurance based on insurance carrier, but using the mentioned variables will not provide the necessary information about the relationship of a natural person with all household members.

4.3.2. Qualitative analysis

Part of the analysis related to the RTIP involves the establishment of a list of variables collected by MONSTAT from the Tax Administration for the production of results of official statistics.

The data refer to natural persons, that is, only the individuals who are employed. In the Tax Administration, data on employees are created in accordance with the Uniform Application for Registration of Taxpayers, Contributors and Insured, together with completed Appendix B, which refers to natural persons. Regarding the taxpayers, MONSTAT receives twelve variables from the Tax Administration. Taking into account national needs, as well as international recommendations

for the census, administrative variables of importance only refer to the **country** and the **municipality**.

According to the form for enumeration of persons used for the 2011 census, the name of the country and municipality are variables that can be used for statistical purposes according to the administrative register of the Tax Administration in the part of the taxpayers. What is important is that there are no missing values for these variables. That is, databases are complete with regard to the country and municipalities that are related to individual taxpayers, but there is no information about settlement.

List of variables on taxpayers collected MONSTAT from the Tax Administration

Taxpayers	
Collected variables	**% of completeness**
Identification number of taxpayers	100 %
Identification number	100 %
Country code	100 %
Country name	100 %
Municipality code	100 %
Municipality name	100 %
Code of form of ownership	87.95%
Form of ownership	87.95%
Code of form of organization	88.18%
Form of organization	88.18%
Activity code	99.60%
Status	100%

On the other hand, variables related to the form and ownership code, as well as the form and organization code, contain a certain percentage of the missing values. The share of empty fields for some variables is around 12.00%. These percentages are not negligible, but still represent a relatively positive indicator allowing MONSTAT to use the Tax Administration's administrative register as a source of data to meet the needs of official statistics.

The second part of the analysis of employees relates to the insured persons, so MONSTAT, according to its needs, collects 27 variables from the Register of taxpayers and insured persons. In this section, a greater share of empty fields for the collected variables was observed. Variables that are relevant to the census refer to the municipality and country of birth, citizenship, education, occupation, municipality and residence.

For the **municipality of birth** the share of empty fields is 11.60%. The percentage is not negligible, but the administrative variable remains an important resource for obtaining information about the characteristics of this group of population. It can be noted that there is a higher percentage of empty fields in the part of the variable referring to the code of the municipality of birth, but these are the codes that were used by MONSTAT, so it is possible to solve the problem of the missing codes by importing the code for each missing value variable, or connect it with the corresponding names of the municipalities. A more positive result is noticeable for the variable **country of birth**, for which has been found to have no missing values in the part of the country's name and code.

Also, the variable that is important for the needs of the census refers to **citizenship**. In this section, a similar percentage of empty fields is noted, which is not negligible, but it remains an important source for obtaining citizenship information. Citizenship is a variable that is part of more administrative registers and records, and consequently there is a possibility to use additional data sources in order to collect data on citizenship for the entire population.

List of variables on insured persons collected by MONSTAT from the Tax Administration

Insured persons	
Collected variables	**% of completeness**
Identification number	100 %
Unique identification number	100 %
Date of birth	100 %
Municipality of birth - code	80.03 %
Municipality of birth	88.40 %
Country of birth	100 %
Country of birth - code	100 %
Gender	100 %

Citizenship	88.36 %
Professional education - code	**55.93 %**
Professional education	**55.93 %**
Occupation - code	**36.28 %**
Occupation	**36.28 %**
Serial number of the organizational unit	**0.03%**
Work time	100 %
The basis of insurance in the Pension and Disability Insurance Fund	100 %
Code of the reason of termination of insurance in the Pension and Disability Insurance Fund	**0.01 %**
Reason of termination of insurance in the Pension and Disability Insurance Fund	**0.01 %**
The basis of health insurance	100 %
Code of the reason of termination of health insurance	**0.01 %**
Reason of termination of health insurance	**0.01 %**
Municipality code	100 %
Name of the municipality	100 %
Name of the residence	99.68 %
Residence - code	99.68 %
Name of the municipality of employment	99.93 %
Code of municipality of employment	99. 93%

Other variables that are listed in the data on the insured persons, and are required for the census, are related to **occupation and education**. As stated in the part of the analysis of the Register of taxpayers and insured persons, the content of the variables in the definition and classification section is problematic in terms of usage for the needs of the population census. However, the problem is also reflected in qualitative terms - 63.72% of the values are missing for the occupational variable, while for the variable referring to the professional education, 44.07% of the values are missing.

These indicators are not only negligible, but also reflect the state that the analysed administrative source is not sufficient to collect data on occupation and education and their use for statistical purposes, so at least one or more additional data sources need to be used to cover the whole population.

More positive results are evident for variables related to the name of the municipality and residence (mjesto prebivališta). Municipal information is basic data collected from natural persons by

various state and state administration bodies, but residence (mjesto prebivališta) is a variable for which it is particularly important to provide data, taking into account that it is not a variable that is part of many administrative registers analysed. However, according to the administrative methodology, the place of residence does not imply a time factor, and from the qualitative aspect, the content of the mentioned variable for the needs of the population census is not entirely relevant.

For some variables that are not part of the form for enumeration of persons, a positive result is evident in terms of missing values, where the percentage of empty fields is non-existent. These are variables that can be used to connect databases, as well as variables that match the different needs of official statistics. On the other hand, it is evident that there are almost no values related to the reason for the termination of keeping records on a natural person in the Pension and Disability Insurance Fund and the Health Insurance Fund, which does not directly affect the population census, but shortens the possibility of identifying persons as residents of Montenegro according to the concept of the usual place of residence, because according to social, pension, disability and health insurance it can be determined whether a person is present in Montenegro for at least a year.

In accordance with the above, it can be concluded that from the qualitative aspect, the Register of taxpayers and insured persons is partially sufficient source of data needed for the population census. In the part of data relating to municipalities and countries, the content and the persistence of data correspond to statistical needs. Some of the variables recorded too high percentages of missing values, while at the same time do not provide adequate definition and classification, such as the education and occupation variables. On the other hand, for some variables such as residence (mjesto prebivališta), the problem is not the empty fields, but in terms of compliance with the concept of the usual place of residence.

For these reasons, it is possible to use the Register of taxpayers and insured persons to collect data, but it is also necessary to access data from other sources, in order to provide greater coverage, adequate content and sufficient data for the inclusion of the entire population of Montenegro, but also to identify all the characteristics of the population studied.

In addition to the analysed state of the Register of taxpayers and insured persons, it is important to emphasise that for the purposes of MONSTAT, it would be useful to introduce a new variable, "Type of contract" in the tax administration form for collection of data[2]. Also, it is necessary to reduce the number of incorrect classifications and to synchronise them with the existing official classifications. Delivered codes are often five-digit, which is in accordance with NACE Rev. 1 classification of activities. However, it is necessary to fully use the four-digit codes, which are in accordance with NACE Rev. 2 classification, for which the Tax Administration of Montenegro is competent.

4.4. Register of Number of Children in Education - NCE

Ministry of Education, owner of the Register of Number of Children in Education has created a Montenegrin Education Information System (hereinafter: MEIS) which radically improved database on pupils and education system in the country. It is a real-time database, since it is updated upon each entry. MONSTAT uses a significant number of data from MEIS for national and international reporting as well as for ad-hoc requests.

4.4.1. List of variables in NCE – analysis of the content and qualitative analysis

Montenegrin Education Information System (MEIS) keeps records on:

- Pupils,
- Teaching subjects,
- Employees,
- Professional and administrative bodies of educational institutions,
- Building facilities,
- Investments,

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[2] This variable is of great importance for the colleagues working with the Labour force statistics for their current needs in production of the official statistics.

- Equipment.

For Census it may be beneficial that MEIS has records on individual level but some problems are noticed. MEIS was disconnected from the Central Population Register for some time. This disconnection made possible the entry of some incorrect personal data (personal ID, sex, date of birth etc.), since control mechanism was missing. For example[3], it was noticed that **sex of pupils** does not correspond to the ID numbers in 1.1% of cases while for **sex of school employees** discrepancies exist in 0.2% cases. In addition, it was noticed that **date of births of pupils** does not correspond to the IDs in 1.3% while **date of births for school employees** does not relate properly to IDs in 0.5% cases.

So far, MONSTAT did not require precise address of pupils and employees and therefore this variable was not provided (only "place of residence" – mjesto prebivališta), but these data are collected in MEIS and could be valuable for census. Up until now, address is collected based on the parent's statement. However, there was a plan for this data to be withdrawn from the CPR instead. According to the MONSTAT's request, representatives of the Ministry of Education agreed to create two address fields and that the logs of the last update should be submitted when needed. In this way, MONSTAT will have more up-to-date data on addresses at their disposal. In addition, MEIS is able to provide data on particular date, defined by MONSTAT, which could be very useful for Census regarding census reference moment.

MEIS, as all other registers, has its deficiencies. The biggest shortcoming is that it does not cover at all the tertiary education. Part of the data for this level of education are collected through the MONSTAT's research. Namely, for some private universities individual questionnaires are completed by students and these are sent to MONSTAT. Another important lack of MEIS is data missing on school finances. It seems that school finances are complicated matter to be standardized in the application at this moment. Also, MEIS does not contain data on education of adults.
Based on signed agreement between MONSTAT and Ministry of Education, the variables that are provided to MONSTAT are the following[4]:

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[3] Analysis is performed on the Enrolment 2018/2019 on pupils and employees
[4] Detailed analysis of each variable with articles from the Law are provided in the separate Excel document.

Variable	Explanation/Comments	Quality data
Municipality	Municipality of school location.	**100% completeness.** **No mistakes.** This is set by Ministry of Education for each school.
ID Municipality	Municipality ID numbers in Montenegro defined by Monstat.	**100% completeness.** **No mistakes**. This is set by Ministry of Education for each school.
Educational institution	Full name of school	**100% completeness.** **No mistakes.** This is set by Ministry of Education for each school.
Type of institution	Type of education institution: - Preprimary - Primary - Higher education - Educational center	**100% completeness.** **No mistakes.** This is set by Ministry of Education for each school.
Type of school ownership	- Private - Public - Private Public Partnership	**100% completeness.** **No mistakes.** This is set by Ministry of Education for each school.
School unit	Identifies part of school where pupils study since some schools have main unit and branches.	**100% completeness.** Mistakes are not likely.
Type of educational center	The variable describes type of educational center. For example, if some school has kindergarten or it is school for musical education. - Music education school - Kindergarten - Resource school - Blanks	100% completeness though blanks refer to regular schools. **No mistakes.** This is set by Ministry.
State/Private owned	Property type (state, private or private-public partnership). The same as **Type of school ownership** variable.	
Pupil's unique number in MEIS	Unique number assigned in MEIS	**100% completeness.** **No mistakes.** This is set by Ministry of Education for each pupil.

Unique personal identification number	This used to be connected to Central Register. Due to technical problems, this is not linked to Central Register anymore. Instead, it is entered by teachers in electronic diaries. Teachers are asked to treat this entry with additional care. Wrong ID number would lead to wrong ID on final school diplomas. Those pupils that don't have IDs are given in system IDs starting with zeros.	**100% completeness.** 1.3% of values may not be correct. First 7 digits of ID refer to date of birth (dd/mm/_yyy). Therefore, it was possible to compare date of birth to first seven digits of ID number. It was noticed that 1.3% have differences. If we exclude ID values which have two first digits that are not logical (since this should be day in month), there are 0,6% of data that have difference between first 7 digits of ID and data of birth. But, we cannot be sure if the mistake is in ID or date of birth.
Date of birth of pupil	This used to be connected to Central Population Register. Due to technical problems, this is not linked to Central Register anymore. Instead, it is entered by teachers.	**100%completeness.** 0.6% of values may not be correct. First 7 digits of ID refers to date of birth (dd/mm/_yyy). Therefore, it was possible to compare date of birth with first seven digits of ID number. It was noticed that 1.3% have differences. If we exclude ID values which have two first digits that are not logical (since this should be day in month), there are 0,6% data that have difference between first 7 digits of ID and data of birth. But, it cannot be sure if the mistake is in ID or date of birth.
Age of pupil	This is calculated by Ministry of Education in the following way: Year of report minus year of birth.	**100% completeness.** Quality of data depends on quality of entry of year of birth.
Pupil's residence	This used to be connected to Central Register. Due to technical problems, this is not linked to Central Register anymore. Instead, it is entered by teachers.	**90.9% completeness.** Apparently there is no standard in writing residence places. For example, same place has been registered in following way: - Arbneš - Arbneš,Bar - Arbnes,Bar-Tivar - Arbneš-Arbnesh, Bar-Tivar - Arbnesh

Sex of pupil	This used to be connected to Central Register. Due to technical problems, this is not linked to Central Register anymore. Instead, it is entered by teachers.	**100% completeness** but if entry is skipped, than value is "male" by default. Data are entered by teachers. Mistakes could be identified by comparing sex to the digits in ID number that refer to the sex. Namely, in 1.09% cases digits of ID number do not correspond to appropriate sex. If IDs that start with illogical numbers are excluded (those that could not be date), percentage of those cases that do not correspond to appropriate sex is 0.76%.
Way of enrollment	Whether student attends school regularly or takes exams at the end to complete year. Actually, only those who attend school regularly are in the MICE. When someone stops going to school, s/he is being removed from the system.	**100% completeness.** **No mistakes.**
Grade	There are grades in regular schools and grade in schools for pupils who require special needs.	**100% completeness.** **No mistakes.** It is not possible to mark pupils if they are in wrong grade.
Unique identification number of class	ID number set in MEIS.	**100% completeness.** **No mistakes.**
Population of the Roma, Ashkali and Egyptian	This data is entered by teachers: - RAE from ex-Yugoslav republic - RAE domicile - RAE from Kosovo - Blanks Sometimes, RAE population doesn't like to be registered as such unless they could claim some benefits.	This is entered by teachers, as such, mistakes are possible. It is hard to check quality and completeness of these data since if value is "no RAE" it is not entered.

Citizenship of pupil	This used to be connected to Central Register. Due to technical problems, this is not linked to Central Register anymore.	**99.8% completeness.** This is entered by teachers, as such, mistakes are possible. All those without citizenship are RAE population (seen from RAE variable).
Refugee	- No - Yes	**100% completeness.** This is entered by teachers, as such, possibilities of "YES" omission are possible.
It has confirmation on disabilities	This is confirmation that it is student with mental or physical disabilities: -No (it doesn't have decision) -Yes (it has decision).	**100% completeness** This is entered by teachers, as such, mistakes are possible.
Extended stay in school	If pupil goes to extended stay in school: - All day stay - Half day stay - Blanks.	Since blank means that pupil is not using service, calculating completeness could not be performed. This is entered by teachers, as such, mistakes are possible.
Repeated grade	If someone fails the year then repeats the same grade, or goes to even lower grade in cases they are changing vocation. -No -Yes.	**100% completeness.** No mistakes. This is checked and processed by Ministry of Education.

ISCED Level	Level of education according to the International Standard Classification of Education According to the Montenegrin system of education ISCED levels are assigned in the following way: ISCED 0- preprimary school ISCED 1 - grade 1 to grade 5 ISCED 2 - grade 6 to grade 9 ISCED 3 - secondary school ISCED 4 - higher education but not faculty ISCED 5 - 2 years studies after secondary school ISCED 6 - 3-4 years of university studies ISCED 7 - 5-6 years of university studies ISCED 8 - PhD studies	**100% completeness.** No mistakes. This information is assigned by Ministry of Education for needs of Monstat. They don't have it in the system as such, but modify it for report purposes.
Age of school employee	This is calculated in following way: year of report- year of birth	**100% completeness.** **Mistakes are noticed.** This is calculated by Ministry of Education. Quality of data depends on the quality of date of birth entry and few mistakes are noticed (compared to first 7 digits of ID). These entries are done by school management.
Sex of school employees		**100% completeness.** These entries are performed by school management. Comparing it to ID numbers it was noticed that 0.22% do not correspond to the ID digits that refer to sex. If illogical IDs are excluded that percentage drops to 0.03%.
Groups of jobs	Different work positions are grouped by Ministry of Education. No specific rule on this. They did it for their own needs.	**99.99% completeness.** Quality of data depends on the quality of entry of Job title variable.
Job title	Exact name of the work position of school employees.	**100% completeness.** Data entry is done by school management. It is hard to check correctness.
Contract type	Type of work contract: - Part-time - Main (Employment contract) - Additional work - Supplementary work - Vocational training	**100% completeness.** Data is entered by school management. It is hard to check data quality. Ministry of Education checks it from time to time but they cannot claim it is 100% correct.

Working status	This variable gives more information on current work activity of school employees: - Regular activity - Maternity leave - Pregnancy leave - Sick leave - Suspended - Temporary restrain - Unpaid leave - Redundant - Disabled - Overtaken by other school	**99.88% completeness.** It is hard to check data quality. Entry is performed by school management.
Shortened working hours	Working hours employees work: - Regular working hours - Half working hours - More than half working hours - Less than half working hours	**94.8% completeness.** Entry is performed by school management, omissions and mistakes are possible.
Unique identification number of school employees		**100% completeness.** Data is entered by school management. There are discrepancies between date of birth and first seven digits of ID in 0.50% cases. When illogical IDs and those that are not Montenegrin citizens are excluded than there are discrepancies in 0.41%.
Date of birth of school employee		**100% completeness.** Data is entered by school management. There are discrepancies between date of birth and first seven digits of ID in 0.41% cases when illogical IDs and those that are not Montenegrin citizens are excluded.
Date of birth of school employee		**98.5% completeness.** Data entry is done by school management. No standard in writing down the names of places: -Dečani, Andrijevica -Dečani,Andrijevica
Country of birth of school employee	These data have been provided in 2015/2016 data package but not afterwards.	**99.95% completeness.** **Data entered by school management.**
Residence of school employee	This information is provided by employees themselves but no official paper is submitted to schools.	**93.8% completeness.** Data entered by school management based on the employee statement. There is no standard in writing places: -Dobrota Kotor -Dobrota, Kotor -Dobrota,Kotor

School employee who belongs Population of the Roma, Ashkali and Egyptian	-RAE from ex-Yugoslav republic -RAE domicile -RAE from Kosovo -Blanks	Blanks refer to employees that are not RAE, therefore it is hard to identify if value omission occurred.
Citizenship of school employee		**99.86% completeness.** Data is entered by school management.
Employees qualifications	Values of the variables are: I1, I2, IV1, IV2, V, VI, VII1, VII2,VII	**99.55%** **Mistakes are noticed.** Some teachers and school management seem to have only primary school. Data entry is done by school management.
Vocational exam	The exam teachers take the latest one year after starting teaching job. Sometimes, it is condition to get a teaching job. These data have been provided in 2015/2016 data package but not afterwards.	**97.16% completeness.** Entry done by school management. Years of working experience are inconclusive to check for correctness of data.
Type of work contract	Permeant contract / Temporary contract	**98.56% completeness.** Data entered by school management.
Ratio for calculating salary of school employee	School accountant calculates ratio. These data have been provided in 2015/2016 data package but not afterwards.	**99.98% completeness.** Entry is performed by school management. One value is missing 0.05% and one is obviously mistaken which is 0.05% of total cases.
Number of classes teachers have in a month	These data have been provided in 2015/2016 data package but not afterwards.	**87.84% completeness.** Data entered by school management. 3 mistakes are noticed which make 0.12% of total cases value.
Number of classes teachers have in a week	These data have been provided in 2015/2016 data package but not afterwards.	**97.53% completeness.** Data entered by school management. Some mistakes are noticed which make 0.37% of total cases.

4.5. Criminal Records Register - CRR

Criminal Records register is under the jurisdiction of the Ministry of Justice and refers to the criminal records of natural persons.

4.5.1. List of variables in the CRR – analysis of the content

According to The Decree on the Instructions of Keeping a Criminal Record, collected data on criminal offenders are:

  1) personal data:

   - personal name (name and surname), and maiden name for married women, nickname and fake name, if any, sex, date, place and country of birth, father and mother's first and last name, mother's maiden name,

   - unique identification number of persons (JMBG),

   - citizenship,

   - profession,

   - address;

  2) information about the judgement:

   - name of the court,

   - the number of the judgment,

   - the day of publishing the pronounced judgment and the date of the validity of the judgment or decision of the higher court if the decision of the first instance court was changed by that decision, and for the judgments of a foreign court the name of the country;

  3) information on the criminal offense:

   - the legal title of the criminal offense, with the indication of the article of the law that was applied and the date of execution of the criminal offense;

4) data on penalties and other measures:

- type and severity of the sentence, type and duration of the security measure and all changes in relation to such data, decision on exemption from punishment, data on the spent, obsolete or forgiven sentence, date of paid fines;

5) data on the change of judgment:

- correction of the judgment,

- data from decisions on extraordinary legal remedies,

- data on the replacement of unpaid fines with imprisonment,

- data on conditional release, amnesty and pardon,

- data on revocation of conditional sentence or conditional release.

The Register is updated on a daily basis (new offenders are entered in the records) at the exact moment when new information is received. Updating is not automatic through the system but by typing from paper forms.

It has been planned to improve the quality of the data in the Register, although this will require the opening of a large number of physical files. In addition, there are a number of advancements ongoing in the Ministry of Justice that are related to information flow, technical and administrative changes. These changes comprise the integration of all registers from the judicial system of Montenegro. A database will be established for each institution within the judicial system and a unique channel through which they will be linked with other relevant external institutions.

Registers that will be connected through this system, among others, are Register of fines, Register of criminal and misdemeanour records of legal entities, Register of decisions for monitoring conditional release, Register of court experts, Register of notaries, etc.

By developing a new system for the judicial and a new criminal record system, the use of paper documents will be kept to a minimum. Under this system, when a final judgment is made in court, the data will automatically be updated in the system. By implementing a new judicial information system, it will be possible to obtain all data in one place, which was now available only by

searching paper files. It will not be easy to switch to a new system, because there are a large number of "live" cases.

At this moment, MONSTAT has no current use or requirements for data contained in the Register on criminal records. However this register when combined with others from judicial system of Montenegro could serve as one of the registers for testing the "signs of life"[5].

4.6. Register of Unemployed Persons – RUP

4.6.1. List of variables in the RUP – analysis of the content

The Employment Agency of Montenegro maintains two types of records of unemployed persons, depending on whether the subjects are domestic or foreign persons registered as unemployed. The variables enclosed in the mentioned records are listed below, classified by the type of the record of unemployed persons. First table refers to the unemployed Montenegrin citizens.

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[5] In register-based statistics one of the means of avoiding coverage errors is to create a residency index on the basis of the records held in multiple registers in order to determine a so-called 'signs of life' score. The approach is to define for all possible residents the 'sign of life' as a binary score (with a value 0 or 1) for each record in each register.

Records of unemployed persons	
Variables	**Variables**
Surname and name	Number and kinship of members of the common household
Identification number	Average amount of personal income per member of the common household
Gender	The size of the land property of the unemployed person, or members of the joint household
Date and place of birth (place, municipality, country)	Type and reasons for difficult employment
Permanent or temporary residence (municipality and address of the apartment)	Professional and economic motivation for employment
Previous permanent or temporary residence (municipality)	Readiness for employment outside the permanent residence
Marital status	Data on mediation and mediation results when employing an unemployed person
Military obligation	Time of use of the right to monetary compensation during unemployment and the right to financial assistance for time of vocational training
Date of application to the regional unit of the Employment Agency of Montenegro, where is person's permanent residence	Amount of monetary compensation
Occupation (title, code and work experience in occupation)	Establishment of a working relationship of a person on the record (date, place, type of employment and manner of employment)
Type and degree of education	Date of cessation of record keeping
Special knowledge, skills and knowledge of a foreign language	Reason for cessation of record keeping
Years of service	

The following table contains the main part of the database for unemployed foreigners, listing the variables that are present in the records of foreign unemployed persons.

The records of unemployed foreigners in Montenegro	
Variables	**Variables**
Citizenship	The records of unemployed foreigners in Montenegro contain all the variables from records of unemployed persons, along with three additional variables listed in this table
Work permit	
Approved permanent residence on the territory of Montenegro	

Since the Employment Agency is not responsible for the entire administrative register on Employment, but for administrative records containing fewer variables in relation to the Register of taxpayers and insured persons, and in relation to the Central Population Register, it is surprising that an important number of variables has been initially recorded, that potentially correspond to the international recommendations and national needs for population censuses.

The records on unemployed persons contain the variable **"marital status"**, which refers to the marital status of the unemployed person. When registering a person as unemployed at the Employment Agency of Montenegro, it is not necessary to use documentation confirming the marital status of a person, but assuming that the information provided is correct, the marital status is legally regulated according to the Family Law. This confirms the compliance of the content of the variable with the needs for the population census. However, the records on unemployed persons only include data on marital status for persons registered as unemployed in the Employment Service. For this reason, it is possible to use the variable "marital status" as part of the necessary data that are intended for the collection through population censuses, while additional data sources need to be used to cover the entire population in the territory of Montenegro.

The variable **"number and kinship of members of the common household"** is a part of the Record of unemployed persons, which can substantially correspond to the core variables relating to "relationships among household members" and "the size of private households". The variable from the RUP refers to the number of members in the household whose member is an unemployed person, as well as the kinship of the unemployed person with all members of the joint household. Relations among household members, in accordance with international recommendations, relate to the information for all persons living in a private household and define the mutual relations of the members of that household.

On the other hand, the size of a private household refers to the total number of household members according to which the size of the household should be classified. As for the variable "marital status", the variable "number and kinship of members of the common household" is in line with international recommendations and national needs for population census, but it represents only part of the data of the required variable. The records on unemployed persons provide only data on persons registered as unemployed at the Employment Agency, while relations among the household members must be recorded regardless of the working status of the respondents. In addition, the records of unemployed persons provide data on the kinship of the unemployed person with other members of the household, but not about all relations that are present among the members of the common household.

Regarding the **number of members of the joint household**, the records on unemployed persons provide data that are in line with the international framework, but also relate only to households where a person is registered as unemployed. For these reasons, it is necessary to use additional data sources in order to cover the whole population and collect the necessary data when conducting a population census.

The variable **"date and place of birth"** is part of the Records of unemployed persons, and in one part it corresponds substantially to the core variables "country of birth" and "place of birth". The records of unemployed persons include data relating to the country, municipality and place, or settlement of birth. On the other hand, the country of birth according to the international

recommendation refers to "the country in which the birthplace is located", while the place of birth is defined as "the geographical unit in which the birth occurred or the usual place of residence of the mother at the time of birth". If we look at the place of birth, that is, information on the settlement contained in the Records of unemployed persons as a geographical unit, then the administrative variable is adjusted in terms of content, but again, not in terms of coverage of the entire population.

Pursuant to the Records of unemployed persons, the variable **"permanent or temporary residence"** refers to the municipality and address of the housing unit to which the unemployed person is registered. As with the Register of taxpayers and insured persons, but also with the Central Population Register, the administrative data on the place of permanent or temporary residence do not have information about the length of stay at the registered address, as well as information on the intention of a natural person to inhabit or leave the place of residence in the future. Therefore, it does not adequately meet the needs of the population census, based on the concept of the usual place of residence. Moreover, it only concerns unemployed persons, a sub group of the Montenegrin population.

The variables **"Permanent or temporary residence"** and **" Previous permanent or temporary residence"** which in the database are encoded together with the date (the date when a person made a change in the residence status)**,** could be of a great use for statistical purposes **if** natural persons report changes of personal data concerning their residence/address. According to the census recommendations, this variable could provide information on geographic and time patterns of migration to the current place of residence. It is advisable to identify the previous place of usual residence at the lowest territorial level. Date of arrival at the current place of residence refers to the year and month of arrival, and the information could be used to measure the long-term and short-term internal migration of, at least, unemployed persons.

However, the variable **"previous permanent or temporary residence"** refers to the municipality which was the former permanent or temporary residence of the unemployed person. The

administrative variable does not provide data at settlement level, so territorial coverage is not met in terms of international recommendations. Also, the administrative methodology covers only persons registered as unemployed at the Employment Agency.

The records of unemployed persons contain a variable **"type and degree of professional education"**, which potentially corresponds to the content of the core variable "education level". According to the methodology of the register, the type and degree of professional education refers to the level of education of the unemployed person, which is the information provided on the basis of the statement of the person. In addition, a change in the educational system is not taken into account, which has led to the use of old and new classifications of this variable. In other words, there is no standardized classification of education which has been applied by the Employment Agency.

Citizenship is a core variable that has been examined in other administrative sources of data. The Employment Agency does not provide enough relevant data in comparison to the Tax Administration and the Ministry of Interior, since the data are collected for the purpose of registering unemployed foreigners in Montenegro. This does not include even all unemployed persons registered at the Employment Agency, but only foreigners who do not have a job and actively seek employment in Montenegro. For this reason, it is insufficient to use records of unemployed domestic and foreign persons in Montenegro for collecting citizenship data when conducting a population census.

It should be noted that all variables examined from the Records of unemployed (domestic) persons are included in the Records of unemployed foreigners in Montenegro. This means that it is also possible to obtain data on marital status, household, occupation, level of education and residence of unemployed foreigners in Montenegro, which may be useful for statistical purposes, but there is still a need for using additional sources in order to collect all the necessary data envisaged by the population census. The coverage of population is higher, but still only refers to persons who are registered as unemployed.

Initially, it was considered that the greatest utility of administrative data collected by the Employment Agency is in the records of the status of unemployment, because it includes a basic, core variable that provides the necessary information about the employment of persons, while on the other hand represents a variable that is not only a reflection of international recommendations, but also national needs that are met by the population census. However, the inability to use this administrative variable for statistical purposes is a consequence of essential differences between administrative and statistical methodologies - In 2013, MONSTAT and the Employment Agency formed a Work Group for the preparation of a Manual on how to determine the surveyed and registered unemployment rate. The aim was to present methodological differences in the calculation of the unemployment rate, which is measured according to the administrative and statistical methodology. These are the survey unemployment rate, which is obtained on the basis of the Labour Force Survey (surveys carried out by the Statistical Office in accordance with the Law on Statistics and Statistical System of Montenegro), as well as the registered unemployment rate, measured by the Employment Agency based on the collection of administrative data, in accordance with the Law on Records in the field of labour and employment. The mentioned concepts of unemployment differ in terms of definition, frequency and relevance, as well as their role and purpose. The conclusion of the Work Group is that none of the concepts can be replaced by the other. While the Labour Force Survey provides quarterly and annual estimates for residents in Montenegro, it also provides information on important socio-economic characteristics of the population, such as gender, age and education, as well as occupation, economic activity and other variables.

Data on working engagement are also used according to the administrative and statistical methodology for persons of at least 15 years of age, but administrative data reflect administrative needs, while the Labour Force Survey is conducted in accordance with the standards and recommendations of the International Labour Organization, as well as bodies of the European Union. In this way, sampling procedures, questionnaire design, employment and unemployment definition adopted by MONSTAT were established.

Methodological differences also refer to the variable of occupation itself, so the Employment Agency does not use a standardized classification of occupations, such as the International

Standard Classification of Occupations applied by MONSTAT. In addition, in order to make administrative data relating to occupation relevant to statistical purposes, the problem of data updating should be solved. The change in occupation is not often recorded at the Employment Agency, but it still applies only to persons registered as unemployed.

4.6.2. Qualitative analysis

In the previous section, analysis has established that there are essential methodological differences in the collection, definition and classification of variables that are of significance for the census. The qualitative analysis aims to determine which variables MONSTAT collects from the Employment Agency, as well as to evaluate the occurrence of empty fields for the listed variables.

From a qualitative point of view, the results are satisfactory, if we consider the percentage share of empty fields. There are no missing values for the variables collected by MONSTAT from the Employment Agency.

List of variables collected by MONSTAT from the Employment Agency

Data on vacancies	
Collected variables	**% of completeness**
Employer	100 % - the source does not contain missing values
Identification number of an employer	
Activity code	
Activity of an employer	
Number of employees	
Number of perpetrators	
Code of the municipality	
Municipality of work	
Searched occupation	
Work place	
Date of registration	
Number of registration	

Ad date	
The duration of the ad	

Nevertheless, the number of employees is an aggregate view of the labour market situation in Montenegro, while more important data should be presented at the individual level in order to gather information on the economic characteristics of all persons included in the population census. On the other hand, the compliance of administrative and statistical methodology with regard to activity is relative - data on activities relate only to the employer, which indicates that there is not a large number of persons for whom data are to be collected.

From a qualitative aspect, the relevance of certain variables for statistical purposes is possible, referring to the records of unemployed persons. However, analysis has determined the existence of methodological differences in the definition and classification of variables that are of great importance for the census, while the qualitative aspect of the data still not collected by the MONSTAT from the Employment Agency is unknown.

For these reasons, it is necessary to use also additional administrative sources in order to collect relevant data for the needs of the population census, in order to provide the statistical product with information on the economic as well as other characteristics of natural persons included in the census.

4.7. Cadastre Register

Cadastre register (hereinafter: Cadastre) contains data on real estate, legal right holders of the real estates, real rights and the legal status of the real estate. These data are permanently stored in the database or displayed in the cadastral system.

4.7.1. List of variables in the Cadaster Register – analysis of the content

The Cadastre is organized in the following way:

-**Land** is marked with the number of cadastral parcels within the cadastral municipality. The number of cadastral plots includes the potential sub-number separated by a slash, in cases when additional detail will improve identification.

- **The land under the building**, as part of a cadastral parcel, is marked by the same ordinal number as building.

-**The building** is marked with a cadastral parcel number and an ordinal number of the building within the cadastral parcel.

-**A special part of the building** is marked with the ordinal building number and ordinal number of the special part of the building within the building.

The best way to see what information cadastre contains are through the land registry that are usually issued by searching plot number within certain municipality and cadastre municipality or by identification number of the legal right owners. The land registry is consisted of four sections, each referring to group of data:

- A section – data on a cadastral plot;

- B section – data on holders of legal right and property usage;

- V section – data on buildings, special parts of buildings holders and ownership rights on them;

- G section – data on burdens, restrictions and certain legal statuses on immovable (for example construction without permits or their exceedances, etc.).

In the **A-section** of the land registry there are:

1) number and sub-number of the parcel;

2) number of part on the plot;

3) number of plan and drawing;

4) the route or street and the house number;

5) usage purpose and cadastral classification of land;

6) solvency,

7) the legal ground for obtaining right on the property;

8) area in m²;

9) cadastral income;

10) type of land;

11) statistical area;

12) list of changes in the land registry.

B section contains following data:

1) the ID number of the natural or legal person,

2) surname, name, name of one parent, place of residence and address, or name, seat and address

3) type of legal right on the property,

4) form of ownership,

5) the scope of the legal right.

V section of the land registry contains:

1) the number of land parcel with the number and sub-number;

2) the number of the parcel plot under the building;

3) total number of floors of the building;

4) floor number;

5) useful area in m²;

6) the legal status of the building;

7) entrance number;

8) usage purpose;

9) how the legal right has been obtained;

10) number of rooms;

11) for the legal right holders on the immovable:

- the identification number of the natural or legal person

- the surname, the name and the name of one parent, the residence, the address, or the name of the headquarter residence and address.

12) type of legal right;

13) form of ownership;

14) the scope of the legal right.

Drawings and sketches are also part of the V section.

In the **G section** of the land registry following data are found:

1) number of parcels with number and sub-number;

2) the number of the building on the plot;

3) the number of the special part of the building;

4) the usage purpose;

5) ordinal number of the legal burden;

6) type of legal burden, restrictions and description of the burden;

7) ordinal number of burden registration;

8) date of burden registration;

9) the date of burden deletion.

MONSTAT currently does not use any data from the Cadastre. The way it is organized makes it unsuitable for statistical usage needed to MONSTAT. However, Cadastre will be useful once the Address register is finalized. The development of Address register is responsibility of Real Estate Directorate who is also in charge of the Cadastre. The Address register is very important for the Census of population, households and dwellings, both for the traditional and register based census. For MONSTAT, it is important that the address, in accordance to the new Address register, marks properties up to the level of the housing units, i.e. up to the level of special parts (PD) according to the current organization of Cadastre.

Special part refers to apartments, business premises, basements, garages i.e. parts of the buildings that represent, by spatial organization and its way of use, individual unit. Each residential building that has more than four special parts, has to be elaborated up to the level of separate special parts. It has not yet been determined what will be the unique PD identifier in Address register but it could be some complex code that will contain the municipality, cadastral municipality, number of parcel, sub-number, building number and special part number. The number of apartment is marked for each building entrance separately (for purpose of geographical orientation) while the special parts are marked per building. Based on the property's purpose of use registered in the Cadastre, there is a possibility to calculate the number of housing units per building which could also be useful statistical information.

Once the Address register is created up to the level of apartments, and the addresses are applied in the Central Population Register, it will be easier to establish a connection with other registers that also require addresses. For example, it will be possible to calculate who exactly lives on particular address i.e. how many members live on particular address.

Nevertheless, even if the data is not used for the production of official statistics on everyday basis, Cadastre already contains some variables that can only be found in that register and that are of utmost importance for the census. Some of those variables are: area in m², form of ownership, total number of floors of the building, useful area in m², number of rooms etc.

However, some shortcomings need to be resolved in order to improve the quality of the data in the Cadastre. The known shortcomings, among those already listed (in the section describing the discussion with the representatives of the Real Estate Directorate) are:

- Missing identification details for a large number of real estate owners. In addition, it is common for one person to own more properties.

- Very often, changes in the property's purpose of use are not reported to the Cadastre. For example, owners do not report that garages have been turned into apartments, apartments in business, etc.

- Number of rooms is not available for all housing units.

- The construction year is not available for all objects.

- The situation in the Cadastre does not correspond with the reality often because of the illegal construction as well as because of the buyers postponing application submission for the registration in the Cadastre. The owner of the residential building should be registered in the Cadastre when the construction is finished. When the apartment is sold, the buyer of the apartment should apply for the registration in the Cadastre. In reality, it often happens that people postpone the registration of ownership because of economic motives such as tax avoidance.

- In approximately 90% of cases, bigger buildings, i.e. those containing more special parts, are presented into details, at least, up to the floors level. On the other hand, facilities such as private houses in certain areas, are not elaborated in details in such a large percentage.

5. Identified current needs for additional variables

During the discussions with MONSTAT colleagues, some variables from different registers that are not available at this moment (due to legal obstacles) or not at all existent have been identified as of crucial importance for the production of the official statistics. For the moment, it concerns only several registers. In the following paragraphs, we have listed those variables.

5.1. CPR

Data on Montenegrin citizens			
Variables	**The variable is used**	**The variable is not used, but it is needed**	**The reason for non-use**
Kinship with the household holder (Srodstvo sa nosiocem domaćinstva)	No, but the data are collected through population census	Yes	Legal obstacle
Members of a household (Članovi domaćinstva)	No, but the data are collected through population census	Yes	Legal obstacle
Data on Montenegrin citizens with permanent or temporary residence abroad			
Variables	**The variable is used**	**The variable is not used, but it is needed**	**The reason for non-use**

Address in Montenegro (Adresa u Crnoj Gori)	Street-level addresses are not used, but they are used at the municipal and settlement levels, from registers of permanent and temporary residence	Yes, at street level	Legal obstacle

Data on foreigners who have property and rights and obligations in Montenegro in terms of pension and disability insurance, taxes, humanitarian and other grounds			
Variables	**The variable is used**	**The variable is not used, but it is needed**	**The reason for non-use**
Data on the property, right or obligation (Podaci o imovini, pravu ili obavezi)	No	Data on flats are required, if foreigners own them	Legal barrier; unfilled data base

Register of births			
Variables	**The variable is used**	**The variable is not used, but it is needed**	**The reason for non-use**
Birth order (Red rođenja)	No	Yes	The nonexistence of the variable in the content of the administrative register
Marital status of the child's parents (Bračni status roditelja djeteta)	No	Yes	The nonexistence of the variable in the content of the administrative register

The reasons for the „non-use" relate to the legal obstacles, which are identified in the conflicting articles of the Law governing the work of MONSTAT and the part of the Law governing the Ministry of the Interior related to the keeping of the Central Population Register. Regulatory legislation is currently in the process of being amended, and the result of the work of the legislative

authority should remove the barrier to the collection of individual data with an identifier from the Central Population Register by MONSTAT.

Data relating to household members and relationship with the householder do not represent variables of particular importance to the Ministry of the Interior. For this reason, data on Montenegrin citizens in the Central Population Register record missing values, that is, many fields in the database related to these variables are empty.

The variable referring to the addresses of Montenegrin citizens records the occupancy at the municipal and settlement levels, but there are missing values of address data at street level. The reason is that the Ministry of the Interior also depends on local governments for naming and numbering streets, as well as on the development of an address register by the Real Estate Administration. In this respect, it is not necessary to add a variable in the Central Population Register, but to improve the quality and quantity of data on the addresses of Montenegrin citizens.

The table also lists two variables that, by the nature of the information they provide, would represent the potential contents of the Register of births. The Register of births is the administrative source used to form the Central Population Register. Listed variables are not currently included in the Register of births. It is possible to formulate a recommendation to the Ministry of the Interior, which consists of a proposal to expand the content of administrative bases related to births. Using these variables, the Statistical Office would comply with the Eurostat's regulations regarding the official statistics on births.

5.2. RTIP

There are no variables in the specified administrative register that are not used to fit the needs of official statistics.

However, MONSTAT, more precisely the Department of Labour market has prepared the list of variables needed to be added or improved by the Tax administration of Montenegro, in order to comply with the needs of the official statistics. The list has been sent in the form of request in the beginning of October 2019. The variables are listed below

Proposal for inclusion of new variables
The total number of paid working hours of employees who received earnings; (Ukupan broj plaćenih časova rada zaposlenih koji su primili zaradu)
Paid unworked hours (vacation, sick leave paid by the employer (up to 60 days), public holidays and non-working days established by law, other paid and unworked hours); (Plaćeni neizvršeni časovi rada (časovi godišnjeg odmora, časovi bolovanja koji idu na teret poslodavca (do 60dana), državni praznici i neradni dani utvrđeni zakonom, ostali plaćeni, a neizvršeni časovi rada))
The amount of accrued earnings; (Iznos obračunatih zarada)
Extraordinary bonuses and fees (Vanredni bonusi i naknade)
The amount of earnings related to overtime hours worked in the month (Iznos zarade koji se odnosi na prekovremene časove rada u mjesecu)
Amount of earnings related to shift work, night work or weekend work (Iznos zarade koji se odnosi na rad po smjenama, noćni rad ili rad tokom vikenda)
Number of vacation days (Broj dana godišnjeg odmora)
Number of other paid days off in the year (Broj ostalih plaćenih dana odsustva u godini)
The number of weeks to which the employee's annual payments relate (Broj nedelja na koje se odnose godišnja plaćanja zaposlenog)
The usual number of working hours in a week (Uobičajeni broj časova rada u nedelji)
Number of paid overtime hours per month (Broj plaćenih prekovremenih časova rada u mjesecu)
Regular bonuses and fees in a month (Redovni bonusi i naknade u mjesecu)
Number of health insurers on the basis of unemployment (Broj zdravstvenih osiguranika po osnovu nezaposlenosti)

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Proposal to improve the content of existing variables
Occupation (Zanimanje)
Date of commencement of work in the company (Datum početka rada u preduzeću)
Date of termination of work in the company (Datum prestanka rada u preduzeću)
Highest level of education completed (Najveći završeni stepen obrazovanja)
Year of birth (Godina rođenja)
Citizenship (Državljanstvo)
Type of contract (Tip ugovora)
Working hours on contract (Radno vrijeme po ugovoru)

Also, as already mentioned, it is necessary to reduce the number of incorrect classifications. The codes provided are sometimes five-digit (by NACE Rev. 1), instead of four-digit by the new NACE Rev. 2 classification.

5.3. RUP

It was found that MONSTAT does not use the administrative variables on unemployment, which are contained in databases under the authority of the Employment agency of Montenegro. The reason is the mismatch between the statistical and administrative methodologies used to measure the unemployment rate.

In order to meet its needs and produce the results of official statistics, MONSTAT collects data on vacancies from the special administrative records of the Employment agency. There are no missing values in the databases for the collected variables.

Also, it was found that MONSTAT, at this point, has no requirements for the Employment agency, regarding the variables that need to be added to the administrative records.

6. Conclusions

Montenegro has a great potential to become a country that can, with some additional effort and in a relatively short period, completely transform their statistical system in order to rely solely on administrative registers for the production of their official statistics. However, additional legal, methodological and political steps and efforts need to be undertaken before achieving this goal, which would greatly reduce the time and the costs of the production of the official statistics as well as the burden on the respondents.

It appears that there is also a political willingness in order to achieve this since the Government of Montenegro has also recognised the importance of the shift towards the more important use of administrative data. As previously mentioned, on the initiative of the Government of Montenegro with the Ministry of Public Administration in charge a "Government Service Bus" (GSB) was created. Government Service Bus is a government's project to implement a single electronic public administration system for electronic exchange of data between state and state administration bodies in order to create better conditions for efficient public administration and eliminate barriers to the further development of e-government in Montenegro.

However, it must be underlined that MONSTAT must have legal authority to access all the relevant administrative data from all the public authority sources that they deem necessary for the production of the official statistics. Moreover, for the successful functioning of the system, existing of the signed technical protocols (between MONSTAT and "owners" of registers) that define the technical details related to the data that are received, periodicity for submission of data, the structure of tables etc. are paramount.

The production of the official statistics is, in broadest terms, divided into social statistics and business statistics. For the production of the social statistics, the main "key" register is the Central Population Register and for the production of the business statistics, that is the Central Register of Business Entities. For the successful production of the official data, they both rely on the Address register.

For the moment, certain legal steps have been undertaken in view of introduction of a new personal identification number, which would replace the existing unique personal identification number of

citizens (JMBG). In this way, MONSTAT would be enabled to take over the data of the Ministry of Internal Affairs directly from the Central Population Register, providing the basis for identification of citizens in order to meet statistical needs, without violating the laws governing the exchange and protection of administrative and personal data.

As for the Central Register of Business Entities, MONSTAT currently receives data for twenty-two variables contained in this register with a perfect score of zero missing values. However, the accuracy of received data should be checked since it is noted that address and contact information involve data which are not sufficiently updated.

As regards the Address register, software development is underway, at this moment. The completion is planned for September 2020, when the migration of a certain part of the data is also planned. The software will be received both in the Real Estate Administration and in the secretariats of local self-governments. The preparation of draft legislation is also underway, which will regulate the manner and keeping of the Address register.

Concerning the other registers covered by this project, it was found that in general the Laws governing registers often lack clear specifications of the definitions and classifications of variables so owners of the registers have their own "internal" documents or codebooks that define those classifications, which means that there are essential differences between administrative and statistical methodologies. This issue should be resolved, where possible, with the cooperation between MONSTAT and the owners of the registers. Moreover, it is important to emphasise the need to follow EUROSTAT and UNECE recommendations in doing so, since recent and future plans for change of the definitions of the variables and methodology show an evident shift towards the definitions that will more easily be obtained via administrative data. Another issue that is observed is that sometimes the owners of the registers do not collect certain data even if that data is envisaged by the law since they deem the data not important for their needs but MONSTAT could definitely profit from them. It is vital that the administrative data holders know how important their data are to MONSTAT and how their data are to be used.

In general terms, in order for MONSTAT to shift to the use of administrative data for the production of the official statistics, firstly the legislative obstacles should be resolved with the help of the Government and the changes of the laws that currently block this transition and then the work should be concentrated to the cooperation with the owners of the registers in order to try to

resolve the technical challenges that arose during the analysis of their registers (differences in definitions, important number of missing values, non-collection of variables that are not "interesting" for them, etc.).

It would be of upmost importance to resolve these challenges in the following period so that MONSTAT could check, once again, the quality of the needed registers by confronting the data of the upcoming Census of Population Households and Dwellings.

7. Annex

Excel table in Attachment