



TWINNING CONTRACT

JO 21 ENI ST 01 22

Strengthening the capacity of Jordan's Department of Statistics in terms of compilation, analysis and reporting of statistical data in line with International and European best practices

MISSION REPORT

on

Component 1

Roadmap for the development of an integrated administrative data system in Jordan with pilots on Statistical Business registers (SBR) and population statistics

Activity 1.3.3

Best practices for evaluating quality of administrative data population statistics and building an address register

Mission carried out by

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List of Abbreviations

- BC – Beneficiary Country
- EES – European Statistical System
- DoS – Department of Statistics
- MS – Member State
- PL – Project Leader
- RTA – Resident Twinning Advisor
- STE – Short-term Expert

1. General comments

This mission report was prepared within the Twinning Project “Strengthening the capacity of Jordan’s Department of Statistics in terms of compilation, analysis and reporting of statistical data in line with International and European best practices”. The current activity was part of Component 1 aiming to implement use of administrative data for production of official statistics with particular focus on Mandatory Result (MR) 1.3: *Undertake pilot project on how administrative records can be used to strengthen population statistics and inform framing of the 2025 CoP questionnaire*

The purposes of the mission were:

- Examine the quality of administrative data;
- How to organize and build register based on administrative data taking outset building a population register and an address register;

The consultants would like to express their sincere thanks to all officials and individuals met for the kind support and valuable information which they received during the stay in Jordan and which highly facilitated their work. The views and observations stated in this report are those of the consultants and do not necessarily correspond to the views of EU, Statistics Lithuania or The German Federal Statistical Office (Destatis).

2. Assessment and results

The study visit started with a presentation of expectations of Department of Statistics Jordan (DoS). As a clear expectation it was expressed, that evaluation of quality of administrative data sources received by DoS has to be conducted. Also, there is a need to start building an Address register and a Population register. Experience from the experts was considered to be in need for building a framework for evaluation of quality of administrative data sources and also for planning activities for building Address and Population registers.

Experiences from assessing quality of administrative data in Germany as well as organizing and building registers were presented. A special emphasis was put on the need of standardisation of variables as well as data analysis and institutional assessment. For institutional relevance there was given the example of a weighted sum to come to a quality indicator.

During and before the mission the register profiles for the Civil status and passports department, the Social security corporation, the Ministry of Higher Education and Scientific Research and the Health insurance department were filled in by DoS. The experts emphasized their view that it is important to fill in the profiles as detailed as possible.

Moreover, it was possible to work with the data from the civil status register in STATA and write some code to build a population for a specific reference point in time. Gaining practical experience in analyzing data was one of the expected outcomes of the mission. Writing some standardisation code for the variables date of birth and date of death was a necessary prerequisite for building a population for the date of the Census in 2015 (30/11/2015) from the Civil status register, since there were different formats in the data of the civil status register for the variables date of birth as well as date of death and people who were born after 30/11/2015 shall not be included in the population whereas people who died after this date need to be included. While working with the data some implausibilities and missing values were figured out, for example a missing date of death although the person is stated as dead in

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around 57,000 cases. During writing the code it was stressed that it is always important to have a good quality assurance of the code written since it is really important that the executed code does what it is supposed to do.

The Civil status register also includes Jordanians living outside the country. However, as the quality of the place of residence in the civil status register is not good, it is not possible from this data to find out which people lived in Jordan at that time and which not. Therefore an approximate number of Jordanians living outside the country was used to calculate the overall coverage of Jordanians living in the country in the civil status register at 30/11/2015. It turned out that in total there seems to be a slight (< 3%) under coverage in the civil status register. However, this needs to be analysed in detail (by age, sex, etc.). For this detailed data on Jordanians living abroad at a point in time close to the Census 2015 reference date is crucial. For the sake of completeness the written code for standardisation as well as building a population from the civil status register at a reference point is attached as an annex to this report.

The second purpose of the mission was to start building a population and address register. After analysis the sample data for the civil status register and the electricity data obtained by DoS, it became clear that the data contained only a regional classification up until the city level. No addresses or coordinates were included in the sample file. While the data therefore cannot be used to build an address register, it could be used for plausibility checks to validate the number of addresses in the register. The electricity companies might hold more detailed address data, which could also be used to update the address register.

After the evaluation of the obtained administrative data, the existing data within DoS was used to discuss steps to build an address register for the next census. The existing list of addresses from census 2015 has a high quality, but hasn't been updated since the last census. The updated boundaries of the governorates, districts, subdistricts, areas and cities/villages can be obtained from the Royal Jordanian Geographical Center. These can be used to update information in existing addresses. The key challenge to build an address register therefore lies in the identification of sources to obtain new addresses. One source that has been identified is municipal address data. For the municipalities of Amman, Irbid and Akaba, new buildings and therefore addresses are added to the municipal data. In the experience of DoS this data is quite good. The coordinates that are provided by the municipality match those obtained in the 2015 census very closely and new addresses are regularly added to the data. The quality of the other municipal data is not yet clear. In preparation for the 2015 census round, the data quality of the other municipalities was found to be lacking, as boundaries were not exact and new addresses were not added. No information exists, whether the current quality of the other municipalities has improved.

In addition to discussion on data already present in DoS, ways of obtaining information on new buildings and therefore addresses by opening up new data sources have been discussed. As buying a plot of land and construction of buildings in Jordan requires a permit, the data holders that grant these permits might be a useful data source. A potential data source that has been discussed in this context is the ministry of public works and housing.

For constructing an address register for the census in 2025, a combination of data sources has been discussed. The existing list of addresses from the census 2015 could be used as a base for the creation of an address register. To update the boundaries of existing addresses, data from the Royal Jordanian Geographical Center could be used. To include new addresses, municipal data could be used in the areas in which the data quality is high (Amman, Irbid and Akaba). In the remaining areas, new address would have to be collected in the field, if no other data source can be identified and accessed. Further updates and maintenance is

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depended on the decision whether the address register will be used as a national address register or kept as a statistical register inside DoS.

A short version of a **framework for evaluation of quality of administrative data sources** was presented and discussed, also it should be expanded at the later stage. While evaluating the quality of administrative data sources the following quality components could be assessed:

1. Coverage. Over-coverage (percentage of units not belonging to population) as well as Under-coverage (percentage of units missing from the target population) should be assessed whenever possible. Assessment of over- and under- coverage is not always easy and also not always possible.

To assess the coverage of Civil status register aggregated tables (by age, sex, region, etc.) for Jordanians and for the same reference day as Census 2015 should be compared to results of Census 2015 (as already started during the mission). However, as there are also Jordanians not living in Jordan listed in the Civil status register, this comparison is not exact enough to evaluate coverage of the Civil status Register as exact as needed.

Therefore, Border Control data would be extremely helpful for assessment of the coverage of Civils status register. If exact number of Jordanians not present in the country could be achieved from Border Control as detailed as possible, then coverage of Jordanians in the Civil status register could be estimated by age, sex, etc. Furthermore, Border Control data would be extremely helpful to get an impression on how many Non-Jordanians live in the country.

Special attention should be paid to assess over-coverage of elderly people, since it was noticed in previous analysis that this is a problematic group, probably due to missing death records in Civil status register. Since the oldest person in Civil status register is 173 years old there is a serious reason to believe that this person is dead. A scale of missing death records might be found out by comparing Census 2015 tables by detailed age with Civil status tables for the same reference group.

2. Completeness of each variable. Missing values or out of range values should be calculated for each variable in a given administrative data source. Out of range values mean, for example, when sex has to be coded into two values (1 and 2) but in database other values appear, those other than 1 or 2 are out of range or wrongly entered values.

3. Timeliness of each variable. Time lag between reference period and availability of the data. For example, according to legal acts the birth has to be reported within 3 months, but it is also important to calculate how long it takes in reality. For example, when analyzing those who were born during 2022, one might get a result that after one month X% of birth are available, after three months – Y%, after one year Z%).

4. Measurement errors. It is important to think about rules how to detect measurement errors for each administrative data source. Below some examples are presented, but also more rules should be applied:

- Compare father and mother from family booklet and from civil status register
- Too many children born by one woman (a number of women who has more than 20 children)
- a person of 173 years old (either over coverage error (if this person is dead) or measurement error (if the age of this person indicated incorrectly))

5. Linkability with other sources. Possibilities to link data of each register with other registers should be described and tested. Describe identifiers and check how it works. Double check the quality of identifiers since they are the most important variables of any register.

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6. Compare with other sources. Same reference point, same population and same variables (or as close as possible).

This is only key quality indicators which could be calculated each time administrative data arrives to DoS. More information can be found in UNECE [Guidelines for Assessing the Quality of Administrative Sources for Use in Censuses](#) while tacking into account national needs.

3. Conclusions and recommendations

It was concluded that the register profiles are really important to have a good overview of the metadata of a source. Reviewing the already filled out register profiles the experts gave the recommendations to

- be as detailed as possible when filling in a profile
- ask the source keeper for all variables and add all for DoS relevant variables in the register profile template
- compare the statistical definitions with those of the register
- add a classification of each variable in an appendix.

After filling in register profiles it is important to evaluate the quality of administrative data received. Some quality indicators were discussed during the mission also more information can be found in UNECE [Guidelines for Assessing the Quality of Administrative Sources for Use in Censuses](#) while tacking into account national needs.

Practical experience in working with data is crucial. Having a look into the data and writing some STATA code together was a very beneficial activity throughout this mission as general recommendations on how to analyse data and what is important when writing some code were given under circumstances where they could be applied immediately to a special use case.

Experts recommend to

- write a documentation of written code to increase readability
- conduct checks on formats as well as (inter-) plausibility of values
- standardise data when there are different formats
- try to speak with the source keeper about implausible/missing values
- start with general assessment of coverage (whole population) and go on with detailed assessment (e.g. by age, sex, age and sex)
- do quality assurance of code in order to ensure that executed code does what it is supposed to do, so if there are non expected values, analyse where they come from

At first glance it seems to be that the coverage of Jordanians in the country is quite good and that there is just a slight under coverage (comparison of results of census 2015 with civil status register at census reference date). However, further, more detailed analysis needs to be done to come to a final assessment. Therefore, experts recommend to get border control data – as detailed as possible, at least more detailed aggregated data (e.g. by age, sex, nationality) – and if possible not just recent data but also data at a point in time close to the Census 2015 reference date.

For the purpose of building an address register, it is recommended to check whether current data sources have data on a more detailed level. Furthermore, the mentioned additional data sources should be taken into consideration when deciding how to build the address register. Once a more complete overview on existing and new data sources exist, evaluation of the data sources should enable a plan to build an address register and to keep it updated.

Annex 1. Terms of Reference

Terms of Reference

EU Twinning Project JO 21 ENI ST 01 22

Component 1:

Roadmap for the development of an integrated administrative data system in Jordan with pilots on Statistical Business registers (SBR) and population statistics

Activity 1.3.3:

Best practices for evaluating quality of administrative data population statistics and building an address register

Dates: 19 - 22 June 2023

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List of abbreviations

BC	Beneficiary Country
DoS	Department of Statistics
ESS	European Statistical System
MS	Member State
RTA	Resident Twinning Advisor
STE	Short Term Expert
ToR	Term of References

0. Objective and Mandatory Results for the component

Objective

To prepare a roadmap for the development of an integrated administrative data system for Jordan, and conduct pilot projects on creating an SBR and strengthening population statistics.

As the development of a fully integrated administrative data system is a long-term project. The main focus of the Twinning project will be on specific pilot projects where the use of administrative records can address key challenges currently faced by the DoS. These pilot projects will constitute the first steps in rolling out a roadmap for the Jordanian statistical system by providing a template for expanding the use of administrative data across the wider statistical system over time. Specifically, the pilots for the Twinning project will focus on the development of a statistical business register (SBR) and improving the quality of population statistics.

In addition to improving population estimates, administrative data can also contribute to refining the scope of the 2025¹ General Population and Housing Census (COP) questionnaire, thereby freeing up resources in the DoS.

This sub-component will examine how administrative records can provide new source data to better monitor population inflows and movements across governorates and municipalities. A pilot project will assess how administrative data (e.g., from the Civil Status and Passports Department) can be combined with DoS data such as the CoP to strengthen population statistics. The Twinning project may wish to explore data sources other than administrative data – for instance, Cities and Villages Development Bank (CVDB) compiles data at small area level on population movements. Administrative data on population attributes may also help in replacing data currently collected in CoPs. This sub-component will assess how administrative data can help in framing the questionnaire for the 2025 Census, with particular focus on the potential to free up resources in the DoS.

Recently the [Jordan Economic Modernization Vision 2030](#) was launched and “[Smart Jordan](#)” was identified as one of the eight Growth Drivers to implement the Economic Modernization Vision. The ‘Smart Jordan Driver’ includes seven sectors where data is one of them. This indicates the national interest to ensure constant and reliable data sources, and robust statistical systems that contribute to timely and informed policy making. It is expected that one of the measures that will be taken is to transform Jordan's Department of Statistics (DoS) into an interactive National Statistical Center (NSC).

¹ Might be postponed to 2026 – still not decided

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Component 1 is sub-divided in five sub-components each with a Mandatory Results (MR) and two to four indicators of achievements associated with the sub-component.

Mandatory results and indicators for achievement for each sub-component

Table 1: Mandatory results and indicators for achievement (IA) for each sub-components within Component 1: an integrated administrative data system for Jordan

MR from the Twinning Fiche	Indicator
MR 1.1: Compile an inventory of administrative data on business and households and an indicative roadmap for inclusion in an integrated system	<p>Indicator 1.1.A: Inventory of administrative data variables and detailed supporting metadata prepared</p> <p>Indicator 1.1.B: Tentative roadmap prepared for inclusion of data in integrated system</p>
MR 1.2: Pilot project to develop strategy for integrating administrative data sources for the purposes of creating an SBR	<p>Indicator 1.2.A: Administrative data sources identified and assessed and plan developed for integrating these with Census of Establishments (CoE) information in an SBR</p> <p>Indicator 1.2.B: Documentation prepared on database structures and compliance with statistical standards, classifications (e.g. ISIC, Rev 4) etc. and use of common identifiers etc.</p> <p>Indicator 1.2.C: Explore how SBS can benefit other statistical domains in the DoS</p>
MR 1.3: Undertake pilot project on how administrative records can be used to strengthen population statistics and inform framing of the 2025 CoP questionnaire	<p>Indicator 1.3.A: Inventory of data sources prepared and assessed and action plan for incorporation in DoS statistics developed</p> <p>Indicator 1.3.B: Methodology developed for incorporating administrative data</p> <p>Indicator 1.3.C: Documentation prepared on statistical standards, classifications, identifiers, mapping etc.</p> <p>Indicator 1.3.D: Review of how administrative data can assist in developing the COP 2025 questionnaires</p>
MR 1.4: Develop strategy for ensuring flows of data between the DoS and counterpart institutions are established on an ongoing basis for pilot projects above	<p>Indicator 1.4.A: Review of technical infrastructure for data transfers and action plan prepared based on 1.1 and 1.2 above</p> <p>Indicator 1.4.B: MoUs agreed between DoS and partner institutions</p> <p>Indicator 1.4.C: Agreement on statistical standards, classifications, identifiers etc. between DoS and partner institutions</p> <p>Indicator 1.4.D: Review of data flows within the DoS</p>
MR 1.5: Implement training programmes and develop training materials both within DoS and with partner institutions on the use of administrative records for statistical purposes, based on pilot projects above	<p>Indicator 1.5.A: Detailed documentation on statistical standards, classifications, identifiers etc. developed.</p> <p>Indicator 1.5.B: Comprehensive training programs and workshops provided for DoS staff and partner institutions</p> <p>Indicator 1.5.C: DoS leadership role in ensuring proper statistical standards applied across the Jordanian statistical system reinforced.</p>

1. Current Status

Current status for administrative data in Jordan to be used for population and housing registers

- **Available administrative data on person level has been received from:**
 - Civil status and Passport Department
 - Ministry of Health Insurance
 - Ministry of Higher education and Science (data on students)
 - The social Security Department

- **Other administrative data owner that has been contacted but where no data has been received**
 - Ministry of Education
 - Supreme Judge Department

- **Other potential data sources**
 - Data from Electricity companies
 - The Royal Jordanian Geographical Center (GIS data on buildings)
 - The Tax Department
 - Data from municipalities
 - Residency and Boarder Control Department (DoS might not be able to receive micro data. However, it should be explored if aggregated data can be received in order to be used for estimating under and over coverage)
 - SANAD - The gateway to digital government services for people in Jordan²
 - *NB There are ongoing projects related to addresses where cooperation might be established. They are (a) A UNDP project with local administration and (2) Cities and Villages Development Bank (CVDB) that compiles data at small area level on population movements.*

- **Data that received for SBR that might be useful?**
 - Social Security Corporation (Occupation)
 - Greater Amman municipality

- **Relevant surveys (NB Does not contain personnel ID number)**
 - HEIS
 - LSF
 - 2015 Census

² The "Sanad" application offers access to more than 100 digital services for the following institutions and ministries: Civil Status and Passports Department; Greater Amman Municipality; Department of Lands and Survey; Ministry of Justice; National Aid Fund; Ministry of Social Development; Ministry of Industry, Trade and Companies Control Department

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2. Purpose of the activity

The purpose of this activity is:

- Examine the quality of administrative data;
- How to organize and build register based on administrative data taking outset building a population register and an address register;

In table 2 preparation for the Mission by DoS staff members are listed.

Table 2: Preparation actions taken by DoS before the Mission

Action	Status
Produce a (complete) list of possible sources for building address registers (mapping)	<i>In progress</i>
Produce a profile for each source (using the Destatis template) aimed to be used for building the address register or any other purpose for census 2025	<i>Completed</i>
Select relevant variables for each register	<i>Completed</i>
Get access to electricity data if possible to full dataset if not access to a sample.	<i>In progress</i>
Get access to a sample of GIS data on buildings from The Royal Jordanian Geographical Center (not a prerequisite)	<i>In progress</i>
If possible get access to full dataset or sample dataset from other administrative sources mapped by DoS but not yet available (in cases where it seems relevant)	<i>In progress</i>
Prepare aggregated population tables from the admin source civil register AND a comparable current database (e.g. population statistics). The tables should include the following dimensions: Age, sex, geographical areas (aggregation level comparable in both sources). Foreigners should not be considered in the population statistics as they are missing systematically in the civil register.	<i>Completed</i>
Prepare aggregated tables on number of addresses from 4 sources, by municipalities (or other regional breakdown): <ul style="list-style-type: none"> • Civil register • Electricity register • GIS data on buildings from The Royal Jordanian Geographical Center • Census 2015 	<i>In progress</i>

3. Expected output of the activity

- Activity report;
- An inventory of administrative data to support building a population register and an address register compiled
- A common understanding of best practices for integrating administrative data in the statistical production process has been obtained;
- A common understanding structure and requirements for establishing registers taken
- Practical experiences in evaluating quality of administrative data obtained – taking outset in data from Jordan
- Indicators for quality of administrative data calculated for selected administrative sources calculated (using Stata)
- First draft version of a population and address registers in Jordan created

4. Participants

MS Short Term Experts (STE's)

- **Ms. Milda Šličkutė-Šeštokienė, Advisor, Population Statistics Division (LT)**
 Ms. Milda Šličkutė-Šeštokienė has more than 20 year of experience in social statistics. Since 2016 Ms. Milda Šličkutė-Šeštokienė has been responsible for (a) coordination of methodological work related to preparation for register-based Census 2021; (b) Coordination of creation of the Integrated Social Statistics Data Warehouse, (c) Coordination of creation of methodologies for estimation of census variables based on different administrative sources, (d) Data confidentiality issues and (e) Data quality management.
 E-Mail: milda.slickute@stat.gov.lt
- **Mr. Florian Alexander Hennig, Expert on Buildings and Housing, The German Federal Statistical Office (Destatis)**
 Mr. Florian Hennig has extensive knowledge on address registers including: Concept for development of the address register; Evaluation of statistical, administrative and external data sources; Requirements analysis for the software development, Stakeholder management; Geospatial information and small area statistics for censuses. Mr. Florian Hennig is also member of the task force 11 of the UNECE Group of Experts on Population and Housing Censuses.
 E-mail: florian.hennig@destatis.de
- **Mr. Tobias Kahlenberg, Expert on using administrative data for production of register-based census and population statistics, The German Federal Statistical Office (Destatis)**
 Mr. Tobias Kahlenberg has extensive knowledge on using administrative data for production of register-based census and population statistics including evaluating quality of administrative data sources.
 E-mail: tobias.kahlenberg@destatis.de

DoS experts

DIRECTORATE OF DATA MANAGEMENT

Administrative Data Division

- Mr. Safwat Radaideh, Head of Administrative Data Division
- Mr. Mohammad Alomari, Statistician, Administrative Data Division
- Mr. Amani, Statistician, Administrative Data Division

DIRECTORATE OF HOUSEHOLD AND POPULATION

Poverty, Household Income and Expenditure Division

- Ms. Fatmeh Awamreh, Head of Household Expenditure and Income Division
- Ms. Sana AlMamani, Statistician, Household and Population Surveys Directory

DIRECTORATE OF METHODOLOGIES AND DATA DIVISION

Quality Assurance Division

- Mr. Dred Al-Shawoura, Head of the Quality Department
- Derar Jawarneh, Statistician, Head of the Quality Department

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DIRECTORATE OF ELECTRONIC TRANSFORMATION AND IT

- 2 participants - still to be selected

Twinning team

- Eng. Mohammad Khalaf, Director of Sustainable Development Unit, Department of Statistics (DoS), Jordan (RTA Counterpart)
- Dr. Charlotte Nielsen (RTA)
- Ms. Zaina Amireh (Language Assistant)

5. Resources

Translation and interpretation will be provided throughout the activity. Translation will be provided as sequential translation. Therefore, please keep make frequent breaks when presenting and talking allowing our project translator to provide as accurate a translation as possible.

The venue will be the Meeting room at DoS. Flip-overs and other office material will be available.

6. Overall agenda

Day 1 (09:30 – 15:00):

- **BC:** Presentation of results from preparation actions taken by DoS before the Mission;
- **MS:** Introduction to best practice for assessing the quality of administrative data;

Day 2 (09:30 – 15:00):

- **BC and MS:** Peer-to-peer activity on assessing the quality of selected Jordanian administrative data.
NB: Prerequisite – access to data available

Day 3 (09:30 – 15:00):

- **MS:** Introduction to best practice for building an address register;
- **BC and MS:** Peer-to-peer activity on building an address register in Jordan
NB: Prerequisite – access to data available

Day 4 (09:30 – 15:00):

- **BC and MS:** Follow up from the previous days
- **BC and MS:** Agreement of next steps to be taken
- **BC and MS:** Summing up and conclusion

STATA code for standardisation as well as building a population from the civil status register at a reference point

twining team and safwat team**

*** work this in safwat office 20/6/2023*****

***It was figured out that there were different formats of date variables, the formats were the following ones:

M/D/YYYY

MM/D/YYYY

M/DD/YYYY

MM/DD/YYYY

YYYY-MM-DD***

The different formats need to be standardised. Therefore, separate variables for day, month and year are created. It is important to keep in mind the different delimiters and use them as conditions to fill in these variables. Extensive commentation just for date of birth.

****HERE WE SPLIT BRITHDATE VAR. IN CIVIL DATA TO THREE VAR.
CONTAIN YEAR & MONTH & DAY****

gen month= 0

replace month = real(substr(birthdt, 1, 1)) if substr(birthdt, 2, 1) == "/" ***needed for formats M/D/YYYY and M/DD/YYYY***

replace month = real(substr(birthdt, 1, 2)) if substr(birthdt, 3, 1) == "/" ***needed for formats MM/D/YYYY and MM/DD/YYYY***

replace month = real(substr(birthdt, 6, 2)) if substr(birthdt, 5, 1) == "-" ***needed for format YYYY-MM-DD***

replace month=. if month==0 ***needed for missings***

gen year= 0

replace year = real(substr(birthdt, 5, 4)) if substr(birthdt, 4, 1) == "/" ***needed for format M/D/YYYY***

replace year = real(substr(birthdt, 6, 4)) if substr(birthdt, 5, 1) == "/" ***needed for formats MM/D/YYYY and M/DD/YYYY***

replace year = real(substr(birthdt, 7, 4)) if substr(birthdt, 6, 1) == "/" ***needed for format MM/DD/YYYY***

replace year = real(substr(birthdt, 1, 4)) if substr(birthdt, 5, 1) == "-" ***needed for format YYYY-MM-DD***

replace year=. if year==0 ***needed for missings***

gen day= 0

replace day = real(substr(birthdt, 3, 1)) if substr(birthdt, 2, 1) == "/" & substr(birthdt, 4, 1) == "/" ***needed for format M/D/YYYY***

replace day = real(substr(birthdt, 3, 2)) if substr(birthdt, 2, 1) == "/" & substr(birthdt, 5, 1) == "/" ***needed for format M/DD/YYYY***

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```
replace day = real(substr( birthdt, 4, 2)) if substr( birthdt, 3, 1) == "/" & substr( birthdt, 6, 1)
== "/" ***needed for format MM/DD/YYYY***
```

```
replace day = real(substr( birthdt, 4, 1)) if substr( birthdt, 3, 1) == "/" & substr( birthdt, 5, 1)
== "/" ***needed for format MM/D/YYYY***
```

```
replace day = real(substr( birthdt, 9, 2)) if substr( birthdt, 8, 1) == "-"
```

```
replace day=. if day==0 ***needed for missings***
```

```
*****death date split (year, month, date)*****
```

```
*****we find in data people who are alive and have a date of death*****
```

```
***** (100 case) call mr. husain rasheed to ask about this people*****
```

```
gen month_death= 0
```

```
replace month_death = real(substr( death_dt, 1, 1)) if substr( death_dt, 2, 1) == "/"
```

```
replace month_death = real(substr( death_dt, 1, 2)) if substr( death_dt, 3, 1) == "/"
```

```
replace month_death = real(substr( death_dt, 6, 2)) if substr( death_dt, 5, 1) == "-"
```

```
replace month_death=. if month_death==0
```

```
gen year_death= 0
```

```
replace year_death = real(substr( death_dt, 5, 4)) if substr( death_dt, 4, 1) == "/"
```

```
replace year_death = real(substr( death_dt, 6, 4)) if substr( death_dt, 5, 1) == "/"
```

```
replace year_death = real(substr( death_dt, 7, 4)) if substr( death_dt, 6, 1) == "/"
```

```
replace year_death = real(substr( death_dt, 1, 4)) if substr( death_dt, 5, 1) == "-"
```

```
replace year_death=. if year_death==0
```

```
drop day_death
```

```
gen day_death= 0
```

```
replace day_death = real(substr( death_dt, 3, 1)) if substr( death_dt, 2, 1) == "/" & substr(
death_dt, 4, 1) == "/"
```

```
replace day_death = real(substr( death_dt, 3, 2)) if substr( death_dt, 2, 1) == "/" & substr(
death_dt, 5, 1) == "/"
```

```
replace day_death = real(substr( death_dt, 4, 2)) if substr( death_dt, 3, 1) == "/" & substr(
death_dt, 6, 1) == "/"
```

```
replace day_death = real(substr( death_dt, 4, 1)) if substr( death_dt, 3, 1) == "/" & substr(
death_dt, 5, 1) == "/"
```

```
replace day_death = real(substr( death_dt, 9, 2)) if substr( death_dt, 8, 1) == "-"
```

```
replace day_death=. if day_death==0
```

```
***** generate change flag date*****
```

```
gen month_ch_dt= 0
```

```
replace month_ch_dt = real(substr( chg_dt, 1, 1)) if substr( chg_dt, 2, 1) == "/"
```

```
replace month_ch_dt = real(substr( chg_dt, 1, 2)) if substr( chg_dt, 3, 1) == "/"
```

```
replace month_ch_dt = real(substr( chg_dt, 6, 2)) if substr( chg_dt, 5, 1) == "-"
```

```
replace month_ch_dt=. if month_ch_dt==0
```

```
gen year_ch_dt= 0
```

```
replace year_ch_dt = real(substr( chg_dt, 5, 4)) if substr( chg_dt, 4, 1) == "/"
```

```
replace year_ch_dt = real(substr( chg_dt, 6, 4)) if substr( chg_dt, 5, 1) == "/"
```

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```

replace year_ch_dt = real(substr( chg_dt, 7, 4)) if substr( chg_dt, 6, 1) == "/"
replace year_ch_dt = real(substr( chg_dt, 1, 4)) if substr( chg_dt, 5, 1) == "-"
replace year_ch_dt=. if year_ch_dt==0

```

```

gen day_ch_dt= 0
replace day_ch_dt = real(substr( chg_dt, 3, 1)) if substr( chg_dt, 2, 1) == "/" & substr(
chg_dt, 4, 1) == "/"
replace day_ch_dt = real(substr( chg_dt, 3, 2)) if substr( chg_dt, 2, 1) == "/" & substr(
chg_dt, 5, 1) == "/"
replace day_ch_dt = real(substr( chg_dt, 4, 2)) if substr( chg_dt, 3, 1) == "/" & substr(
chg_dt, 6, 1) == "/"
replace day_ch_dt = real(substr( chg_dt, 4, 1)) if substr( chg_dt, 3, 1) == "/" & substr(
chg_dt, 5, 1) == "/"
replace day_ch_dt = real(substr( chg_dt, 9, 2)) if substr( chg_dt, 8, 1) == "-"
replace day_ch_dt=. if day_ch_dt==0

```

****this equation we do it to comparing between (POPULATION NUMBER) IN civil register result and census result in the same reference period (30/11/2015)**

*****do this twining team & safwat radaideh from dos in 20/6/2023 in dos*******

*****to build a population for a specific reference point (DD/MM/YYYY) in history from the current civil register one has to count in all people who were alive at the reference point. Therefore starting from the current civil register one has to remove all people born after the reference point and include all people who died after the refernce point. This is done by the following code:*******

```

ta gov if mnation==1 & (death_c==0 | ( (death_c==1 | death_c==2) & ((year_death>2015
|(year_death==2015 & month_death > 11 ) | (year_death== 2015 & month_death== 11 &
day_death >30)) |(year_death==. & month_death==. & day_death==. & (year_ch_dt>2015
|(year_ch_dt==2015 & month_ch_dt > 11 ) | (year_ch_dt== 2015 & month_ch_dt== 11 &
day_ch_dt >30)))))) & ( year<2015 | (year== 2015 & month<= 11) | (year==2015 &
month==11 & day<= 30)) , m

```

*****the part „(death_c==0 | ((death_c==1 | death_c==2) & ((year_death>2015 |(year_death==2015 & month_death > 11) | (year_death== 2015 & month_death== 11 & day_death >30)) |(year_death==. & month_death==. & day_death==. & (year_ch_dt>2015 |(year_ch_dt==2015 & month_ch_dt > 11) | (year_ch_dt== 2015 & month_ch_dt== 11 & day_ch_dt >30))))))” does the following:**

the person has to be still alive (death_c == 0) or died after the 30/11/2015. For the fact that the person is dead, (death_c==1 | death_c==2) is used. However, it needs to be after the reference point. For this the generated variables year_death, month_death and day_death are used (part in the code: „((year_death>2015 |(year_death==2015 & month_death > 11) | (year_death== 2015 & month_death== 11 & day_death >30)))”). If death_dt is missing the variables year_chg_dt, month_chg_dt and day_chg_dt generated chg_dt are used instead (part in the code: „(year_death==. & month_death==. & day_death==. & (year_ch_dt>2015 |(year_ch_dt==2015 &

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```
month_ch_dt > 11 ) | (year_ch_dt== 2015 & month_ch_dt== 11 & day_ch_dt  
>30)))”).
```

The rest (,(year<2015 | (year== 2015 & month<= 11) | (year==2015 & month==11 & day<= 30)”) of the code excludes people who were born after the reference point.

This code can be modified to any reference point by replacing 2015, 11 and 30 to the desired date. ***