

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

<u>Component 3</u> Develop strategy for dealing with missing or erroneous data

Activity 3.1.2 Review methodology for treatment of missing values: Household statistics

> Mission carried out by Mr. Peter Stoltze, Statistics Denmark Mr. Kai Lorentz, Destatis Mr. Veli-Matti Törmälehto, Statistics Finland

Amman, Jordan

12-15 June 2023

Version: V1













Strengthening the capacity of Jordan's Department of Statistics

Authors' names, addresses, e-mails

Mr. Peter Tibert Stoltze Head of the Division for Methodology and Analysis Statistics Denmark Sejrøgade 11 DK-2100 Copenhagen Ø Denmark Tel: +45 3917 3827Email: <u>psl@dst.dk</u>

Dr. Kai Lorentz Head Section for Mathematical-Statistical Techniques for Household Surveys and Census Statistisches Bundesamt (Destatis). Gustav Stresemann Ring 11 DE-65189 Wiesbaden Germany Tel: +49 611 75 2589Email: <u>kai.lorentz@destatis.de</u>

Mr. Veli-Matti Törmälehto Senior Researcher, Information and Statistical Services, Social statistics Statistics Finland Työpajankatu 13 FI-00580 Helsinki Finland Tel: +358 29 551 3680 Email: <u>veli-matti.tormalehto@stat.fi</u>

Table of contents

1. General comments	5
2. Assessment and results	
3. Conclusions and recommendations	
Annex 1. Terms of Reference	
Annex 2: Programme for the mission	
Annex 3. Persons met	

List of Abbreviations

BC	Beneficiary Country
CoE	Census of Establishments
DoS	Department of Statistics
ESS	European Statistical System
GSBPM	Generic Statistical Business Process Model
HEIS	Household Expenditure and Income Survey
MS	Member State
LFS	Labor Force Survey
NSDS	National Strategy for the Development of Statistics 2018-2022
QPI	Quality and Performance Indicators
RTA	Resident Twinning Advisor
RTAA	Resident Twinning Advisor Assistant
RTALA	Resident Twinning Advisor Language Assistant
STE	Short Term Expert
ToR	Term of References

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". This was the second activity in Component 3: Strategy for dealing with missing or erroneous data aiming to contribute to Mandatory Result 3.1 Review current methodology for dealing with missing or erroneous data by sector, and make recommendations.

The purpose of this activity was to review current methodology for dealing with missing or erroneous data for key surveys for household statistics. This took outset in BC and MS expert jointly audit the production process for HEIS (Household Expenditure and Income Survey) and LFS (Labor Force Survey).

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 Finland, Statistics Denmark, or Statistisches Bundesamt (Destatis).

2. Assessment and results

The purpose of this mission (as described in the ToR, see excerpt in Annex 1) was to "review current methodology for dealing with missing or erroneous data for surveys in the household sector." That was exactly what was done during the mission.

Furthermore, presentations from MS on their practices concerning the LFS and HEIS surveys were given (see Annexes).

Concerning the expected outcomes of the mission (see ToR), we state the following:

• Expected Output 1: A common terminology is introduced

A presentation on Quality and Performance indicators (see ESS Guidelines for the implementation of the ESS Quality and Performance Indicators (QPI)) has been given (see Annex). Especially the indicator for unit non-response

$$NRr_{w} = 1 - \frac{\sum_{R} w_{j}}{\sum_{R} w_{j} + \sum_{NR} w_{j} + \alpha \sum_{Q} w_{j}}$$

has been presented and discussed extensively.

It was noted, that for the QPI's the quantitative descriptors must be supplemented with a qualitative description (text explaining other issues).

Also, the calculation of QPI's is always subject to domain specific interpretation ("how to apply a formulae in a specific context").

• Expected Output 2: Household Surveys scrutinized

This was carried out for the HEIS and the LFS surveys.

General observations for both HEIS and LFS:

- In general the MS experts where very impressed by the standards by which the HEIS and LFS are carried out at DoS.
- \circ The methodology is well aligned with ESS standards e.g. an effective sampling design.
- Survey very well organized with a very high number of contacts to households.

Specifically for the LFS:

DoS has an impressive response rate (in excess of 90 percent) and generally low item non-response, which make the topic of handling unit non-response and missing data less critical than in the HEIS.

Plausibility checks are implemented in electronic questionnaire and are quite advanced (and good for data quality).

Specifically for the HEIS:

HEIS uses paper questionnaire for practical reasons and based on careful considerations by the DoS staff. The scope for using administrative data on expenditure is very limited but in some parts (e.g. income, energy costs) there could be prospects toward this. In the medium term, the issue of using electronic questionnaires could be revisited. Collecting direct administrative identifiers in the HEIS questionnaire could be tested as well.

• Expected Output 3: Indicators for missing data calculated

Numbers for unit non-response in the HEIS where presented by DoS staff. The overall response rate of 72 % is relatively good compared to many European countries. However, increased unit non-response between 2017 and 2022 HEIS and substantial regional variation are a concern. Item non-response is in general low, but partial non-response in expenditure questions (i.e. not finishing the last part of the questionnaire) is an issue that could be further discussed (currently handled with reweighting but imputation strategy could be envisaged).

Also, a presentation and demonstration of the R-software carrying out the calculation of calibration weights for Jordan HEIS data was given (see Annex).

3. Conclusions and recommendations

- Include some key figures (QPIs, see above) in the quality report to help the user understand the quality of the survey.
- Specifically for the HEIS: It is recommended to update the quality report (Explanatory Document on the Published Data) for the 2022 survey.

Also, to describe the estimation process (including estimation of standard errors) in more detail.

Strengthening the capacity of Jordan's Department of Statistics

Furthermore, to assess the effect of winsorization of e.g. income (winsorization is the process of substituting values outside an acceptance region with the limit of this region) on the estimates.

- It is foreseen, that Activity 3.1.4 will cover calculation of specific QPI's across the various domains of Component 3 (business, households, agriculture). For practical reasons most of the work will be made by DoS staff prior to the mission because it is not realistic to do this during the mission since access to data etc. takes time and cannot normally be solved on a day-to-day basis.
- To invite staff members from DoS methodology and quality sections for the upcoming activities.

Annex 1. Terms of Reference

Terms of Reference

EU Twinning Project JO 21 ENI ST 01 22

Component 3: Develop strategy for dealing with missing or erroneous data

Activity 3.1.2:

Review methodology for treatment of missing values: Household statistics

Dates: 12 – 15 June 2023

Content

List of abbreviations	9
0. Objective and Mandatory Results for the component	10
Objective	10
Mandatory results and indicators for achievement for each sub-component	10
1. Purpose of the activity	11
Audit of the production process of the Household Surveys in DoS	11
Examination of pattern of non-response for last five years	11
2. Expected output of the activity	11
3. Participants	12
MS Short Term Experts (STE's):	
DoS experts:	15
Twinning team:	15
4. Resources	
5. Overall agenda	13
-	

Annex A. Program for the activity Annex B. Participants

List of abbreviations

BC	Beneficiary Country
CoE	Census of Establishments
DoS	Department of Statistics
ESS	European Statistical System
GSBPM	Generic Statistical Business Process Model
HEIS	Household Expenditure and Income Survey
MS	Member State
LFS	Labor Force Survey
NSDS	National Strategy for the Development of Statistics 2018-2022
QPI	Quality and Performance Indicators
RTA	Resident Twinning Advisor
RTALA	Resident Twinning Advisor Language Assistant
STE	Short Term Expert
ToR	Term of References

0. Objective and Mandatory Results for the component

Objective

The objective of component 3 of the Twinning project on statistics is to develop strategy for dealing with missing or erroneous data

Surveys are a key source for providing consistent measured information to compile accurate statistical outputs and to facilitate analysis. However, missing or erroneous data in surveys provide a significant challenge for statisticians, and can often undermine the level of confidence in survey-based results. Response rates and data quality have been identified as a problem for some DoS surveys. The Twinning project will examine the level of missing or erroneous data in DoS surveys, and develop strategies to improve data quality and increase response rates in those surveys most affected.

This component will focus on current procedures for dealing with missing or erroneous data. The first step is to undertake an assessment of current DoS surveys to identify those most affected by poor or inaccurate responses. A review of the reasons for poor response or non-response is then required. Based on the information collected, an action plan to address the issues raised will be prepared.

Component 3 is sub-divided in four sub-components each with a Mandatory Results (MR) and two to three indicators of achievements associated with the sub-component.

Mandatory results and indicators for achievement for each subcomponent

MR from the Twinning Fiche	Indicators of achievements (IA)
MR 3.1: Review current methodology for dealing with missing or erroneous data by sector, and make recommendations	 IA 3.1.A: Undertake review of level and quality of responses in DoS surveys and reasons underlying response rates IA 3.1.B: Review current methodology and devise action plan for delivering better quality survey data IA 3.1.C: Methodology for treatment of non-response, missing values etc. reviewed and updated
MR 3.2: Explore how administrative data can help update the farm register, improve the sampling framework for agricultural surveys and enhance agricultural statistics	 IA 3.2.A: Review completed on how administrative agricultural data can update farm register IA 3.2.B: More targeted and updated sampling framework developed IA 3.2.C: New statistical outputs on agriculture developed
MR 3.3: Review quality framework for survey data and make recommendations	IA 3.3.A: Enhanced quality framework developed IA 3.3.B: New Quality IAs developed by DoS
MR 3.4: Review and update training programs and manuals for DoS staff, and provide training to survey respondents	IA 3.4.A: Training programs, workshops, manuals developed for DoS staff and survey respondents IA 3.4.B: DoS leadership role on applying proper statistical standards reinforced

Table 1: Mandatory results and indicators for achievement (IA) for each sub-component within Component 3:

 Dealing with missing or erroneous data

1. Purpose of the activity

The purpose of this activity is to review current methodology for dealing with missing or erroneous data for key surveys for household statistics. This will take outset in BC and MS expert jointly audit the production process for HEIS (Household Expenditure and Income Survey) and LFS (Labor Force Survey) as well as examining the pattern of item and unit non-response for last five years.

Audit of the production process of the Household Surveys in DoS

The audit will be a professional jointly review by BC and MS experts of the production process of HEIS and LFS with focus on process steps that can affect non-response or erroneous data. In order to systemize the audit it will follow the production steps in the Generic Statistical Business Process Model (GSBPM). As preparation, the descriptions of the current methodology used in these two are provided by DoS.

Examination of pattern of non-response¹ for last five years

The examination of pattern of item and unit non-response for the last five year will be carried out for HEIS and LFS.

The examination of the will take outset in actual survey data collected by DoS over the last five years, and relevant quality and performance indicators will be calculated taking outset in ESS guidelines for the implementation of quality and performance indicators (QPI's).

2. Expected output of the activity

- A common terminology is introduced;
- Household Surveys have been scrutinized by BC and MS expert together;
- Indicators for missing data have been calculated for selected household surveys;

¹ Unit nonresponse refers to the complete absence of an interview from a sampled unit whereas item nonresponse refers to the absence of answers to specific questions in the interview after the sampled unit agrees to participate in the survey.

3. Participants

MS Short Term Experts (STE's):

- **Mr. Peter Tibert Stoltze**, Head of the Division for Methodology and Analysis, Statistics Denmark. Mr. Stoltze has for more than 15 years worked in various positions with methodology issues at Statistics Denmark and coordinates methodology (sampling), metadata and quality work. Mr. Stoltze has extensive experience in the field of survey sampling and estimation, data editing and imputation. In addition, Mr. Stoltze is experienced in design of surveys and strategies for maximizing response rates, and is experienced in providing support and training on methodological issues internationally. E-mail: psl@dst.dk
- **Dr. Kai Lorentz**, Head Section for Mathematical-Statistical Techniques for Household Surveys and Census, Statistisches Bundesamt (Destatis). Dr. Lorentz is currently responsible for sampling related issues in Census 2021, micro census, labour force survey, demographic survey, ICT usage. Before that, Mr. Lorentz hold a position as Assistant Head the Section for Mathematical statistical methods. Dr. Lorentz was responsible for sampling related issues in trade statistics, service statistics, tourism statistics, price statistics and transport statistics. E-mail: kai.lorentz@destatis.de
- Mr. Veli-Matti Törmälehto, Senior Researcher, Information and Statistical Services, Social statistics, Statistics Finland. Mr. Törmälehto has for more than 20 years worked in various positions in Statistics Finland related to development, production and reporting tasks on income and wealth distribution statistics. E-mail: <u>veli-matti.tormalehto@stat.fi</u>

DoS experts:

The Names of the Participants from the Household Income & Expenditure Division.

- Fatmeh Awamreh, <u>Fatmeh.Awamreh@DOS.GOV.JO</u>
- Sana AlMomani, <u>Sana.AlMomani@DOS.GOV.JO</u>
- Lina Al-Youmn, <u>lina.Al-youmn@DOS.GOV.JO</u>
- Karolean Hamad, <u>karolean.hamad@DOS.GOV.JO</u>
- Rania Abu Ghaith, <u>Rania.Abughaith@DOS.GOV.JO</u>
- Noor Naimat, <u>Noor.Naimat@DOS.GOV.JO</u>

The Names of the Participants from the Labour Force Division

- Jehan Alkaryouti, <u>Jehan.Alkaryouti@DOS.GOV.JO</u>
- Hamzeh Al Shawareh, <u>Hamzeh.alshawawreh@dos.gov.jo</u>
- Areej sbaihat, <u>Areej.sbaihat@DOS.GOV.JO</u>
- Rema Qwakza, <u>Rema.Quaqazeh@DOS.GOV.JO</u>
- Muneera Al Kassab, <u>muneera.alkassab@DOS.GOV.JO</u>
- Fasil Al Abadi Fasil.AlAbadi@DOS.GOV.JO
- Nehaya Obaidat, <u>nehaya2@DOS.GOV.JO</u>

Directorate of Methodologies and Research

- Ghaida Khasawneh, <u>ghaida@dos.gov.jo</u>
- Eman Bny Mfarej, <u>Eman.BnyMfarej@DOS.GOV.JO</u>

Strengthening the capacity of Jordan's Department of Statistics

- Derar Jawarneh, <u>derar.jawarneh@DOS.GOV.JO</u>
- Ayman Al Qasem, <u>Ayman.AlQasem@DOS.GOV.JO</u>
- Ahmad Dawagreh, <u>Ahmad.Dawagreh@DOS.GOV.JO</u>

Twinning team:

- Eng. Mohammad Khalaf, Director of Sustainable Development Unit, Department of Statistics (DoS), Jordan (RTA Counterpart) (<u>Mohammed.Khalaf@DOS.GOV.JO</u>)
- Mr. Mohammad AbelRazzaq, DoS Component Leader (<u>Mohammad.AbdelRazzaq@DOS.GOV.JO</u>)
- Ms. Charlotte Nielsen (RTA) (<u>cln@dst.dk</u>)
- Ms. Zaina Amireh (Language Assistant) (zainaamireh3@gmail.com)

4. Resources

DoS data for the last five years will be available for HEIS and LSF from the start of the activity, allowing calculation of indicators for missing data.

Translation and interpretation will be provided throughout the activity. Translation will be provided as sequential translation. Therefore, please keep frequent pauses when presenting and talking allowing the translator to provide as precise translation as possible.

All material will provide in both English and Arabic before, under and after the Mission. The venue will the Meeting room at DoS. Overhead projector, flip-overs and other office material will be available.

5. Overall agenda

Day 1: Introduction to methodology to household surveys and quality indicators Day 2: Audit of LSF Day 3: Audit of HEIS Day 4: Summary and conclusions

Annex 2: Program for the mission

Date	Venue	Time	Торіс
Monday	Training	09:30 - 10:00	Welcoming, acquaintance, program of the week
12 June 2023	center	10:00 - 12:00	MS: Introduction to methodologies used for
			household surveys in MS (Mr. Veli-Matti Törmälehto,
			Mr. Peter Stoltze, Dr. Kai Lorentz)
		12:00 - 13:00	Lunch break
		13:00 - 14:30	MS: Quality Performance Indicators used in MS (Mr.
			Peter Stoltze)
		14:30 - 15:00	MS: Introduction to the Audit process (Dr. Kai
			Lorentz)
Tuesday	Training	09:30 - 10:00	MS: Summary and conclusion from day 1
13 June 2023	center	10:00 - 12:00	BC and MS: Audit of LFS
			Moderator: Mr. Peter Stoltze
		12:00 - 13:00	Lunch break
		13:00 - 15:00	BC and MS: Audit of LFS continued
Wednesday	Training	09:30 - 10:00	MS: Summary and conclusion from day 2
14 June 2023	center	10:00 - 12:00	BC and MS: Audit of HEIS
			Moderator: Mr. Veli-Matti Törmälehto
		12:00 - 13:00	Lunch break
		13:00 - 15:00	BC and MS: Audit of HEIS continued
Thursday	Training	09:30 - 10:00	MS: Summary and conclusion from day 3
15 June 2023	center	10:00 - 12:00	MS and BC: Examine the pattern of item and unit
			non-response across surveys
		12:00 - 13:00	MS and BC: Summarizing the results and next steps
		13:00 - 14:00	Lunch break
		14:00 - 14:45	MS: Presentation of results for the management
		14:45 - 15:00	MS and BC: Evaluation of the mission and final
			remarks and thanks

Annex 3. Persons met

DoS experts:

The Names of the Participants from the Household Income & Expenditure Division.

- Fatmeh Awamreh, <u>Fatmeh.Awamreh@DOS.GOV.JO</u>
- Sana AlMomani, <u>Sana.AlMomani@DOS.GOV.JO</u>
- Lina Al-Youmn, <u>lina.Al-youmn@DOS.GOV.JO</u>
- Karolean Hamad, <u>karolean.hamad@DOS.GOV.JO</u>
- Rania Abu Ghaith, <u>Rania.Abughaith@DOS.GOV.JO</u>
- Noor Naimat, <u>Noor.Naimat@DOS.GOV.JO</u>

The Names of the Participants from the Labour Force Division

- Jehan Alkaryouti, Jehan.Alkaryouti@DOS.GOV.JO
- Hamzeh Al Shawareh, <u>Hamzeh.alshawawreh@dos.gov.jo</u>
- Areej sbaihat, <u>Areej.sbaihat@DOS.GOV.JO</u>
- Rema Qwakza, <u>Rema.Quaqazeh@DOS.GOV.JO</u>
- Muneera Al Kassab, <u>muneera.alkassab@DOS.GOV.JO</u>
- Fasil Al Abadi <u>Fasil.AlAbadi@DOS.GOV.JO</u>
- Nehaya Obaidat, <u>nehaya2@DOS.GOV.JO</u>

Directorate of Methodologies and Research

- Ghaida Khasawneh, <u>ghaida@dos.gov.jo</u>
- Eman Bny Mfarej, <u>Eman.BnyMfarej@DOS.GOV.JO</u>
- Derar Jawarneh, <u>derar.jawarneh@DOS.GOV.JO</u>
- Ayman Al Qasem, <u>Ayman.AlQasem@DOS.GOV.JO</u>
- Ahmad Dawagreh, <u>Ahmad.Dawagreh@DOS.GOV.JO</u>

Twinning team:

- Eng. Mohammad Khalaf, Director of Sustainable Development Unit, Department of Statistics (DoS), Jordan (RTA Counterpart) (<u>Mohammed.Khalaf@DOS.GOV.JO</u>)
- Mr. Mohammad AbelRazzaq, DoS Component Leader (<u>Mohammad.AbdelRazzaq@DOS.GOV.JO</u>)
- Ms. Charlotte Nielsen (RTA) (<u>cln@dst.dk</u>)
- Ms. Zaina Amireh (Language Assistant) (zainaamireh3@gmail.com)

Annex 4. Overview of presentations and supporting documents etc.

Material used during the mission is available as separate annexes numbered 4.1 to 4.9 as follows:

The following presentation where given during the mission:

- Annex 4.1: General features of household surveys at Statistics Finland (Mr. Veli-Matti Törmälehto)
- Annex 4.2: Estimation Techniques for the German household surveys (Dr. Kai Lorentz)
- Annex 4.3: Introduction to Quality and Performance Indicators (Mr. Peter Stoltze)
- Annex 4.4: An Overview of The Household Expenditure and Income Survey (HEIS)
- Annex 4.5: Labour Force Survey (LFS) at DoS

The following supporting documents where considered during the mission:

- Annex 4.6: Data Quality Management Guide in the Department of Statistics (DoS) 2017
- Annex 4.7: Quality report for HEIS
- Annex 4.8: Quality report for LFS

The following example was prepared and partly presented during the mission:

• Annex 4.9: HEIS Calibration Example