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 2
Methodology for producing Small Area Statistics

Activity: 2.1.4:
Practical implementation of small area estimation theory on Jordanian data

Mission carried out by
Dr. Danila Filipponi
Dr. Andreas Berg
Dr. Michele d'Alo

Amman, Jordan

24-27 June 2024

Version: Final

دائرة الإحصاءات العامة
Department of Statistics
STATISTICS DENMARK
Statistisches Bundesamt
Istat
STATISTICS LITHUANIA
STATE DATA AGENCY
Statistics Finland

Authors' names, addresses, e-mails

Ms. Danila Filipponi
Senior Researcher, Directorate for Methodology and Statistical Process Design.
Head of the unit: Labour Register,
The Italian National Institute of Statistics (ISTAT)
Via C. Balbo, 15
00184 Roma
Italy
Email: dafilipp@istat.it

Dr. Andreas Berg
Statistician
The Federal Statistical Office in Germany (Destatis)
Gustav-Stresemann-Ring 11
65819 Wiesbaden
Germany
Email: andreas.berg@destatis.de

Dr. Michele d'Alo
Head of a team in charge of small areas estimation and integration of data sources
The Italian National Institute of Statistics (ISTAT)
Via C. Balbo, 15
00184 Roma
Italy
Email: dalo@istat.it

Table of contents

List of Abbreviations

- BC – Beneficiary Country
- DoS – Department of Statistics
- MS – Member State
- PL – Project Leader
- RTA – Resident Twinning Advisor
- SAE – Small Area Estimation
- STE – Short-term Expert
- HEIS – Jordan Household Expenditure and Income Survey
- R – Software environment for statistical computing
- STATA – Software for statistical data analysis
- GREG – Generalised Regression

Executive Summary

Main conclusions and highlights from findings.

Following Mission 2.1.2 in February 2024, hands-on opportunities to work with data from the Jordanian HEIS were introduced for the first time. However, full access to the input data required for comprehensive analysis was limited to a single device.

Theoretically and practically relevant covariates were identified from a pre-mission, filtered questionnaire-based metadata set. Step-by-step working examples were then demonstrated in R across various hierarchical domains for the target variable *mean annual household expenditure.*"

The process began with the calculation of classical direct estimates, primarily GREG-type estimates, at the sub-district level. Subsequently, an initial area-level model was developed, and parameters were estimated. The results were compared with the direct estimates and discussed.

Next, a new area-level model was specified for the same target variable, focusing on a finer domain by cross-classifying sub-districts with nationality. This second model posed additional challenges in terms of quality and accuracy. Advanced model manipulation techniques were employed to address these difficulties, gradually improving the results. These improvements were analyzed and discussed in detail.

Further, important questions were raised regarding model selection, dissemination thresholds, benchmarking procedures, and reliability concerns. It was highlighted that gaining deeper theoretical and practical insights into these issues would be valuable for future missions.

In addition to these methodological considerations, the need for data availability across multiple laptops for all mission participants was emphasized for future missions. This would enable more efficient, group-based, hands-on work, which is expected to lead to outcomes that are more successful.

1. General comments

This mission report has been prepared as part of the Twinning Project, "Strengthening the Capacity of Jordan’s Department of Statistics in the Compilation, Analysis, and Reporting of Statistical Data in Line with International and European Best Practices." The current mission is part of Component 2, which focuses on the methodology for producing Small Area Statistics. All planned activities for this mission were carried out as scheduled.
The objective of this mission was to apply the small area estimation theory, introduced during the previous activity in February 2024, to Jordanian data. Specifically, small area estimates were applied to total household expenditure data from the 2017 Household Expenditure and Income Survey (HEIS), using sub-districts as the domain.
The practical application followed three broadly defined stages:

- Specification
- Data preparation
- Analysis and adaptation
- Evaluation

The consultants would like to express their sincere gratitude to all officials and individuals they met during their stay in Jordan for their kind support and the valuable information provided, which greatly facilitated the mission’s work. The views and observations expressed in this report are those of the consultants and do not necessarily reflect the views of the EU, ISTAT, or Destatis.

2. Assessment and results

For the first time, this mission allowed participants to work directly with real data from the Jordan HEIS, though access was physically limited to a single desktop device. Aggregated census data were used as auxiliary information to improve the precision of the estimates. However, due to the significant time gap between the survey and the census, concerns were raised about the validity of this information and the potential loss of estimation quality.
DoS experts prepared data for the mission, including:

- Calculating estimates and their relative coefficients of variation for the variable of interest—annual mean household expenditure—across various hierarchical domains (governorate, district, subdistrict levels).
- Aggregating a pre-selecting set of potentially useful auxiliary variables, which were further refined based on theoretical and practical considerations.

The coefficients of variation, even at the sub district level, were surprisingly stable and relatively small across all subdistricts. This indicated that the accuracy of the classical estimates was sufficiently reliable for dissemination purposes. Given that National Statistical Offices

around the world adopt different thresholds for publishing data based on coefficient of variation, there was a productive discussion about how DoS should establish appropriate thresholds for sub district-level results for the variables in focus.
Since the design-based procedures already yielded reliable results, small area estimation (SAE) was performed solely as an exercise. The team demonstrated the steps required to implement a Fay-Herriot model, including:

- Variable selection,
- Model assumption validation,
- Variable transformation to meet model assumptions,
- Smoothing of variance to account for estimated instability.

To showcase how small area models can improve the accuracy of estimates for small domains, a new area-level model was estimated for the same target variable, this time using a finer domain classification by cross-referencing subdistrict and nationality. Nationality was modeled as a binary variable (Jordanian and Non-Jordanian).

In several areas, the coefficient of variation for the direct estimates was very high due to small sample sizes, illustrating that classical direct estimation was no longer feasible. In addition, some of the small domains of interest were not included in the sample, meaning that no direct estimates were available for those areas.This situation necessitated the implementation of a small area estimation approach.

The model selection process in R, using stepwise regression, led to the construction of an area-level small area estimation model. Initially, the estimates performed poorly, indicating that the model assumptions may not have been met. Due to time constraints, not all potentially useful auxiliary variables were included in the stepwise regression process. It would be valuable to assess whether improvements could be achieved by incorporating the full set of variables.
Further steps were taken to improve the model, including transforming the dataset using a log-function and applying variance smoothing procedures. These efforts led to improved accuracy and stability of the estimates.

3. Conclusions and recommendations

This mission gave all the participants the opportunity to experience a thoroughly conducted small area analysis of the target variable in focus supported by HEIS and census data.
Reliable results have been produced.

At several stages lively discussions about a variety of topics emerged. As a conclusion the following list of urging problems which not to be addressed are:

- Improved data access allowing simultaneous hands-on training
- Advanced training on special SAE packages in R
- Calculation of synthetic non-model based estimates
- Deeper understanding of benchmarking/coherence/calibration in combination with implementation in R
- Training on model selection techniques
- How to choose sensible thresholds for coefficients of variance suitable for dissemination guidelines
- Developing guidelines on how to develop small area estimates

Strengthening the capacity of Jordan's Department of Statistics

Actions needed for moving forward as well as for preparing the next mission –add rows as needed.

Action	**Deadline**	**Responsible person**
Prepare all necessary data to be accessible from multiple laptops for all mission participants	Before the next mission	DoS experts
Write R guidelines on developing small area estimates	Before the next mission	STE

Annex 1: Terms of Reference

Terms of Reference

EU Twinning Project JO 21 ENI ST 01 22

Component 2:
Methodology for producing Small Area Statistics

Activity 2.1.4:
Practical implementation of small area estimation theory on Jordanian data

Dates: 24-27 June 2024

Content

List of abbreviations

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

0. Objective and Mandatory Results for the component

Objective

To review and develop the source data and methodology for producing Small Area Statistics.

Mandatory results and indicators for achievement for each sub-component

Table 1: *Mandatory results and indicators for achievement for each sub-components within Component 2: Methodology for producing Small Area Statistics (SAS). Please be aware that despite not being explicit defined in the current mandatory results this current Missions will focus on producing SAS on expenditure.*

MR from the Twinning Fiche	**Indicator**
MR 2.1: Pilot project to assess inclusion of administrative and other external data sources in the development of SAS and action plan developed.	**Indicators 2.1.A:** Administrative and other data sources investigated and their potential assessed **Indicators 2.1.B:** Action Plan for inclusion of administrative data prepared
MR 2.2: Develop methodology for producing SAS on expenditure and provide recommendations on how this methodology can be applied to other areas within the DoS.	**Indicators 2.2.A:** Methodology proposed including the potential use of modelling techniques, building on work in 2.1 above **Indicators 2.2.B:** Analysis completed on how new methodology can be expanded to other statistical areas
MR 2.4: Tools for dissemination of small area statistics on the DoS website assessed and demonstrated	**Indicators 2.4.A:** The possibility of updating to the newest version PxWeb explored **Indicators 2.4.B:** Use of PxWeb Application Programming Interface (API) demonstrated **Indicators 2.4.C:** The possibility of updating functionalities of management system WordPress explored

2. Purpose of the activity

The purpose of use the theoretical introduction on small area estimation given at the last activity in February 2024 on Jordanian data. The Mission will take outset in total household expenditure data from the Household Expenditure and Income Survey (HEIS) from 2017 and using sub-districts as the domain

The subjects that covered are:

- The practical application will take outset in the following three broadly defined stages:
  - Specification
  - Prepare data sources
  - Analysis and adaptation
  - Evaluation

3. Expected output of the activity

- Activity report;
- The data situation in DoS has been reviewed for their potential to be used as auxiliary information evaluated;
- Data prepaired
- Practical experiences with small area estimation obtained;

4. Participants

MS Short Term Experts (STE's)

- **PhD Ms. Danila Filipponi**, Head of the Labour Register Unit, Directorate for Methodology and Statistical Process Design, The Italian National Institute of Statistics (ISTAT) (MS Component Leader). Ms. Filipponi holds a PhD in Statistics and has a long and established experience in the field of Small Area Estimation (SAE) and for using administrative data as auxiliary information for SAE. In addition Ms. Filipponi has a long and established experience using R for SAE. E-mail: dafilipp@istat.it

- **PhD Michele d'Alo,** Head of a team in charge of small areas estimation and integration of data sources, The Italian National Institute of Statistics (ISTAT). Mr. d'Alo has a long and established experience in the field of Small Area Estimation (SAE). Application of SAE methods and techniques to the main household surveys. Methodological issues related to multi-source data frameworks. Use of SAE to produce estimates of SDG indicators at a very disaggregated level. Long and established experience in the field of Small Area Estimation (SAE). Application of SAE methods and techniques to the main household surveys. Methodological issues related to multi-source data frameworks E-mail: dalo@istat.it

- **PhD Mr. Andreas Berg,** Statistician Federal Statistical Office of Germany (Destatis). Mr. Berg hold a PhD in Statistics and has solid experience in the field of Small Area Estimation (SAE). As a statistician, Mr. Berg is familiar with various statistical analysis packages and numerous statistical mathematical-statistical methods. E-mail: Andreas.Berg@destatis.de

DoS experts (Tentative list)

- **Ms. Fatima Awamreh**, Head of Household Expenditure and Income Division (BC Component Leader). E-mail: Fatmeh.Awamreh@DOS.GOV.JO
- **Ms. Sana Al-Momani**, Household and Population Surveys Directory. E-mail: Sana.AlMomani@DOS.GOV.JO
- **Eng. Mohammad Khalaf**, Director of Sustainable Development Unit, Department of Statistics (DoS), Jordan (RTA Counterpart) and trainer in R and basic statistics. E-mail: Mohammed.Khalaf@DOS.GOV.JO
- **Ms. Roqayah Alsanabra**, Directorate of Methodologies and Data Division, Quality Assurance Division E-mail: Roqayah.Alsanabra@DOS.GOV.JO;
- **Abrar Qudah**, E-mail: Abrar.Qudah@DOS.GOV.JO;
- **Ms. Rania Abu Dhaim,** E-mail: Rania.AbuDhaim@DOS.GOV.JO;
- **Wafaa Amer**, E-mail: Wafaa.Amer@DOS.GOV.JO;
- **Walaa AlHadidi**, Walaa.AlHadidi@DOS.GOV.JO;
- **Mr. Raed Salameh,** E-mail: Raed.Salameh@DOS.GOV.JO;
- **Nusaibh Abdullah**, E-mail: Nusaibh.Abdullah@DOS.GOV.JO;
- **Tamadhor Ali**, , E-mail: Tamadhor.Ali@DOS.GOV.JO;
- **Ram Zayed**, E-mail: Ram.Zayed@DOS.GOV.JO;

Twinning team

- **Dr. Charlotte Nielsen** (RTA). E-mail: cln@dst.dk
- **Ms. Zaina Amireh** (Language Assistant). E-mail: zainaamireh3@gmail.com
- **Ms. Thekra Altorah** (RTA Assistant) E-mail: thekra.twinning.rtaa@gmail.com

5. Resources

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 our project translator to provide as accurate a translation as possible.

All material will be provided in both English and Arabic before, under and after the Mission.

The venue will be the Meeting room at DoS. Flip-overs and other office material will be available. DoS participants will bring laptops where R and R studio is installed

6. Overall agenda

- Day 1: Specification
- Day 2: Prepare data sources
- Day 3: Analysis and adaptation
- Day 4: Evaluation, summing up and and conclusions

7. Experiences in DoS on SAE and current status

Why the need for SAE in Jordan

In Jordan, small area estimation is important in the light of the increasing demand for statistical output for small geographic areas and sub-population groups. It is also important for the purposes of monitoring Sustainable Development Indicators. Traditional sample survey design does not contribute in obtaining direct small area estimations, instead valid statistical models can provide more accurate data for small areas and small populations. This component will focus on small area estimation related to expenditure in a way so the methodology, over time, can be expanded to other statistical areas and domains within DoS.

Experiences with SAE in DoS

In the past the Department of Statistics (DoS) has in particular addressed Small Area Estimation (SAE), in relation to poverty as derived from the Household Expenditure and Income Survey (HEIS), using weights from the Population and housing census from 2015. The estimation was based on methods introduced in a former project by the Word Bank using STATA as the analytic tool. The HEIS was designed at the 12 governorates in Jordan. However, the method is not appropriate for developing statistics for smaller areas, as required by policy makers. As part of the Twinning project the basic theory for small estimation was introduced and exemplified in R by using synthetic data provided by the MS in February 2024.

HEIS 2017

For information kindly consult the following Annexes

- Annex A - HEIS Questionnaire 2017 (ENG)
- Annex B - Introduction to HEIS in Jordan (ENG)
- Annex C - Sample Size for HEIS 2017
- Annex D – HEIS Survey sample documentation

Data to be prepared from HEIS 2017 before the Mission:

Microdata on households and individual level:

- Governorate
- District
- Sub-district
- ID of individual
- ID of household
- All expenditure variables
- Total expenditure
- All variables that are available in both HEIS 2017 and Population and housing census 2015
- Direct estimates and at sub-district level

Population and housing census 2015

For information kindly consult the following Annex E

Data to be prepared Population and housing census 2015 before the Mission:

Aggregated data on sub-district level – variable list provide in Table 2 of this ToR (Page 11-16)

Currently available administrative data sources in DoS

Administrative data for persons and households

- Civil Status and Passport Department (44 variables available)
- Social Security (6 variables available)
- Ministry of Higher Education and Science (16 variables available)
- Ministry of Education (16 variables available)
- Ministry of Health Insurance Department (15 variables available)

Administrative data for businesses

- The Ministry of Industry and Trade (MIT) (16 variables)
- The Companies Control Department (CCD) (10 variables)
- The Social Security Corporation (SSC) (28 variables)

Administrative data for Dwelling and housing

- The Ministry of Local Administration (x variables)
- Greater Amman Municipality (x variables)

Standardized hierarchical coding for geographical location used in DoS

In Jordan a national agreed on hierarchical coding for are used by all administrative data sources. The code consist of 15 digits to place the units to the geographical levels listed below (Map for Governorate are shown to the left):

- 3 digits – Country code (e.g. 101 for Jordan)
- 2 digits – Governorate (Altogether there as 12 Governorates in Jordan (can be clustered into Amman; South and North)
- 2 digits – District
- 1 digit – Sub-district
- 3 digits – City/Village
- 2 digits – Area
- 2 digits – Sub-Area

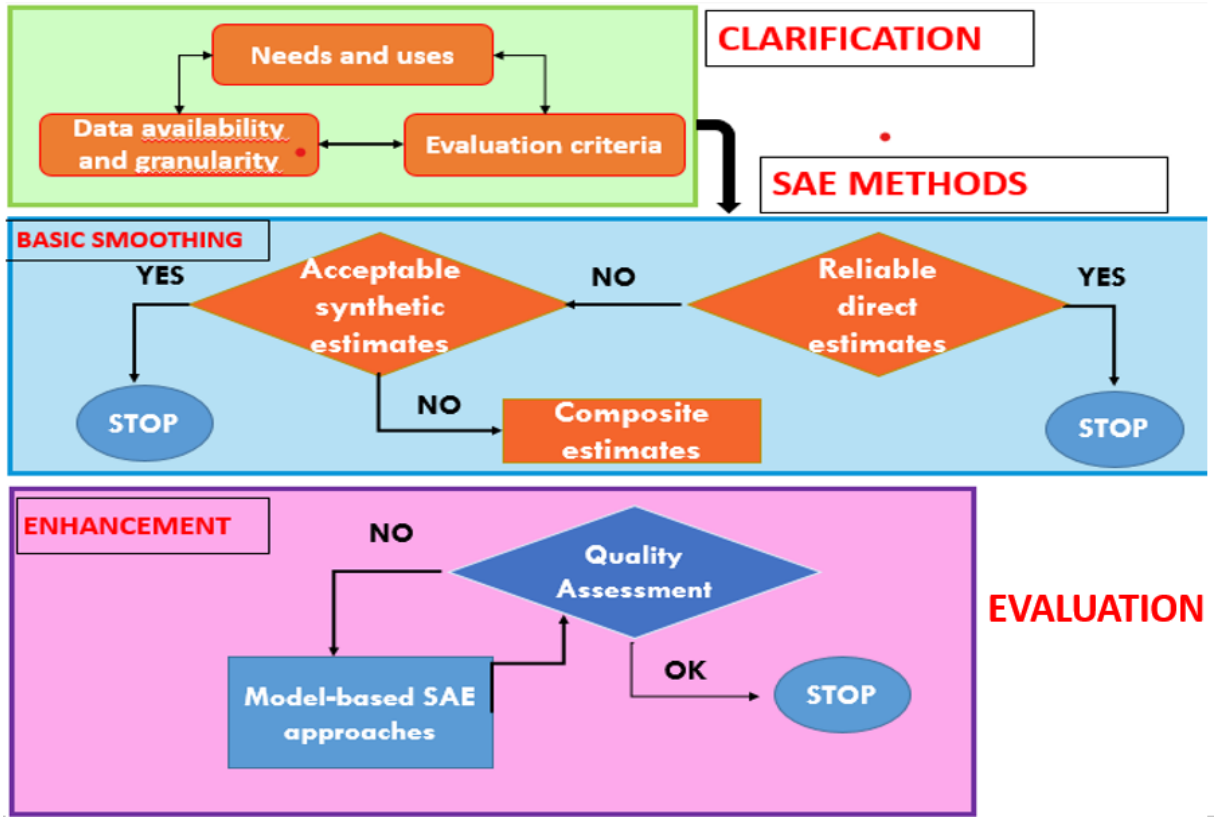
Figure 1: *Hierarchical coding of geographic information used in DoS.*

Basic training provided before the Mission

Basic training provided for 12 staff members in DoS by Eng. Mohammad Khalaf, Director of Sustainable Development Unit, Department of Statistics (DoS) before restarting component 2 – all topics have been exemplified using R.

1. Basic elements of probability theory. Concepts of sample space, events, probability axioms, and properties of probability and conditional probability.
2. Random variables. Discrete and continuous random variables, their distribution functions, expected values, variances, covariances, and other characteristics.
3. Main probability distributions. Binomial, Poisson, Gaussian, exponential and other distributions. Their properties and possible applications.
4. Sampling distributions. Distribution of the sample mean, sample variance, and sample proportions. Central limit theorem and its implications.
5. Estimation. Point estimation and interval estimation. Methods for estimating (infinite) population parameters, including maximum likelihood estimation and method of moments. The properties of estimators such as unbiasedness, efficiency, and consistency.
6. Hypothesis testing. Formulating and testing statistical hypotheses. Common tests like t-tests and chi-square tests.
7. Confidence intervals. Constructing confidence intervals for (infinite) population parameters.
8. Descriptive statistics. Main measures of central tendency and dispersion, percentiles, frequency distributions, cross-tabulation, and graphical summaries.
9. Simple and multiple linear regression. Introduction to regression analysis, model assumptions such as linearity, independence, and homoscedasticity/heteroscedasticity, least squares estimation, weighted least squares estimation, interpretation of regression coefficients, goodness-of-fit measures, hypothesis testing in regression, and model selection techniques.
10. Mixed models. Understanding simple linear mixed models.

Process flow used for SAE introduced in DoS



Strengthening the capacity of Jordan's Department of Statistics

Table 2: *Table of aggregated data from the population and housing census, 2015 to be used as auxiliary information for SAE of expenditure*

- Green aggregates: Has to be available on Monday 24 June 2024
- Blue aggregates: Sometimes during the Mission week
- ~~Cross our variables:~~ Maybe at a future Mission

Questionnaire no	**Comment**		**Question (UK)**	**Question (AR)**	**Variable name**	**Code list (UK)**	**Code list (AR)**	**Aggregates to be calculated at sub-district level** (Q103)
~~E111~~	~~Limited use for male/female~~		~~Summary of household members~~ ~~*Inside Jordan*~~ ~~• Total; Male; Females~~ ~~*Jordanians abroad*~~ ~~• Total; Male; Females~~					~~Total number of each category in each sub-district~~
~~L300~~			~~Number of housing units in the building~~					~~Average no?~~
~~L305~~			~~Number of HHs in the HU at time of listing~~					~~Average no?~~
204			Relation to head of Household			0. Head of HH 1. Husband/Wife 2. Son/ daughter 3. Father/mother 4. Grandchild 5. Brother/sister 6. Other relative 7. Maid 8. Others	0. رب الأسرة 1. زوج / زوجة 2. ابن / ابنة 3. أب / أم 4. حفيد / حفيدة 5. أخ / أخت 6. أقارب آخرون 7. خادم / خادمة 8. آخرون	Total number of each category pr sub-district
X			Calculation					Total number of individuals and households per sub-district
205			Sex			1.Male 2.Female	1. ذكر 2. أنثى	Total number of each category pr sub-district
206	As a proxy for age.		Date of Birth					Calculate the total number of individuals in each age class for each sub-district At least 5 age groups. DoS decide on age groups
209			Nationality	الجنسية			Jordanians/non Jordanian	Total number of each category pr subdistrict?

210		Does (name) have a health insurance?	نوع التأمين الصحي		0. No insurance 1. Ministry of health 2. Royal medical services (military) 4. university hospitals 8. UNRWA 16. private insurance 32. other (specify) 64. outside Jordan	0. غير مؤمن 1. وزارة الصحة 2. الخدمات الطبية الملكية 4. المستشفيات الجامعية 8. وكالة الغوث 16. تأمين خاص 32. أخرى (حدد) 64. خارج الأردن	Total no of individuals in each subdistrict having a health insurance and not having a health insurance (Cat =0)
~~217~~		~~Is (name of person) am asylum seeker?~~	~~هل يعتبر (اسم الفرد) في حالة لجوء؟~~				
221		Is (name of person) currently enrolled or ever been to educational institutions?	هل (اسم الفرد) ملتحق حاليًا أو سبق له الالتحاق بمؤسسة تعليمية بما في ذلك الروضة؟		1. Yes, currently enrolled 2. Yes, enrolled before 3. N0	1. نعم، ملتحق حاليًا 2. نعم، سبق له الالتحاق 3. لا	Total number of individuals in each category 2 categories: 1; 2+3;
~~222~~		~~Stage~~	~~المرحلة~~		~~0. Kindergarten~~ ~~1. Primary~~ ~~2. Vocational education~~ ~~3. Secondary~~ ~~4. Medium diploma~~ ~~5. Bachelor~~ ~~6. Higher diploma~~ ~~7. Master~~ ~~8. Doctorate~~	~~0. رياض أطفال~~ ~~1. أساسي~~ ~~2. تلمذة مهنية~~ ~~3. ثانوي~~ ~~4. دبلوم متوسط~~ ~~5. بكالوريوس~~ ~~6. دبلوم عالي~~ ~~7. ماجستير~~ ~~8. دكتوراه~~	~~Proportion of individuals enrolled in each category ?~~
~~223~~		~~Grade / schooling year~~	~~الصف / السنة الدراسية~~				~~?~~
224		What is the sector of the educational institutions that (name of person) is currently enrolled in?	ما هي الجهة التي تتبع لها المؤسسة التعليمية التي يلتحق بها (اسم الفرد) حاليًا؟		1. Governmental 2. Private 3. UNRWA 4. Outside Jordan 8. Don't know	1. حكومية 2. خاصة 3. وكالة الغوث 4. خارج الأردن 8. لا أعرف	Number of individuals in each category: 4 categories: 1+3; 2 4 8

225		Educational attainment	الحالة التعليمية		1. Illiterate 2. Read and write 3. Elementary (6 year) 4. Preparatory (9 years) 5. Basic (10 years) 6. Vocational education 7. High school 8. Middle diploma 9. Bachelor degree (BSC) 10. Higher diploma 11. Master 12. Doctorate	1. أمي 2. ملم (يقرأ ويكتب) 3. ابتدائي 4. إعدادي 5. أساسي 6. تلمذة مهنية 7. ثانوي 8. دبلوم متوسط 9. بكالوريوس 10. دبلوم عالي 11. ماجستير 12. دكتوراه	Number of individuals in each category: x categories: 1+2 2, 4, 5, 6 7 8+9 10+11+12
227		Marital status	الحالة الزواجية		1. Single (never married) 2. Married 3. Divorced 4. Widowed 5. Separated	1. أعزب / عزباء (لم يسبق له الزواج) 2. متزوج / متزوجة 3. مطلق / مطلقة 4. أرمل / أرملة 5. منفصل / منفصلة	Number of individuals in each category: 3 categories: 1 2 3, 4 5
~~228~~	~~Limited~~	~~What is the age at the first marriage? (completed years)~~	~~ما هو العمر عند الزواج الأول (بالسنوات الكاملة)؟~~				~~?~~
235		Does (name of person) have a permanent or temporary job, or perform any productive or service activity irrespective of cash or kind earning?	هل لدى (اسم الفرد) أي عمل دائم أو مؤقت أو يمارس أي نوع من الأنشطة أو الأعمال الإنتاجية أو الخدماتية بغض النظر عما إذا كانت تدر دخلاً نقديًا أم عينيًا؟		1. Yes, has a permanent job 2. Yes, has a temporary job 3. Yes, works in seasons 4. Performs irregular jobs/ business, or daily worker or occasional 5. Has no job and looking for a job 6. has no job and does not look for it	1. نعم، لديه عمل دائم 2. نعم، لديه عمل مؤقت 3. نعم، يعمل في المواسم 4. نعم، يمارس أعمال غير منتظمة: متقطعة أو بالمياومة أو المقاولة أو عرضية 5. ليس لديه عمل ويبحث عن عمل 6. ليس لديه عمل ولا يبحث عن عمل	Number of individuals in each category for each of the six categories:
501		Solar heater	سخان شمسي				Number of households having the item at sub-district level
502		Oven / cooker / gas	فرن/طباخ/غاز				Number of households having the item at sub-district level
503		Microwave	ميكرويف				Number of households having the item at sub-district level
504		Private car / truck/ bus	سيارة خاصة / بك أب/باص				Number of households having the item at sub-district level
505		Air conditioner	مكيف				Number of households having the item at sub-district level
506		Dishwasher	جلاية صحون				Number of households having the item at sub-district level
507		Energy saving bulbs	لمبات توفير الطاقة				Number of households having the item at sub-district level
508		Telephone	خط هاتف أرضي				Number of households having the item at sub-district level

509		Mobile phone	هاتف نقال عادي				Number of households having the item at sub-district level
510		Smart mobile phone	هاتف نقال ذكي				Number of households having the item at sub-district level
511		PC / laptop	كمبيوتر شخصي / محمول				Number of households having the item at sub-district level
512		Tablet	كمبيوتر لوحي (Tablet)				Number of households having the item at sub-district level
513		Internet subscription	اشتراك إنترنت				Number of households having the item at sub-district level
401		Tenure of housing	نوع حيازة المسكن		1. Owned by the household or member/s 2. Rented (without furniture) 3. Rented (furnished) 4. Owned by relative 5. For work 6. Free of charge 7.Others (specify)	ملك الأسرة أو أحد أفرادها مستأجر مفروش ملك لأحد الأقارب مقابل عمل دون مقابل أخرى (حدد)	Number of households in each category per sub-district: 3 categories: 1 2+3 The remaining
402		Monthly rent (of the tenant housing) in JD	الإيجار الشهري للمسكن المستأجر بالدينار؟		Monthly rent	الإيجار الشهري	Number of households in each category per sub-district: Sana define groups – propose low, medium and high
~~404~~		~~Space / area of HU (m^2)~~	~~مساحة المسكن بالمتر المربع~~		~~Space~~	~~المساحة~~	Number of households in each category per sub-district: Sana define groups – propose small, medium and large
405		Total number of rooms	عدد الغرف الكلي في المسكن		Rooms	عدد الغرف الكلي	No of rooms/ No. of individual in the household Average in each sub-district
~~406~~		~~Number of bedrooms~~	~~عدد غرف النوم بالمسكن~~		~~Bedrooms~~	~~عدد غرف النوم~~	~~?~~
~~407~~		~~Major source of drinking water~~	~~المصدر الرئيسي لمياه الشرب~~		~~1. Public network~~ ~~2. Filter inside house~~ ~~3. Tanks~~ ~~4. Rain water~~ ~~5. mineral water (filtered)~~ ~~6. Artesian well~~ ~~7. Spring~~ ~~8. Others (specify)~~	~~الشبكة العامة~~ ~~فلترة داخل المنزل~~ ~~صهريج~~ ~~بئر جمع / مياه أمطار~~ ~~مياه معدنية / منقاة~~ ~~بئر ارتوازي~~ ~~نبع~~ ~~أخرى (حدد)~~	~~Number of households in each category per sub-district:~~ ~~3 categories:~~ ~~1~~ ~~2+3~~ ~~The remaining~~

408		Type of sanitation	نوع الصرف الصحي		1. None 2. Public network 3. Absorbency hole 4. Other (specify)	لا يوجد الشبكة العامة حفرة امتصاصية أخرى (حدد)	?
409		Type of heater	نوع التدفئة الرئيسي		0. None 1. Central heating 2. Kerosene/diesel heater 3. Electric heater 4. Gas heater 5. Air conditioner 6. Wood / coal 7. Other (specify) 8. No need for heating	لا يوجد مركزية مدفأة كهربائية مدفأة غاز مكيف حطب / فحم أخرى (حدد) لا حاجة للتدفئة	

Annex 2. Program of the Mission

- Day 1: Specification
- Day 2: Prepare data sources
- Day 3: Analysis and adaptation
- Day 4: Evaluation, summing up and and conclusions

Annex 3. Persons Met

- Ms. Fatima Awamreh
- Ms. Sana Al-Momani
- Ms. Roqayah Alsanabra
- Mr. Ayman Al Qasem
- Ms. Nisreen Alaween