TWINNING CONTRACT

CRIS 2015/370-467

Support to the Israeli Central Bureau of Statistics in Improving the Quality of Official Statistics

STUDY VISIT REPORT

on
Methodological and –geo-spatial tools for improving the quality and efficiency of field surveys

Activity D5
Study visit to Central Statistical Office of Poland (CSO)

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List of Abbreviations

AES	Adult Education Survey
BC	Beneficiary country
BDR	Building and dwelling register
CAII	Computer-Assisted Internet Interviewing
CAPI	Computer-assisted Personal interviewing
CATI	Computer-Assisted Telephone Interviewing
CAWI	Computer-Assisted Web Interviewing
CAxI	Common name for all computer assisted data collection interviewing methods
CoP	European Statistics Code of Practice
CPU	Central Person Register
CSO (GUS)	Central Statistical Office of Poland
EHIS	European Health Interview Survey
ESS	European Statistical System
EU	European Union
EU-SILC	EU Statistics on Income and Living Conditions
GIS	Geographic information system
GSBPM	Generic Statistical Business Process Model
HBS	Household budget survey
ICBS	Israeli Central Bureau of Statistics
ICT	Information and communication technology
IT	Information Technologies
LSF	The European Union Labour Force Survey
MS	Member State (of the EU)
NSI	National Statistical Institute
NSS	Polish national Statistical System
OECD	Organisation for Economic Cooperation and Development
ONA	Other National Authorities
PAPI	Paper-Assisted Personal Interviewing
PSU	Primary statistical Unit
SSU	Secondary Statistical Unit
ToR	Terms of Reference
TERYT	The National Official Register of the Territorial Division of the Country
TUS	Time Use Survey
UN	United Nation

Summary of the study visit

In May 2017 six ICBS staff members and the Resident Twinning Advisor (RTA) visited the Central Statistical Office of Poland (CSO) – one of the most experienced MS countries in implementing geo-spatial tools for improving the quality and efficiency of field surveys. The ICBS staff consisted of representatives from the Survey Department, the GIS Unit and the Methodology Department since their cooperation and contribution are essential for a successful implementation of the vision of ICBS for management and monitoring of field surveys in the future.

The study visit served as a necessary step to proceed with the already initiated work at ICBS related to the preparations for using geo-spatial tools for improving the quality and efficiency in multi-field surveys by implementing GIS tools.

During the study visit the Israeli delegation met with staff members from CSO in Warsaw and from the Statistical Computing Centre in Radom. The study visit gave the Israeli delegation a wealth of valuable ideas and inspiration for future improvement of the quality and efficiency of multi-field surveys by implementing GIS tools.

The most significant achievement from the study visit was that it allowed the participant to meet with staff members with different expertise and responsibility of fields surveys as well as getting live demonstrations of central tools used by the CSO in particular (a) TERYT – The National Official Register of the Territorial Division of the Country and (b) CORstat a GIS based system for managing surveys and interviewers.

Below some of the highlights are summarized

- *CSO runs a large logistical operation with multi-surveys, 16 survey districts and thousands of interviewers and support personnel.*
- *As an EU member state Poland is obligated to fulfil EU requirements and legislation and thus give them the legitimacy to take actions. Every year an annual survey plan is authorized by a council of ministers.*
- *The administrative geographical hierarchy in Poland is very similar to the approach taken in Israel, from national to statistical areas.*
- *In Poland, the survey population is sampled from the building and dwelling register (TERYT) that include all buildings in Poland. This register is based on a large field operation that was conducted as a preparation for the last census. This is different from Israel where samples are taken from the Building and dwelling register (BDR) and the Central Person register (CPU). Like in Israel, each individual survey is sampled separately.*
- *All surveys are run through a central survey management system - CORstat – a system that does support all collection methods (CAII, CATI and CAPI). Basic queries are available and user friendly icons are used. The system is easy, simple and unsophisticated compared to existing ones in the ICBS. ICBS find that its main strength is the fact that it combines all the relevant actions together for field work.*
- *The interviewers work online using mobile tools including an emergency button. This is a major strength that contributes to field management and the interviewer's safety.*
- *Interviewers work on multi surveys - both social and business surveys. Interviewers work full time in Poland, whereas in Israel they work part time.*

- *For each survey CAII is available for a short period of time and then CATI and CAPI are conducted. In particular for business surveys this approach has proved to be successful. For social surveys this approach is less effective with only 2% using CAII. In the census 7% of the full questionnaire were completed by CAII and for the short questionnaire a bit more name 12%.*
- *GIS tools are implemented by the representation of X,Y-cordinates of each sample unit and interviewer.*
- *For censuses, in this context the population census and the agricultural census, allocation and management are conducted by enumeration areas. GIS was a component used for managing and monitoring. This is a separate system developed for the census and not a part of the surveys conducted annually.*
- *A platform for daily work plan for each interviewer in the field is about to be launched, both for the convenience of the interviewer and for supervision and safety. This platform is not included in CORstat yet but pre-version were demonstrated by Statistical Computing Centre in Radom.*
- *GIS is also used for publication of data as required by the EU. The data supplied is from district to locality.*

1. General comments

This study visit report was prepared within the Twinning Project ”Support to the Israeli Central Bureau of Statistics (ICBS) in enhancing the Quality of Official Statistics (CRIS 2015/370-467)” and organized under component D: *Methodological and – geo-spatial tools for improving the quality and efficiency of field surveys*.

During the study visit the Israeli delegation[1] met with staff members from Central Statistical Office of Poland (CSO) in Warsaw and Random. The study visit served as a necessary step to proceed with the already initiated work at ICBS related to the preparations for using geo-spatial tools for improving the quality and efficiency in multi-field surveys by implementing GIS tools. The main topics covered were:

1. The work flow within the CORstat system
2. The combination between field surveys, each with its specific constraints
    - Organizational side
    - How does the CSO allocate workload to interviewer at a practical and operational level for multiple surveys taking into account constrains between surveys – e.g. time frame of each survey has to be completed in, length of time needed for each surveys, travel time, etc
    - How does the CSO combine household surveys and person surveys
    - How does the CSO build your frame. Do you start out with yearly workload allocation or weekly/monthly workload allocation
    - How does the CSO ensure that the burden on individuals/household is acceptable
    - Training/knowledge needed for each survey both when it comes to managers and interviewers
    - How does the CSO prioritize between surveys and how do you update plans etc
3. Presentation of field allocation and monitoring views.
4. Monitoring dashboard for field supervisor.
5. Sampling procedures and multi survey sampling at CSO.
6. Software requirements and architecture of CORstat System.
7. Integrating GIS components as an integral part of the whole system throughout all stages on all platforms (tablets, Headquarters managing and monitoring etc.)
8. Planning outsourcing: what is critical to leave inside the organization in order to have maximum control and what to outsource.

The study visit gave the Israeli delegation a wealth of valuable ideas and inspiration for future improvement of the quality and efficiency of multi-field surveys by implementing GIS tools.

The staff of Israeli Central Bureau of Statistics (ICBS) would like to express their thanks to all officials and individuals met for the kind support and valuable information which they received before, during and after the stay in Poland which highly facilitated the work.

This views and observations stated in this report are those of the participating staff of ICBS and do not necessarily correspond to the views of EU, Statistics Denmark or CSO.

[1] For participants please consult Annex D5 – 3 Persons Met Activity D5

2. Lessons Learned

2.1 The system of official statistics in Poland

Poland has a long tradition for performing censuses and producing statistics with the first countrywide population census in Poland performed as long ago as 1789 and with the establishment of Central Statistical Office in Poland (CSO) in 1918 with the responsibility for coordination of all national statistical surveys and data release.. Over the years there have naturally been multiple system changes in regards to organization, subordination, methodology and data release - arising from historical and social and economic factors; In particular in relation to the transformation of the Polish economy and society. Most recently the alignment of Polish statistics to international standards as defined by the UN, the OECD (in connection with joining the organization), and the ESS for the integration of Poland with EU.

The legal basis is the law on official statistics that takes the following elements into account:

- Professional independence
- Coordinating role of the CSO President (Programme of statistical surveys of official statistics as an instrument of coordination)
- Statistical confidentiality
- Access to the use of administrative data
- Equal, indiscriminate and simultaneous access to the statistical information as a rule

Other national legal acts of significance of statistics are:

- Personal data protection act
- Act on digitalisation
- Civil service act
- Regulation (EC) no 223/2009 of the European Parliament and of the Council on European statistics - including principles of European Statistics Code of Practice (CoP) as a determinant of NSS activities in the course of implementing European norms and standards.

The Institutional framework consist of the Polish National Statistical System (NSS) – coordinated by the CSO The system is composed of the official statistics services, Other National Authority (ONAs) and other participants conducting or co-conducting official statistics surveys to satisfy information needs of the state, society, the European Union, and international organizations.

The president is heading the central Statistical Office, 16 regional statistical offices, two Statistical Information Centers geographically separated from each other due to security, Statistical Publishing Establishment and Central Statistical Library (Figure 1).

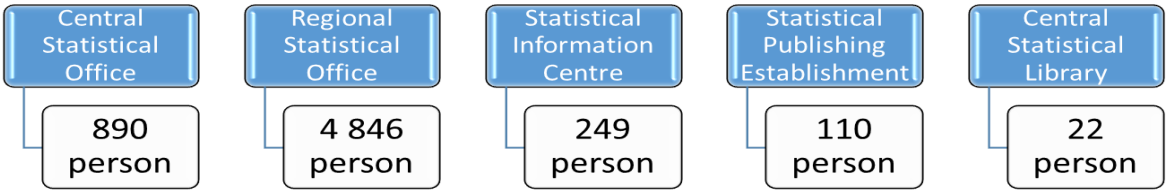

Figure 1: *Organizational structure of the CSO including number of employees*

The main coordinating instrument for the president is the Council of Ministers that on a yearly basis adapts a program for of statistical surveys of official statistics. The program consists of the annual surveys, terms and forms of data released that are planned in order to meet the national and international requirements.

At the CSO survey data are ensured by: electronic reporting, questionnaire, forms, administrative source and secondary use of data. Data storage has recently been extended from 2 to 10 years. Modern methods of data collection are used: Portal, CAWI, CATI, CAPI, on-line downloading. The new technology is recording. Data quality assessments are performed at the stage of processing and include control of data completeness, Control of data consistency and control of data continuity.

At the CSO the Generic Statistical Business Process Model (GSBPM) is used as the common framework for Quality and metadata management of statistics (Figure 2) and international model accepted by UNECE, Eurostat, OECD and thus ensure comparability to the rest of the world.

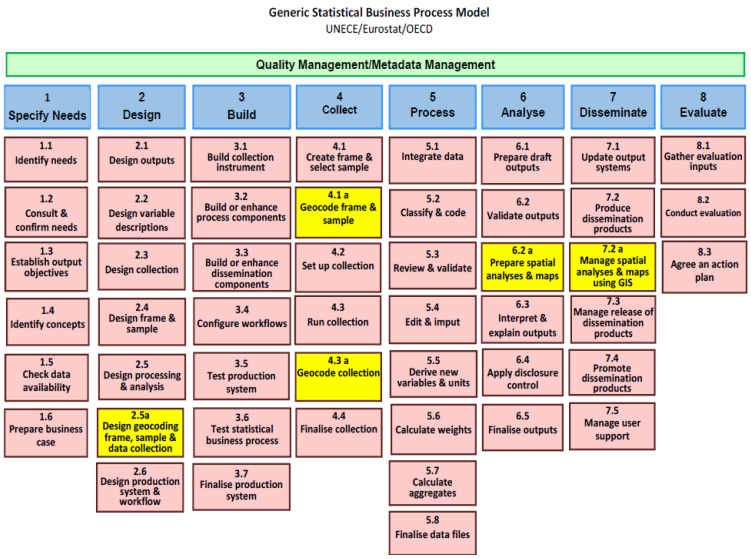

Figure 2: *The Generic Statistical Business Process Model (GSBPM) used in Poland*

2.2 Framework and experiences for multi-mode collection of survey data

The implementation of multi-mode collection of data with CAxl methods was first used for the census and has since then gradually been implemented into other surveys. The rationale behind the multi-mode collection process was to reduce costs, the workload on interviewers and giving the population a more flexible ways to participate in none mandatory surveys.

The process for the census was divided into the flowing steps:

1. Initially XY coordinates and addresses for all buildings were collected and registered in a common database. There can only be oone official address per building.
2. The census was promoted mass media, TV, commercials and internet and the population was encouraged to self-enumeration by CAII.
3. First step of the collection process was CAII in which case the forms provided for the respondent was partially filled in, in advance. Access to the form was granted via proof of identification for example questions e.g. place of birth of mother etc. The forms were individual, but one person could fill in questionnaire for all the family. The population that choose to respond by CAII were allowed correct pre-filled fields of the form and to fill in the empty entities. The CAII – self enumeration were allowed for 2.5 months after which this option were closed down.
4. CATI and CAPI were initiated a week after CAII ended. Non response was automatically recorded.
5. Participation by CAII and CATI were voluntary whereas participation in CAPI was mandatory.

From 2012 the multi-mode collection approach has been applied to all surveys although excluding the proof of identification in CAII. CAII has been most successfully introduced in the Household Budget Survey

(HBS) and in agricultural surveys. The period of CAII, the first days are devoted to CAII only but other means are introduced quickly because if someone wants to respond in a different way this options should be open.

The same questionnaire is used for all collection methods. The field interviewers used smart phones for census, they grew old and the screens were too small so the CSO later moved to using laptops and tablets. CSO do not experience any difference in preferences among interviewers between using laptops or tablets. Price and functionality are the top priorities so there is a tendency to using mainly tablets in the CSO.

A pilot for computerizing the booklet of HBS was well received by the respondent. In the pilot - a letter from the president was sent to the survey population encouraging them to fill in the questionnaire electronically. At the same time a hotline was launched so respondents were assisted if needed. When the questionnaire has been filled out electronically the questionnaire will be checked manually by the interviewers and the respondents will be contacted by phone if needed.

2.3 Estimations of need for interviewers in relation to workload

The pre-condition in the CSO is that all interviewers work full time which in Poland means 8 hours of work per day in a five days working week with 28 days of holiday per year. On each day it is assumed that that the interviewer spends in average 4 hours on interviews and 4 hours on all other activities like transportation, training etc.

In Poland the months of January, April, June and July are the most intensive months in respect to workload since several surveys are conducted during those months (Figure 3-5).

In months with under coverage of workload, the interviewers spend their excess time on training either on site classes, e-learning and mobile-learning. The training is conducted for all surveys and throughout the hierarchy.

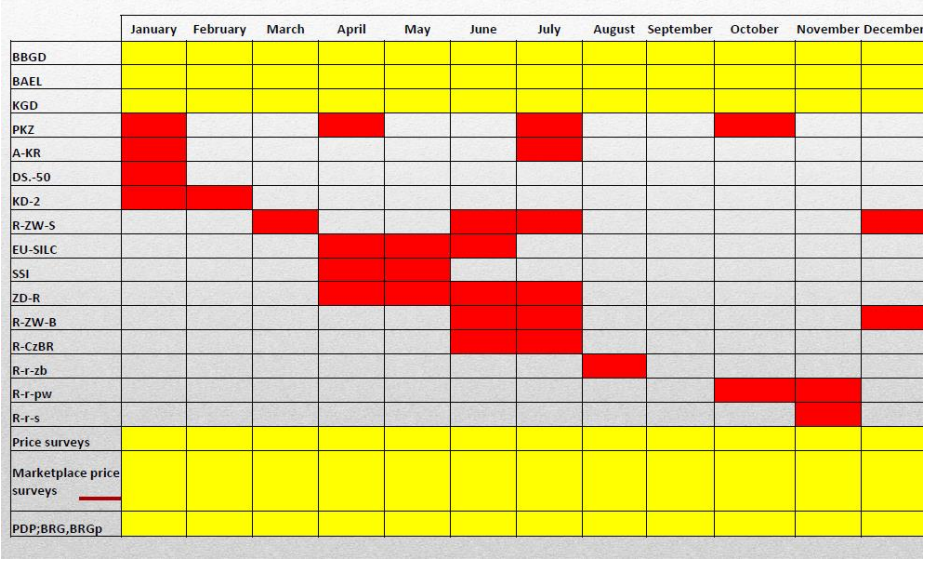

Figure 3: *Surveys planned by CSO in 2017*

Figure 4: *The number of surveys per months in 2017*

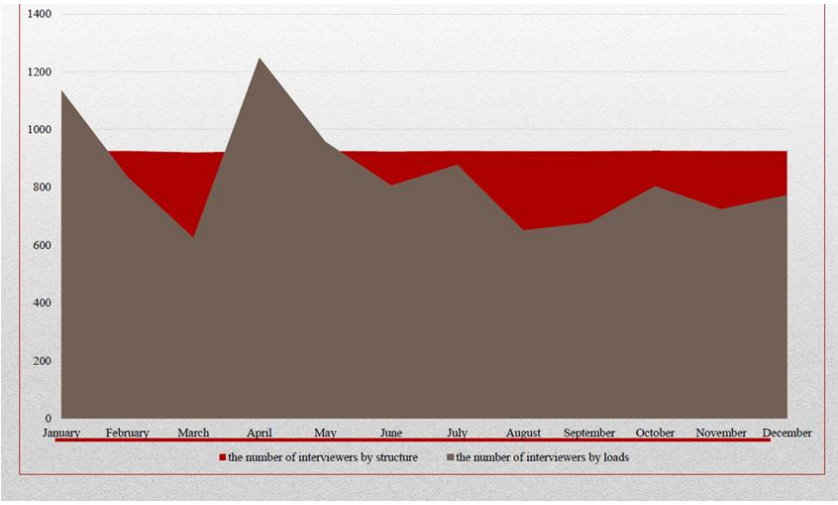

Figure 5: *The number of FTEs interviewers resulting from the monthly burden (according to estimates) compared with the number of FSEs resulting from the average standard load*

2.3 National Official Register of the Territorial Division of the Country (TERYT)

In Poland, all units for surveys are sampled from the National Official Register of the Territorial Division of the Country (TERYT) (Annex D5 – 7). The main purpose of TERYT is to provide a uniform coding method of different territorial objects in all official registers and information systems of public administration, but is also used as the base for all activities related to surveys. The basis for this registration was conducted before the census in a large field operation. According to the law on official statistic the TERYT register is available to the public (article 48 paragraph 1) and the authorities which keep official registers and information systems of public administration shall use IDs of the territorial register as an applicable standard of territorial identification (article 47 paragraph 3 law on official statistic). CSO is responsible for establishing and updating the code system used in statistics and managing the system of identifying territorial division units and system of statistical regions and census enumeration areas. The TERYT register consist of five components (Figure 6).

Figure 6: *The components of National Official Register of the Territorial Division of the Country (TERYT system).TERC - Identifiers and names of units of territorial division of the country, SIMC - Identifiers and names of localities (SIMC), BREC - Statistical regions and census enumeration areas (BREC), NOBC - Identification of addresses of streets, real estates, buildings and dwellings and ULIC - Central Catalogue of Streets (ULIC)*

In TERYT all addresses are geocoded and can be placed within national geographic administration areas. Each address is identified by hierarchical territorial identifier (TERH ID) that place each address in voivodship, counties and municipality (Figure 7) the last digit of the TERC ID reflect the unit type

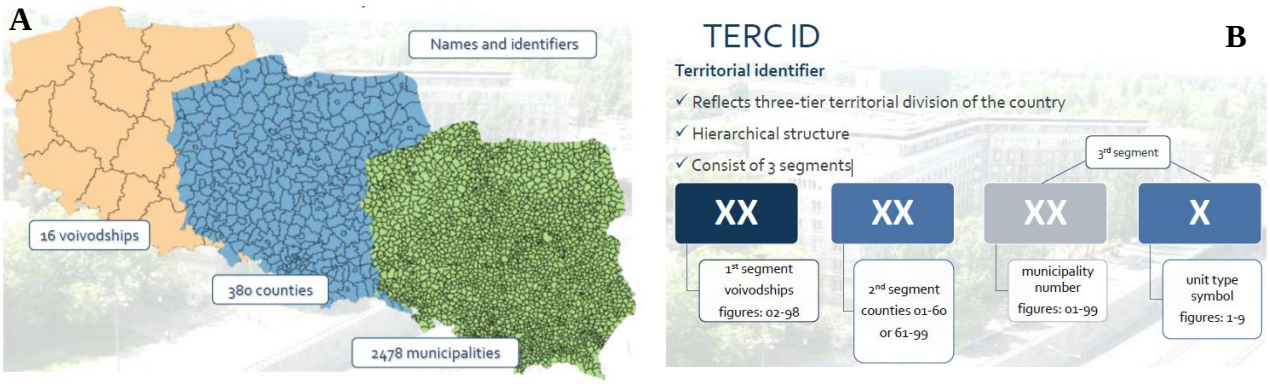

Figure 7*: **A:** Hierarchical structure of the territorial division into voivoship (16), counties (380) and 2478 municipalities (2478 identifier) **B:** TERC ID used for the three-tier territorial division of the country e.g. 10 04 062.*

The statistical regions and census enumeration areas system is maintained in the in BREC database. In the BREC database each address can be placed in a statistical region of maximum 999 dwelling and 2700 persons and each statistical area can be subdivided into a maximum of 9 census enumeration areas of maximum 200 dwelling and 500 persons. The territorial divisions are nested also with cadastral units and dwellings do not cross boundaries. Boundaries take into consideration topography and homogenous population and building types.

BREC is updated once a year in conjunction with the update of NOBC system and consists of:

- Introducing (quarterly) changes in the housing stock and the estimated
- Population of individual statistical regions and census enumeration areas
- Carrying out (at least once a year), changes in the statistical regions and census enumeration areas network, including the introduction of changes in the territorial division and division in cadastral communities

- Transferring changes mentioned above to update the numeric layer of statistical division unit's boundaries

2.4 Sampling frame for social surveys

All social surveys are carried out based on a random sample of addresses and not an individual person (Annex D5 – 8). The sampling is carried out as stratified two-stage sampling. The stratification is based on administrative territorial unit and size of locality. The distribution of units among the strata is:

- Proportional to the number of units
- Proportional to the square root of the number of units
- Increased allocation in the strata having certain characteristics, e.g. rural strata in the Household Budget Survey (HBS)

Two-stage sampling approach is used for sampling with the first stage being the primary statistical units (PSU) consisting of ~30-500 addresses but varying in territorial size the second stage being addresses (SSU).

Weighting is based on 12 characteristics of demographic data.

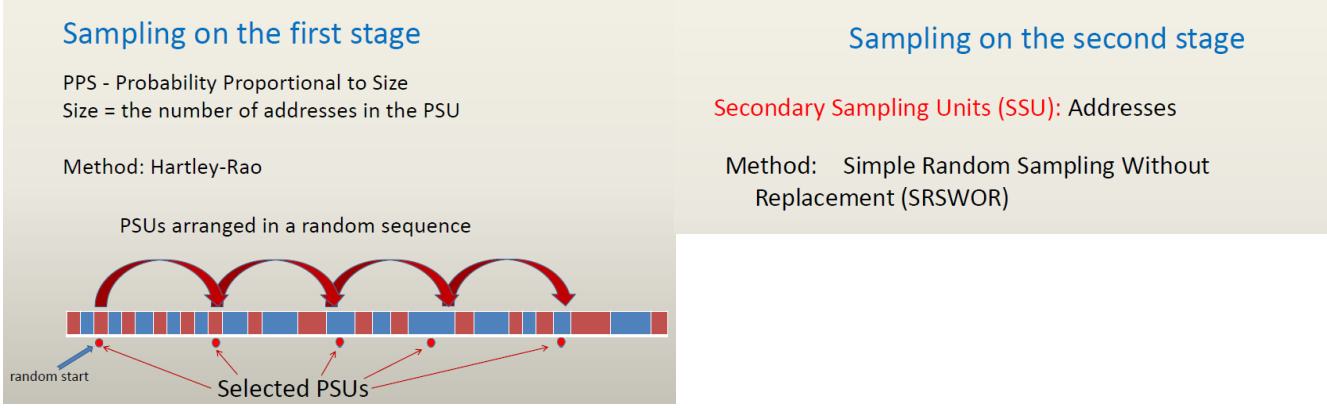

***Figure 8**: Two-stage sampling approach used for social surveys in Poland*

CSO's have seven main social surveys. They are:

1. Household Budget Survey (HBS)
2. The European Union Labour Force Survey (LFS)
3. EU Statistics on Income and Living Conditions (EU-SILC)
4. European Health Interview Survey (EHIS)
5. Information and communication technology (ICT)
6. Time Use Survey (TUS)
7. Adult Education Survey (AES)

Household Budget Survey (HBS)

Household Budget Surveys (HBSs) are national surveys focusing mainly on consumption expenditure (Annex D5 – 8). They are conducted in all EU Member States and their primary aim (especially at national level) is to calculate weights for the Consumer Price Index. In Poland ~ 37 600 households are examined each year with 1350 PSUs allocated proportionally to the number of addresses in strata and with 216 PSUs additionally allocated in rural areas in order to get a larger number of farmers' households

It was noted that the household budget survey has a high non-response problem. CSO has tried to approach this problem by using a non-randomly sorted list. The effect: planned sample size is achieved and probable increase of the bias of the estimators. For example income and alcohol consumption are lowered.

The European Union Labour Force Survey (LFS)

The Labour Force Survey (LFS) covers all persons at the age of 15 years and more, living in the sampled dwellings (Annex D5 – 10). The LFS is carried out as a continuous survey. This means that in each of the 13 weeks in a quarter interviewers visit a specified number (currently it is 4260) of randomly sampled dwellings and collect data concerning economic activity during a preceding week. The weekly samples result from a random distribution of a quarterly sample into 13 parts. The quarterly sample currently amounts to 55380 dwellings. It was constructed in such a way so that every one of 13 weekly samples is not only the same size but also has the same structure.

The sample for each quarter consists of four independently drawn elementary samples (e-samples), with a partial rotation of e-samples each quarter: This means that in a given quarter there are two e-samples surveyed in the previous quarter, one e-sample introduced into the survey for the first time and one e-sample which was not surveyed in the previous quarter and was introduced into the survey exactly a year before; As a result of this rotation system each sample is employed according to the 2-(2)-2 rule: two quarters in the survey, two quarters break, again two quarters in the survey and then out.

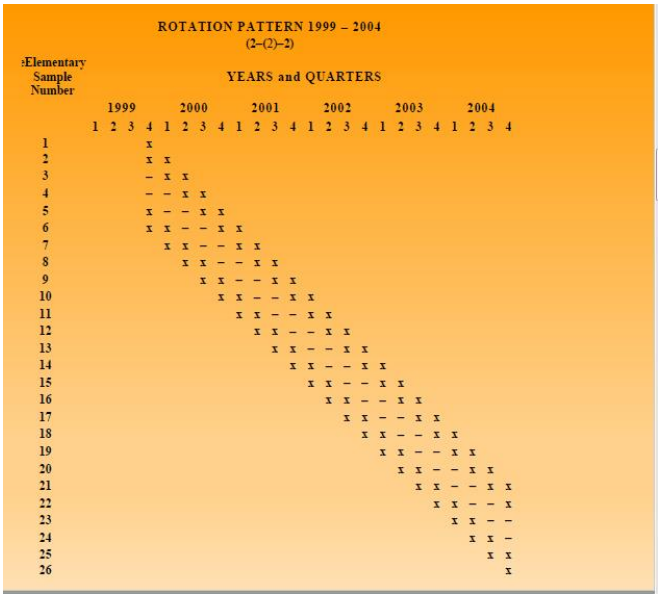

Figure 9*: The 2-(2)-2 rotation pattern of samples in the The Labour Force Survey (LFS) 1999-2004*

As for the other social surveys the sampling for the LFS follows the stratified two-stage household sampling. The Primary Sampling Units (PSUs) subject to the first stage selection are census units called census clusters in towns, while in rural areas they are enumeration districts with a probability proportional to size (Method: Hartley–Rao). The second stage sampling units are dwellings (Method: simple random sampling). Division to weekly samples is performed at the Primary Sampling Units level.

The primary sampling units (PSUs) are sampled with the appliance of so-called stratification. Division into strata is based on voivodships (i.e. 16 NUTS2 regions). Within voivodships (16 NUTS2 regions) there were additionally defined 3 to 7 strata according to the size of a place (town or village). The 1-2 largest (main) voivodship towns were distinguished as separate strata. The other strata within voivodships were created depending on the size of a place; rural areas were included into the smallest ones.

EU Statistics on Income and Living Conditions (EU-SILC)

The European Union Statistics on Income and Living Conditions (EU-SILC) is an instrument aiming at collecting timely and comparable cross-sectional and longitudinal multidimensional data on income, poverty, social exclusion and living conditions (Annex D5 – 11). This instrument is anchored in the European Statistical System (ESS). I The EU-SILC project was launched in 2003 on the basis of a "gentlemen's agreement" in six Member States (Belgium, Denmark, Greece, Ireland, Luxembourg and Austria) and Norway and implemented by Poland in 2005. The main social cohesion indicators: risk of poverty (a threshold); severely materially deprived people; people living in households in low work intricacy; people at risk of poverty or social exclusion with the main output published being:

- Socio-economic group and for the total population of households (6 groups)
- Class of locality (6 classes)
- Household size measured by number of household members (6 groups)
- Degree of urbanisation (3 classes) and region (NUTS 1, 6 classes)
- Sex and age groups

Again a stratified two-stage sampling scheme with different selection probabilities at the first stage is used. The primary sampling units (PSU) are enumeration census areas and the second stage is dwellings. Stratification of PSU: the strata (250) were the voivodships, (NUTS 2) and within the voivodships primary sampling units were classified by class of locality. In urban areas census areas were grouped by size of town. Big cities formed independent strata, but in the five largest cities districts were treated as strata. In rural areas strata were represented by rural gminas (NUTS5) of a subregion (NUTS3) or of a few neighboring powiats (NUTS4).

Proportional allocation of dwellings to particular strata was applied. The number of dwellings selected from a particular stratum was in proportion to the number of dwellings in the stratum. The number of the first stage units selected from the strata was obtained by dividing the number of dwellings in the sample by the number of dwellings determined for a given class of locality to be selected from the first-stage unit. In towns with over 100 000 inhabitants 3 dwellings per PSU were selected, in towns with 20-100 thousand inhabitants – 4 dwellings per PSU, in towns with less than 20.000 inhabitants – 5 dwellings per PSU, respectively. In rural areas 6 dwellings were selected from each PSU.

Rotation in EU-SILC

Year	Subsamples													
2005	1	2	3	4										
2006		2	3	4	5									
2007			3	4	5	6								
2008				4	5	6	7							
2009					5	6	7	8						
2010						6	7	8	1					
2011							7	8	1	2				
2012								8	1	2	3			
2013									1	2	3	4		
2014										2	3	4	5	
2015											3	4	5	6
2016												4	5	6	7

Figure 10: *The Rotation pattern for EU Statistics on Income and Living Conditions (EU-SILC) as determined by Eurostat. In 2016 the response rate for all subsamples 67.9 % which is a decrease from previous year.*

2.5 The CORstat for managing surveys and interviewers

On the second day the ICBS staff visited in Statistical Computing Centre in Radom where The CORstat for managing surveys and interviewers with special regard to GIS were presented and discussed with several staff members from the computing center including IT developer (Annex D5 - 13 and 14).

Focus was on:

- The context of the system for managing surveys and interviewers (CORstat)
- Live demonstration of the CORstat system
- GIS functions, we are working on, which will be implemented in the near future
- Development of e-questionnaires applicable to all survey modes (CAPI, CATI, CAII)

For all surveys substantive and organizational procedures are prepared by Central Statistical Office in Warsaw but coordinated by the 16 regional statistical offices using the local network statistical interviewers. At the CSO data is collected by the interviewers visiting the respondents (CAPI) or by telephone (CATI) or via Internet (CAII). In total the regional offices are in charge of 930 field interviewers performing CAPI and approx. 300 interviewers conducting telephone interviews.

Main feature of CORstat

- All surveys are run through the same central management system
- All field collection methods can be used (CAII, CAWI, CATI, CAPI, PAPI) (Kanal in figure 11A)
- Integration of all information about all the surveys including status (Figure 11A)
- Separate accesses, permissions and views are defined for manager, interviewer, etc.
- Data areas separated for survey participants from different regions (provinces) - ie. without the ability to use the system functions for data outside the region
- Flexibility in creating user roles, interchangeability of user roles in different surveys and the possibility of combining different roles in the same survey
- Adaptation for cooperation and data exchange with other systems (eg. System Call Center-CATI, CAPI)
- Basic queries are available and user friendly icons are used (Figure 11A)
- The system is easy, simple and unsophisticated compared to existing ones in the ICBS. ICBS found that its main strength is the fact that it combines all the relevant actions together for surveys
- GIS tools are implemented by the representation XY of each sample unit and interviewer (Figure 11B)

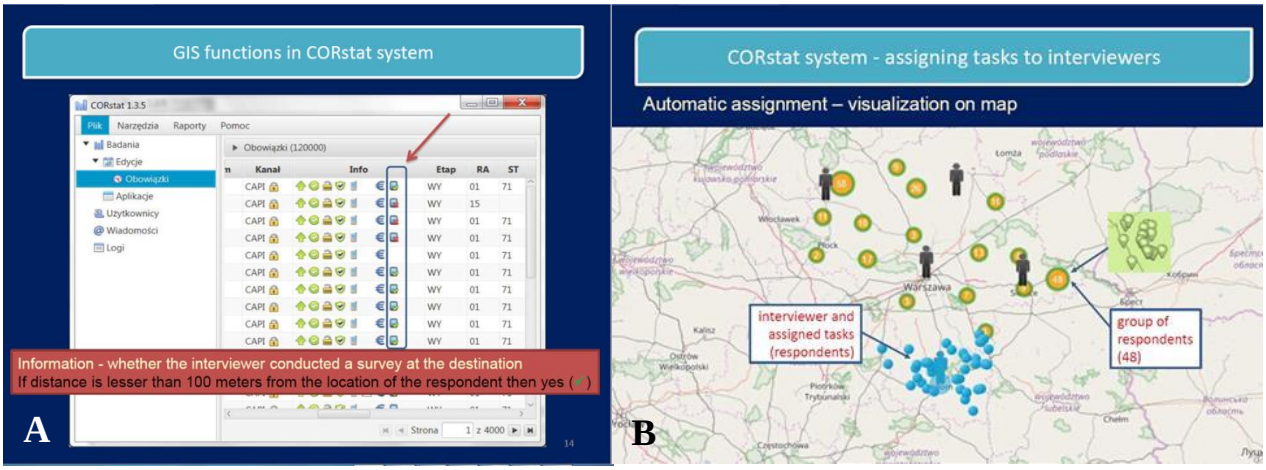

Figure 11: *Screen dumps from the CORstat system showing some of the main features.* ***A:*** *Status overview fro manager:* ***B:*** *Visualization on map*

The CORstat system was developed by Statistical Computing Centre and is still being developed and adapted to the needs of users. A forum oversees the progress and meet a regular basis.

An important feature of the CORstat system is that it does allow a mixed mode approach for data collection:

- First approach by Internet (CAII/CAWI)
- Followed by telephone (CATI) in case we have a telephone number available
- otherwise face-to-face (CAPI)
- .. and paper questionnaires (PAPI) – if there is no other option

At the first stage the respondent can respond via the internet (CAII/CAWI). After a short time CAII is shut down – the length that CAII is open depends on the survey. All questionnaires that have been filled out via CAII go to a process of quality assurance (QA) that consist both of an automatic and manual QA. In case a problem is determined, the CAII is followed up by CATI and if there is a communication problem it moves directly to CAPI. Within the CoRstat system there is no restriction between the orders of methods, all methods can be assigned manually between CATI and CAPI. The only criteria are the availability of a phone number. There are surveys that suit this method of working more, such as business surveys. Population surveys are less successful using CAII. In the 2011 population Census 13.6 % responded by CAII. The goal for the next census is 30%.

IT architecture and functionalities

In figure 12 the IT architecture of the system is drawn

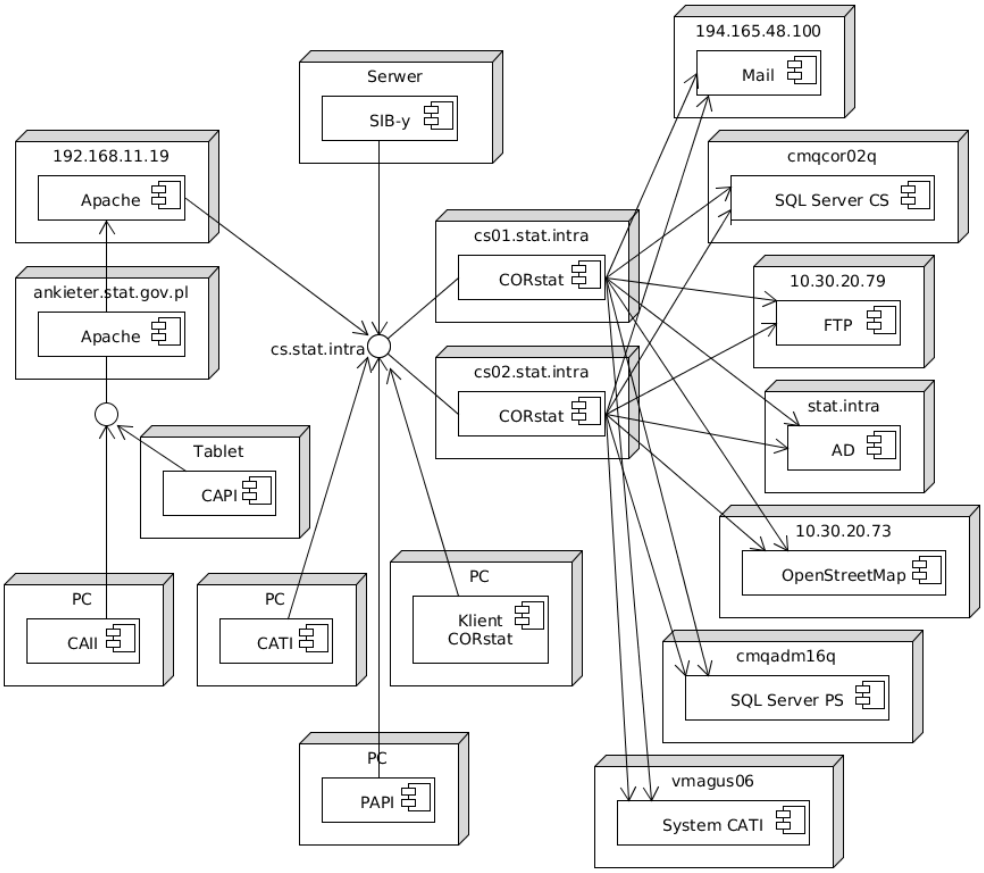

Figure 12: *The IT architecture of CORstat system*

Some of the main functionalities of the CORstat system is listed below:

Client server: The application is installed on computer. The functions are usable. The data is updated on the server, not saved on the computer. The goal is to move to tablet.

Areas of data: Services, logs, messages, users.

Logs: Description of all the actions that the users can make. 38 million activities have been saved in the past year. All logs are saved. This is used to know what the users are doing.

Messages: All the messages that have been sent. This is to ensure that no massages are sent out of the system.

Users: Interviewers and respondents accounts. Includes all the participants including supervision. All potential caii in system, they are organized in groups. Each user has an account.

Login: Data from CSO domain, employees, external users.
The system can integrate with outside systems in order to take data from enterprises for surveys.

Position: Geocoding the position of respondent. XY coordinates for the interviewers, through Open Street Map.

Authorizations specific by survey. In assigning the territorial range is required. 3 positions: whole country, regional or part of the region. The whole matrix can be presented by survey.

Services: 3 levels of structure of data: survey, edition, obligation (list of respondents per edition).
Click on services carries out list of surveys, then list of editions with parameters of survey edition, dates sent to caii, dates until when can update data. Obligations, the lowest level. List of respondents. The information of statuses are represented by icons. Each row represents one respondent before starting the survey, initial data is filled in: region, current method being used, exec.

Example of icons: The assignment has been sent to interviewer, the interviewer has uploaded the data, the questionnaire has been completed and sent back exec. The application is equipped with logical checks and questionnaire can be sent back to interviewer. Status of questionnaire: complete or incomplete form or with errors exec. There are filters for statuses.

Assigning jobs to interviewers: can be assigned manually to interviewer checking the interviewer's workload.

Allocation to interviewers between editions: Assignments or jobs can be copied from one edition to another. When the CORstat is turned on, a service that synchronizes workload is activated automatically.

Automatic assignments: The general operating principles situated in obligations, assigning on the map. Interviewer and number of respondents in area. Automatic allocation to one survey. Corrections are allowed by click, making changes daily by coordinators. The interviewer can see at all time the distance to the next respondent. When online the interviewer can connect to open street map and plan navigation to next respondent.

The system can receive and record messages from respondents. These messages can be coded. For example a refusal that needs to be referred to a coordinator and taken of workload.

Reports: by survey, workload per interviewer, progress monitoring. The platform was developed in java displayed in excel.

Maps: the information needed: where the respondent lives. This is presurvey and a record where the interviewer worked during the survey. At which distance from the dwelling of the respondent has this interview was taken place, where the questionnaire was filled in. The XY is taken in certain events: opening and closing the form. The movement of the interviewer during the interview up to a distance of 20 meters. After 20 m a new xy is taken. This system gives an idea about the situation. Up to a distance of 100 Sqr is acceptable. After the coordinator can check how the interviewer works in general. Main use is to validate refusal.

The working tool for interviewer, functionality is added XY address where the interviewer is and a navigator to a chosen parameter. This functionality is online.

Editing: Taken out addresses, adding addresses and the routes will be updated. Monitoring after the completion, what actually happened (who answered, who was at home exec). The interviewer can mark days that he does not work.

There is a screen for making an appointment but needs to be coordinated manually.

Calculation is made by distance (sending a service to open street map), assumption that interviewer has a car. Jason technology.

The environment of forms: Predetermined templates, forms that can be used on any channel, sent to respondents that self-enumerate. Within the CORStat the form can be looked at + application to build forms. The technology: dot.net, WPF. A method of showing and hiding depending on answers to previous questions.

The next step planned: a diary, list of respondents and a map. The work plan for each day + length of survey. Algorithm for planning interviewers. Planning from the address where the interviewer lives, choosing the closest respondents address, checks how much time it takes to get there, time of interview, checks the next interviewees address nearest point and so on till 8 hours.

2.6 Example – The agricultural surveys

On the third day the agricultural surveys was used to demonstrate field surveys management and allocation of tasks for the interviewers (Annex d5 – 15).

2.7 Geostatistics Portal - a platform for statistical data presentation

Geostatistics Portal is a solution for the cartographic presentation of data obtained in censuses, namely the Agricultural Census 2010 (PSR 2010) and the Population and Housing Census 2011 (NSP 2011) and also from the Local Data Bank (Annex D5 – 16). It is designed to collect, present and provide information to a wide audience, including public administration, entrepreneurs, individual users and research institutions, please consult https://geo.stat.gov.pl/en/

This comprehensive solution is tailored to European standards, and all data, by way of processing, is presented in a depersonalised form, preserving statistical confidentiality.

Geostatistics Portal is based on ArcServer customized by external company to develop application. The outcome is published and the main focus is dissemination. Please consult https://geo.stat.gov.pl/imap/?locale=en

Data is presented using various cartographic presentation methods such as (Figure 13):

- Choropleth maps
- Diagram maps

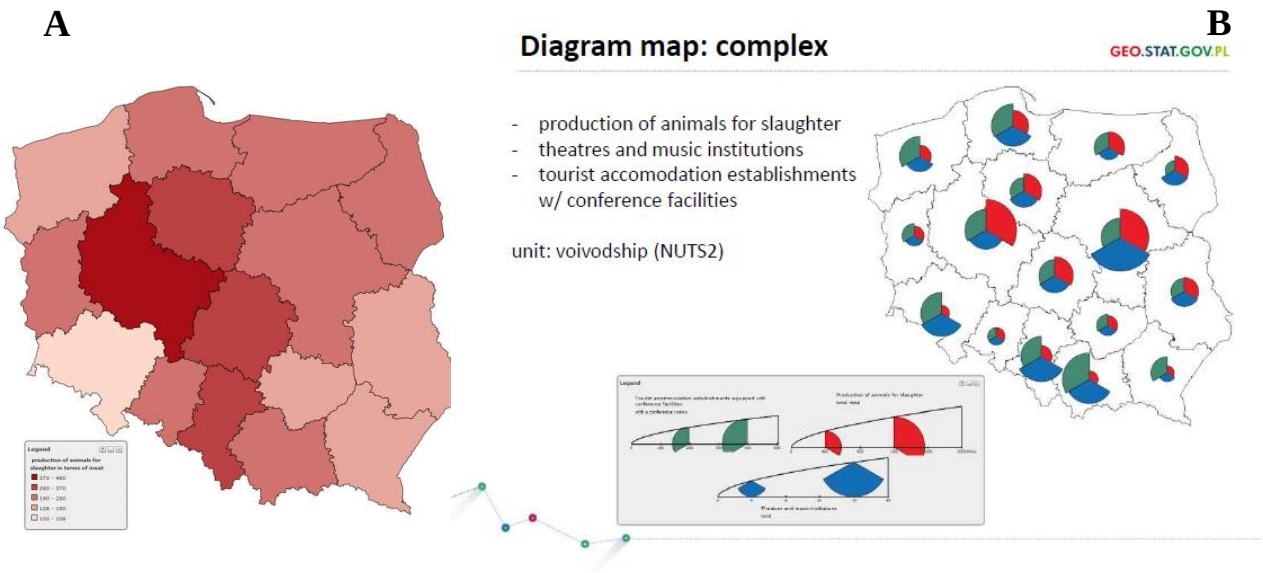

Figure 13: *Examples of* ***A:*** *Choropleth maps and* ***B:*** *Diagram maps*

Another option of the Geostatistics Portal is micro data queries based in polygon drawn on a map (Figure 14)

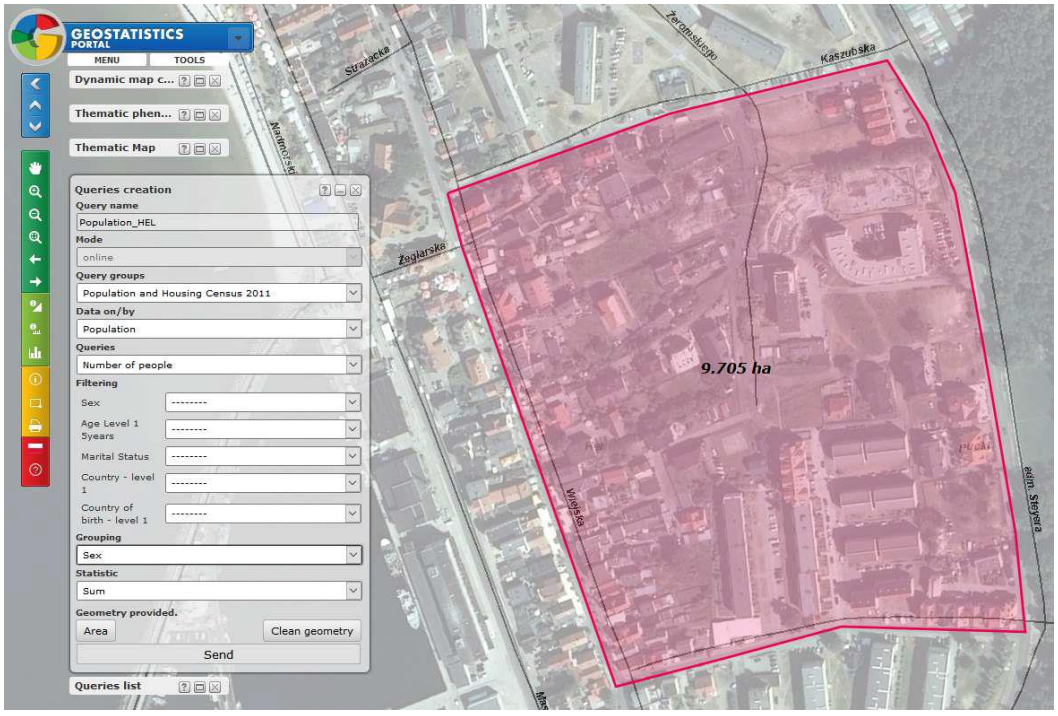

Figure 14: *Example of micro data queries based in polygon drawn on a map*

2.8 Practical implementation of the allocation of tasks for the interviewers

The last presentation on practical implementation of the allocation of tasks for the interviewers was given by Mrs. Elżbieta Lipioska, Head of the regional office in Warsaw.

As the first point it was stated that all interviewers are fully employed by regional office. The structure includes coordinators. Each inspector supervises 4 interviewers.

The main tasks of the organizational coordinators are to issue ID, manage the software (CORstat) and authorizations to preform interviews and the channels of data collection (CAII, CATI, CAPI).

In total there are around 150 employees in the Survey Department at CSO they consist of 112 interviewers, 27 inspectors, 5 organizational coordinators in 6 offices in the region. In total they are responsible for 12 surveys per year.

Over the years the main efforts have been made to disperse the interviewers as much as possible. There is a problem recruiting interviewers. They determine their hours and usually work in evening. The workload is planned and built of multi survey and the intensity of surveys varies through the year.

The salary consists of a basic salary and bonus based on complementation of questionnaires and refusal reasons. In agricultural areas interviewers can be monitored, the plan is to extend to other surveys.

The interviewer has to plan the workload and management of time. A hotline has been developed to answer to respondents questions and to confirm the identity of the interviewer. Every sample dwelling is sent a letter with the details about the interviewer and about the survey. The interviewer also delivers another letter when enumerating. The letters are printed after sampling and assignment.

Interviewers are hired from the age of 30. Life experience is important. Discretion is important. The regional office keeps a policy of open doors to the interviewer and offers support. An interviewer meets his/her inspector once a week.

Training is also done by video conferences. Every survey involves training. The training process for a new interviewer: there are basic requirements plus demonstrations on questionnaires from the easiest. Around 2 weeks of training. Surveys are introduced gradually. New interviewers are always accompanied by experienced interviewer or coordinator at the beginning in the field as part of their training. In most cases training is given by coordinators from headquarters. There is also a detailed guide for each individual survey and each question has information provided with it embedded in the questionnaire.

Quality control of field work: The GPS methodology is a credible picture of the actual work in the field. You can respond at any given moment to irregular field activity and save inspector work time. The GPS was presented to the interviewers in order not to take them by surprise. Since introducing GPS performance has risen. Interviewers get information on how they perform. The transitional period was not easy.
One of the ways used to ensure data collection quality is by escorting the interviewer with a inspector that is not he/ she direct inspector.

Sometimes inspector's double checks the interviewers work, preferably by the phone number. The excuse used, is to make sure that the present was delivered to respondent.

The most common complaints of interviewers: is the lack of cooperation from respondents, the length of questionnaires and the overlapping of questions between surveys.

A coordinator is in charge of 2 to 3 surveys. An interviewer will work on more. Every survey conducted is concluded by a report summering up the field side of the survey and delivering recommendations to

headquarters for the next year. Every 2 to 3 years the inspector/interviewer relations are switched in order to ensure common practice.

3. Recommendations summarized by ICBS

- Moving gradually to using a regional interviewer who specializes in a certain geographical area and works on multi surveys for improving field data collection.
- Using existing geographical infrastructure in ICBS for consistency, stability and for all field stages and needs.
- A multi survey system that gives the ability to see the whole picture of all the surveys together. A functional work tool for all the different job functions in the survey department from interviewer to manager.
- Combining field collection methods in one management system: CAII, CATII, CAPI and gradually implementing them in a stepwise approach.
- Combining all field needs into one management system for all stages: Pre and during data collection. Integrating GIS tools as a component.
- Managing and monitoring in one system plus visualization. The ability to simply identify potential allocation problems and drill down by need.
- The multi system management that features GIS tools will provide the needs for all organization hierarchy. From ICBS management to supervisor, defined by relevant needs.
- Online field collection: Emergency button for securing interviewers safety; an online GPS of all interviewers for monitoring field process, identifying problems when needed and solving them in real time exec.
- Combining multi survey interviewers and changing the work hours from part time to full time as a potential solution to the lack of interviewers in ICBS and decreasing employment turnover.
- Swapping interviewer - coordinator relation every 2 to 3 years.
- Focusing on user-friendly icons and intuitive user platforms.
- Conducting a separate meeting regarding sharing information on upcoming censuses 2020 in both Israel and Poland.
- Seeking more information and experience from other member state that have experience with managing multi field surveys.
- Establishing a long term plan and introducing technical and methodological processes gradually.