COOPERATION ON MULTI-MODE DATA COLLECTION (MMDC)

MIXED-MODE DESIGNS FOR SOCIAL SURVEYS - MIMOD

GRANT AGREEMENT FOR AN ACTION WITH MULTIPLE BENEFICIARIES

AGREEMENT NUMBER – 07112.2017.010-2017.786

Final Report

Final methodological report summarizing the results of WP 1-5

Date: 26 March, 2019

Author: Marina Signore (Istat)

Summary

Executive Summary

This document summarises the results made in Work Packages (WPs) 1 to 5 of the MIMOD – *Mixed-mode designs in social surveys* project.

The project started on 1st December 2017 and ends in May 2019. The kick-off meeting took place on 1-2 February 2018, in Vienna and was organised by Statistics Austria. The Final Workshop of the MIMOD project will take place on 11-12 April 2019, in Rome and is organised by Istat.

As stated in the call, the project aimed at supporting EU National Statistical Institutes (NSIs), with regard to "multi-mode and multi-device data collection challenges" for a set of topics (i.e. mode organisation; mode bias/mode effect and its adjustment; case management in MMDC[1]; mixed-mode designs; challenges for phone and tablets respondents in CAWI), which are at the forefront of applied research and represent the most notable challenges NSIs are currently facing.

The MIMOD project team has worked in an effective and efficient way on the six Work Packages (WPs), keeping in mind the synergies and links among the different WPs and taking advantages of the Consortium as a whole. The project set up a network of national experts and practitioners on the topic of data collection, which proved to be useful in facilitating joint work and exchange of information, as well as in supporting the project activities.

Istat (Italy) led the Consortium in partnership with CBS (Netherlands), SSB (Norway), STAT (Austria) and Destatis (Germany). The network of supporting countries consisted of INSEE (France), Czech Statistical Office (Czech Republic), Central Statistical Office of Poland (Poland), Statistic Finland (Finland) and Statistics Sweden (Sweden).

The MIMOD project comprised five WPs, plus WP6 for overall project management and the organisation of events. The first five WPs dealt with: **WP1:** Investigation of mode organisation (concurrent vs consecutive multi-mode data collection); **WP2:** Mode bias/mode effects and adjustment for mode-effects; **WP3:** Case management in MMDC and related data logistics; **WP4:** Mixed-mode designs (unimode vs. mode-specific questionnaires); and **WP5:** Challenges for phone and tablet respondents within CAWI.

The report is organised as follows:

A. **Results obtained in WP1-5**.

This section summarises the aims, the deliverables and the main findings of each WP.

B. **A look ahead**

The results achieved by the project, enabled us to suggest future activities in mixed-mode data collection designs, which might be beneficial to the European Statistical System (ESS).

C. **Dissemination activities**

The MIMOD project and some specific results have been presented in various Conferences and workshops.

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[1] Multi-mode data collection

A. Results from WP1-5

Work Package 1: Investigation of mode organisation (concurrent vs consecutive multi-mode data collection)

Aims and deliverables

The general purpose of WP1 was to research on the topic of mode organisation, considering concurrent vs consecutive designs as well as the most recently developed adaptive or responsive designs. It provided guidance for the mode choice and mode allocation in order to minimise measurement bias, costs and increase response rates.

A major activity within WP1 was to design and implement a survey to collect information on mixed-mode designs in use in statistical offices. The survey was initially planned to be run among the Consortium and Supporting Network NSIs. However, at the MIMOD kick off meeting, it was decided to enlarge the survey to EU NSIs.

The aims of WP 1 were:

1. To provide updated information on the use of data collection modes at NSIs for ESS social surveys;
2. To determine the steps of a decision process to support mixed-mode design and optimal mode allocation, also termed adaptive design.

WP1 deliverables are:

- Deliverable 1: **Report on survey results.** (Report on MIMOD survey on the state of the art of mixed-mode for EU social surveys)

- Deliverable 2: **Methodological report.** (Methodological report - *Mixed-mode strategies for social surveys: how to best combine data collection modes*)

Deliverable 1: Report on MIMOD survey on the state of the art of mixed-mode for EU social surveys

Authors: Manuela Murgia (Istat), Martina Lo Conte (Istat), Dag F. Gravem (Statistics Norway)

The deliverable reports on the main results of the "Survey on the state of the art on mixed-mode for social surveys" run among the European NSIs from March 26 th to May 5th 2018. The aim of survey was to collect information to be used as input to all MIMOD WPs.

Istat coordinated the design and the implementation of the MIMOD survey. The web questionnaire was developed using an open source software, *LimeSurvey*. Despite the long questionnaire and the request for detailed information, all 31 EU NSIs answered to the survey allowing for an updated and complete picture on the mixed-mode practices in use in the ESS.

Eurostat supported the project in achieving this goal by informing the Directors of Social Statistics about the survey objectives and by designating a contact person to coordinate the work within the office, (different sectors were indeed involved in the task of providing information).

The questionnaire comprised 5 sections, one per WP. The survey was not limited to closed questions; there was room for providing explanations, comments and uploading documentation (e.g. advance letters or screenshots of questions). The questionnaire is available for consultation as an annex to the deliverable.

The MIMOD survey investigated the following ESS social surveys:

- Labour Force Survey waves 1 and 2
- Survey on Income and Living Conditions waves 1 and 2
- European Health Interview Survey
- Adult Education Survey
- Survey on Information and Communication Technology
- Household Budget Survey
- Harmonised European Time Use Survey .

The NSIs could report also on additional social surveys (up to three) carried out at national level.

The deliverable provides an overview on the main survey results for the 5 sections. The analyses of qualitative information (open-ended questions) is reported in deliverable 2 of WP1 as well as in other WPs as part of their deliverables.

The deliverable reports in detail the results on the following topics: i)which data collection modes are used for the main social surveys and how modes are combined, ii) the five-year trend in the use of mixed-mode and of the web mode in social surveys, iii) how concurrent and sequential mixed-mode designs are managed, iv) which communication strategies with respondents are used, v) the use of incentives to respondents, vi) the management of break-offs and vii) the use of adaptive/responsive survey designs.

The MIMOD survey provides evidence that mixed-mode strategies are to be considered as the 'standard' approach for EU social surveys. Their use has increased in the last five years as well as the use of the CAWI. CAWI increased mainly as a component of mixed-mode designs. More than half of social surveys adopt mixed-mode data collection, although the use of a single technique is still high. The main advantage of using a mixed-mode strategy seems to be the cost reduction while the main limitation to further use is the organizational complexity, as reported by NSIs.

Deliverable 2: Methodological report - *Mixed-mode strategies for social surveys: how to best combine data collection modes*

Authors: Manuela Murgia (Istat), Martina Lo Conte (Istat), Lucia Coppola (Istat), Doriana Frattarola (Istat), Alessandro Fratoni (Istat), Annemieke Luiten (CBS), Barry Schouten (CBS)

The deliverable focuses on mode administration – concurrent vs sequential - which represents a main feature of mixed-mode designs. It provides the reader with elements useful for deciding on which data collection strategy to adopt. Three cases studies on Istat and CBS surveys offer concrete examples on how to implement the decision process. The deliverable concludes with a summary of results and some proposal for future developments.

The deliverable reports on the experiences on mixed-mode designs in the ESS, including adaptive/responsive designs. The general conclusion from the MIMOD survey is that mixed-mode designs have become the rule rather than the exception; adaptive mixed-mode survey designs are exception rather than rule.

The deliverable provides checklists for the choice of mode strategy and for mode allocation. Mode strategy refers to the selection of modes and how to mix them, (i.e. concurrent, sequential or a hybrid form); mode allocation refers to adaptive mixed-mode survey designs in which mode strategies may differ for subpopulations.

The deliverable delineates a checklist for the decision process on mode strategy. As known, the survey mode is the design feature that has the strongest impact on survey errors and survey costs. In addition, modes often have their own logistics and infrastructure and combining modes in one design is challenging for survey case management, monitoring and analysis. Consequently, a discussion of mode choice and mode allocation is a discussion of virtually all aspects of survey design and analysis. However, the deliverable defines and comments the steps to follow for the choice of mode strategy.

It also provides guidance for designing adaptive mixed-mode surveys. Adapting the allocation of modes to different subgroups is a next step to mixing modes since it offers more flexibility in making trade-offs between survey errors and survey costs. The deliverable provides a checklist that serves as a guide to adaptive mixed-mode survey designs.

The two checklists share many steps. Crucial steps include identification of quality and cost objectives, risks assessment, monitoring and evaluation. The checklists cannot be detailed for each ESS social survey in such a way to be meaningful for each NSI. This would have required a follow-up survey that was beyond the scope of current MIMOD project. However, the checklists are illustrated for three case studies, one at ISTAT and two at CBS.

Final remarks

Mode choice and mode allocation are at the core of survey design and analysis. Since survey modes have an impact on both representation errors and measurement errors, mode choice and mode allocation are a complex endeavour that demands for explicit objectives and risks assessment. Although, survey designers acknowledge the important role of mode-specific measurement, mode choice and allocation rarely involve explicit criteria for data quality in practise. Comparability and equivalence in respondent answers are usually restricted to the questionnaire design stage. However, in recommendations for mode choice and allocation, mode-specific measurement biases must be accounted for, even after careful questionnaire design. Given this incomplete picture of objectives and risks, WP1 restrained from general recommendations and limited itself to structuring mode choice and mode allocation.

The MIMOD survey gave valuable insight into current practices at ESS NSIs and may form the starting point for an additional inventory. In order to go a step further, we recommend to 'translate' the two checklists in this deliverable into short follow-up questionnaires that evaluate each of the checklist steps in the ESS. These questionnaires would then identify main objectives and risks as viewed by NSIs, and, most importantly, would make it clear how well actual implementations meet the objectives and avoid risks. Potentially, the checklists may also identify population subgroups for which adaptation is promising. Such a follow-up survey could be done for a sample of surveys and NSIs in a smaller project.

Work Package 2: Mode bias/mode effects and adjustment for mode-effects

Aims and deliverables

The purpose of WP2 was to investigate how to identify and assess the mode effects. Mode effects (both selection and measurement effects) need to be properly assessed and adjusted in order to ensure accurate estimates. WP2 addresses mode effects, their assessment, and estimation strategies that adjust for unwanted mode effects.

WP2 objectives were:

1. to provide an updated overview on methodologies for mode effect assessment and adjustment in mixed-mode designs, particularly those currently used in the ESS, with a discussion of assumptions, advantages and disadvantages of the various approaches;
2. to evaluate the suitability of selected statistical approaches and methods to deal with selection errors and to adjust for the measurement errors in mixed-mode data collection surveys based on practical applications and statistical analyses;
3. based on the results of the performed analyses and published literature, to provide general guidelines about methodological approaches that can be adopted to deal with mode-effects in mixed-mode designs.

WP2 deliverables are:

- Deliverable 1: **Report containing an overview on current methodologies adopted at the ESS NSIs to deal with mode bias/mode effects in multi-mode designs.** (Current methodologies to deal with mode effects and mode bias in mixed-mode designs)

- Deliverable 2: **Report containing the results of the analyses performed on re-interview designs.** (Report containing the results of the analyses performed on re-interview designs -*A cost-benefit analysis of re-interview designs for mode-specific measurement bias*)

- Deliverable 3: **Report containing the results of the applications of selected methods on mixed-mode social surveys.** (Report containing the results of the applications of selected methods on mixed-mode social surveys - *Experimenting methods to assess and adjust mode effect when a single mode control survey is available as a benchmark: a case study on the Italian "Aspects of daily life" survey*)

- Deliverable 4: **Methodological report**

Deliverable 1: Current methodologies to deal with mode effects and mode bias in mixed-mode designs

Authors: Bart Buelens (CBS), Jan A. van den Brakel (CBS), Barry Schouten (CBS)

The deliverable contains an overview of approaches to mode effect assessment and adjustment found in recent literature. A section reporting on results from the MIMOD survey held among statistical Institutes in ESS countries on their experiences and research activity on mode effects is included as well.

Well-designed multi-mode surveys may reduce costs and non-sampling errors (coverage, nonresponse, and measurement errors). However, possible mode selection effects (resulting from errors of nonobservation), and mode measurement effects (resulting from observation errors) can affect the survey results due to the

use of different data collection modes. Mode effects need to be properly assessed and adjusted in order to ensure accurate estimates.

The deliverable reviews recent literature and highlights solutions to common problems in the area of mixed-mode data collection. The report is not intended to be an exhaustive inventory of literature. Rather, it aims at reporting on significant contributions, and at providing an overview of the field by providing examples from the literature.

Mode assessment studies are more insightful when they separate the total mode effect into selection and measurement components. Experimental designs specifically aimed at disentangling the two effects, are preferable, but costly, and hence less common. Such designs include parallel, independent surveys, embedded experiments, and re-interview studies.

Adjustment methods are not as commonly encountered in the literature as assessment methods. Adjustment techniques are aimed at correcting survey estimates for bias induced by one or several modes, or by the specific combination of several modes. Adjustment for bias requires the presence of a definition – or choice – of reference mode or design that serves as a benchmark, since bias of some design is only meaningful with respect to some other design. Adjustment techniques that have appeared in the literature include reweighting and calibration approaches, imputation, and prediction approaches.

The MIMOD survey held among statistical agencies in ESS countries confirms the picture arising from the literature review, that mode effect assessments are more widespread than mode effect adjustments. While about two thirds of countries report to have undertaken activities related to mode effect assessments, only one third says to have taken measures to adjust for mode effects. Somewhat remarkably, just less than half of the countries report to have plans for future mode effect assessment or adjustment studies.

The deliverable concludes with some general remarks on how better use the methods presented. A promising line of future research is the development of mixed-mode designs that allow for separating selection from measurement effects, for example through embedded experiments (see deliverable 2 of WP2).

Deliverable 2: Report containing the results of the analyses performed on re-interview designs - *A cost-benefit analysis of re-interview designs for mode-specific measurement bias*

Authors: Barry Schouten (CBS), Thomas Klausch (CBS/VUmc), Bart Buelens (CBS), Jan van den Brakel (CBS)

The deliverable addresses the cost-benefit analysis of re-interviews. Re-interview designs are a potential tool to estimate and adjust for mode-specific measurement bias. The deliverable presents the results of a cost-benefit analysis for two surveys, the Dutch Health survey and the Dutch Labour Force survey, and discusses the utility and validity of re-interviews. The conclusions of the study are that for the Labour Force survey a re-interview may not be useful due to relatively small measurement differences, while for the Health survey it may be useful.

The paper considers mixed-mode re-interview designs, in which a sample of respondents to the regular survey is invited to participate in one of the other modes that is employed. More specifically, it considers sequential mixed-mode designs, where some of the modes are offered only to nonrespondents in the other modes.

However, re-interview designs may be very costly, especially when face-to-face is included as a survey mode. The crucial question is whether benefits outweigh costs, i.e. whether the potential increase in accuracy of survey statistics is worth the investment. The answer to this question depends heavily on the purpose of the re-interview, i.e. assessment versus adjustment, the size of the mode-specific measurement biases, and the relative costs of the modes. Re-interview designs also make a number of assumptions that will not hold for

every setting. The deliverable presents the methodology to optimize re-interview designs and to estimate mode-specific measurement biases. The two case studies in the paper show that a re-interview can be profitable under both the design perspective and the adjustment perspective.

The deliverables comments on possible directions to further explore and elaborate the methodology and findings presented. A final remark is that it would be very useful if findings of the deliverable could be replicated for other surveys and in other countries and settings.

Deliverable 3: Report containing the results of the applications of selected methods on mixed-mode social surveys - *Experimenting methods to asses and adjust mode effect when a single mode control survey is available as a benchmark: a case study on the Italian "Aspects of daily life" survey*

Authors: Claudia De Vitiis (Istat), Francesca Inglese (Istat), Alessio Guandalini (Istat), Marco D. Terribili (Istat), Roberta Varriale (Istat)

The deliverable presents a set of analyses for assessing and adjusting mode effects in a specific survey context. The methods are framed in the review of methodologies to cope with mode effects (see deliverable 1 of WP2). Mode effects are analysed for the Istat "Multipurpose Survey on Households - Aspects of daily life", (Multiporpose survey hereafter), for which an experimental design was considered. The deliverable provides comments on the results of the applied methods, and discusses the advantages and limitations of the proposed approaches.

In 2017, the mixed-mode was introduced for the first time in the Multipurpose survey; the web technique was added to the traditional PAPI technique in a sequential design. A parallel single mode PAPI design was planned to allow for an assessment of mode effect on two independent samples collected with different techniques. This experimental design allows the researchers to disentangle selection and measurement effects by using mode insensitive auxiliary information.

The deliverable presents the analyses carried out to assess and adjust for mode effects. The results highlight that the mixed mode design catches better the overall population, being more "representative" than the single mode design. When the assessment of mode effect is carried out for specific variables, the results generally provide an explanation for breaks in the series due to both selection and measurement effect. The detection of measurement effects provides a useful advice for the planning of future survey editions, i.e. the increased coverage due to mixed-mode design.

The set of analyses presented in the deliverable, can be viewed as a sequence of steps usable by researchers of other NSIs to carry out an assessment of mode effects in similar application contexts. They cover the different approaches applicable in this specific survey context, though without claiming to be exhaustive.

This experience was very useful to Istat because it was the occasion for experimenting several methods for assessing and adjusting mode effects in an experimental context, usually not very frequent. A similar research path can be followed to evaluate the impact of the switching from single to mixed-mode. Indeed, the underlying effort is hardly compatible with the usual resources and the timing of a statistical process. For repeated surveys an accurate planning of the data collection phase is advisable, in order to prevent the measurement effect, which is the main drawback of the mixed-mode.

Deliverable 4: Methodological report

Authors: Orietta Luzi (Istat), Claudia De Vitiis (Istat), Francesca Inglese (Istat), Roberta Varriale (Istat), Alessio Guandalini (Istat), Marco Dionisio Terribili (Istat), Barry Schouten (CBS)

The deliverable provides general guidance and advice on methods to detect and adjust for mode effects in mixed-mode surveys, derived from the analyses carried out during the project.

It starts with a summary of the results achieved within WP2, as described in detail in the previous three deliverables: 1) the update of the literature review on methodologies for mode effect assessment and adjustment, including the main results from the query conducted in the MIMOD project; and 2) the applications of selected methods and approaches on current mixed-mode social surveys, which have been carried out by Istat and CBS on specific case-studies.

The deliverable provides general guidelines based on a methodological schematization of the approaches and methods that can be adopted to assess mode effects and/or to adjust for mode effects in mixed-mode surveys. In this schematization, the methods, the type of analyses and the context for different research objectives are summarized. Next, the key elements that characterise a methodological strategy to deal with mode effect estimation and adjustment are defined and discussed. They are: i) the design (experimental design or observational studies); ii) auxiliary data (from administrative data/frame data/paradata) or covariates; and iii) a set of assumptions.

The core section of the deliverable discusses the main advantages and possible risks associated with the use of methods for the analysis of total mode effect, as well as for disentangling measurement and selection effects, which is needed in order to adjust for the bias deriving from the combined use of different modes. Pros and cons of adopting either experimental or observational studies are also highlighted.

This discussion is a useful guide for NSIs wishing to conduct research on mode effects in mixed-mode social surveys.

Final remarks

Based on evidences and outcomes of the activities in WP2, a general discussion and high-level guidelines and advices about possible methodological approaches and solutions to deal with mode-effects in mixed-mode designs have been provided.

However, given that only two countries have been involved in WP2, the results of the performed analyses allowed us to delineate quite general guidelines on possible risks and advantages of combining modes of data collection in this context. For the same reason, the WP2 results could not cover all the specific situations and application contexts of each country in the ESS.

Nevertheless, the results of WP2 provide all ESS countries with an updated overview about methodological solutions to improve the quality of estimates produced in mixed-mode social surveys. The general guidance and discussions reported in the final report represent a good starting point for countries who plan to design own methodological strategies to assess and possibly adjust for mode effects in surveys using mixed-mode data collection.

Further research and analyses are necessary in this area both at National and European level.

At European level, it is recommended that suitable modes of collaboration could be identified in the future to proceed with developments in this area, e.g. through a network of countries interested in continuing the discussion on methodological issues.

In particular, even if standardization is difficult in this context due to the complexity of the methodological elements involved in the design of strategies to deal with mode bias/mode effects, the general guidelines and advises provided in the final report can be considered a first step to proceed towards the development of generalized tools supporting ESS countries in the methodological design of their own strategies.

Work Package 3: Case management in MMDC and related data logistics

Aims and deliverables

WP3 aimed at analysing the characteristics of efficient data collection systems for mixed-mode data collection and providing best practice solutions adopted in the ESS. The first aim was to bring forward a thorough definition of what a data collection system is and find a practically useful typology of the different kinds of systems. The definition will include the listing of the important technical components and organisational processes needed for data collection in a mixed-mode design. The second aim was to give an overview of data collection systems used or being prepared in the EU NSIs for mixed-mode data collection. Furthermore, challenges to efficiency and quality when running a data collection system will be brought to light and best practice solutions will be portrayed as by means of in-depth expert interviews on selected EU NSIs.

WP3 deliverables are:

- Deliverable 1: **Desktop review exercise and draft typology.**

- Deliverable 2: **Exploratory interviews and questionnaire.** (Exploratory interviews and questionnaire - *Exploratory standardized questions in MIMOD survey*)

- Deliverable 3: **Standardized survey on CMS.** (Standardized survey on CMS - *In-depth telephone interviews on data collection systems in practice*)

- Deliverable 4**: In-depth expert interviews**. (In-depth expert interviews on data collection systems in practice - *Technical solutions to the challenges of running mixed-mode surveys)*

- Deliverable 5: **Methodological report.** (Methodological report - *Final Report on Data Collection Systems within the ESS*)

Deliverable 1: Desktop review exercise and draft typology

Author: Marc Plate (Statistics Austria)

The deliverable aims to build a first knowledge base about the components and types of data collection systems that are currently in practice within the ESS. This knowledge base is intended to serve in preparation of the in-depth telephone interviews to selected NSIs, which are reported in deliverables 3 and 4 of WP3. Nevertheless, by means of desktop review and the analysis of the MIMOD survey data, the picture about the landscape of data collection systems within the ESS became much clearer. The deliverable concludes with some final remarks.

The deliverable describes all possible components of a full data collection system that were found during the desktop review. These components can be grouped in domains and subdomains. As such structuring of components could be very helpful in understanding the complexity of Data collection systems, the components are presented by domain and subdomain. The deliverable argues that a high quality data collection system consists of four domains: i) survey instrument, ii) staff management, iii) case management, and iv) quality assurance. The deliverable describes each domain and its components. For each component, the most important features for an effective system are listed.

The deliverable drafts a typology of data collection systems. This is done on the basis of the MIMOD survey data. It seems that the data collection systems within the ESS cannot be typed along one single aspect. Rather

the systems differ in four main dimensions: i) the degree to which their components are integrated in one single system; ii) the completeness of components in use; iii) the degree of external software usage; and iv) the degree of survey integration. A typology for each of these four dimensions is introduced and the Data collection systems of each country are classified accordingly.

The preliminary findings show that data collection systems within the ESS are very heterogeneous and differentiate along all the four above-described dimensions. Some recommendations are given to develop an efficient data collection system. In terms of data collection efficiency, systems with a high degree of component and survey integration would be aspired. That is one single data collection system for all socials surveys (or maybe also the business surveys?) that has integrated its components in a way that information can be transferred automatically and live. In terms of high data quality, the completeness of the Data collection system's components is of uttermost importance. By covering all subdomains and using strong component's features, the data collection procedures can be easily adapted to the needs of the cases and the surveys. In terms of input harmonisation between countries and in terms of resource spending in the ESS overall, the degree of in-house developed products that cannot be shared with other systems should be kept to a minimum.

Deliverable 2: Exploratory interviews and questionnaire - *Exploratory standardized questions in MIMOD survey*

Author: Marc Plate (Statistics Austria)

The deliverable gives technical information about the MIMOD survey questions on data collection systems in use in the ESS. The results of the survey are presented in deliverable 1 "Desktop review exercise and draft typology".

Originally, this report was planned to deliver the results of the exploratory interviews that were planned to conduct as a preparation for deliverable 3 "Standardized survey on CMS". However, at the MIMOD kick-off meeting in February 2018, the partner countries concluded that for deliverable 3 the planned standardized online survey may lead to incomplete data, not much detailed information about the data collection systems and puts a high response burden on the NSIs. Therefore, a change of methods was agreed upon: Instead of a standardized survey in deliverable 3, a qualitative open telephone interview should be conducted. That decision made also a change of method for deliverable 2 necessary: Instead of explorative interviews, standardized questions about the Case Management should be integrated in the MIMOD survey. That way WP3 will get some basis information on data collection systems for all countries via the MIMOD survey and deeply detailed information about the countries with certain types of data collection systems via the telephone interviews of deliverable 3 and deliverable 4.

Deliverable 3: Standardized survey on CMS - *In-depth telephone interviews on data collection systems in practice*

Author: Marc Plate (Statistics Austria)

The deliverable presents some first results of the in-depth telephone interviews on current data collection systems used in the ESS. It focuses on the relationship of the NSI's organizational form and the architecture of the data collection system.

Based on the MIMOD survey data 14 NSIs where selected for the in-depth telephone interviews on data collection systems. They were selected to represent each data collection system type as described in deliverable 1 of WP3. Additional information is reported in deliverable 4 of WP3. Even without being

complete, the results help to give a general idea on how an ideal data collection system could be designed in order to accommodate for the heterogeneity of organizational forms within the ESS.

The deliverable shows how the organization influences the design of the data collection system and vice versa. The architecture of current data collection systems is deeply rooted in the way data collection is organised within one specific NSI. The interviews show that most of the heterogeneity found in the data collection systems can be explained by some key aspects of the organisation. Firstly, the systems differ due to which modes the NSI has offered in the past and which mode is their dominant mode. Secondly, the systems may differ depending on the degree of separation within the NSI between the social surveys and business surveys. Thirdly, the survey organization as omnibus surveys seems to effect the design of the system. Most importantly, the practical organisation of fieldwork, such as the degree of centralisation, the roles of interviewers and the way respondent contact is handled, explains the differences in the architecture of data collection systems.

That IT strategies regarding the use of external tools also effect the system's architecture is obvious. Therefore, the report gives insights on the discussion about in-house versus external tools. All in all, a strong case for considering organizational change management before implementing a new system is made.

Deliverable 4: In-depth expert interviews on data collection systems in practice - *Technical solutions to the challenges of running mixed-mode surveys*

Author: Marc Plate (Statistics Austria)

The deliverable presents the most needed technical features of an efficient data collection system able to tackle the challenges posed by mixed-mode survey designs. The areas investigated are: questionnaire production, case management and communication with cases. The deliverable shows that within each area, although there are sometimes very different approaches in some countries, there seems to be common needs in most of the main issues about data collection and an overall trend towards similar technical solutions.

The findings are based on interview data of experts of 14 different EU NSIs. Special focus is given to the way countries have implemented theses technical features in their newly developed data collection systems.

For "Questionnaire Production", some countries have started to integrate a questionnaire production component within their data collection systems. This component brings together the steps *questionnaire design*, *programming* and *testing*. It seems that there is still a need to agree on a questionnaire metadata standard.

For "Case Management", all of the interviewed countries developing new systems centralise the case administration within their systems. For efficient case management the implementation of a general pre-defined survey plan, that automatically executes the main fieldwork activities, seems a promising approach. But careful measures must be taken to still allow for individual case treatments, as this is needed for adaptive and responsive design. Furthermore, a standardisation of disposition codes[2] and temporary contact codes within the ESS, could be a promising task. Not only would this strengthen the comparability of response rates, it would also save resources in the NSIs having to come up with standards across their surveys and modes themselves.

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[2] Disposition codes record the outcome of data collection such as "Interview Complete", "No contact", "Refusal" and so on.

For "Communication with cases", there is a trend in countries with new data collection systems in centralising both inbound and outbound communication. However, not many countries have integrated the tools used within the contact centres into their data collection systems.

Deliverable 5: Methodological report - *Final Report on Data Collection Systems within the ESS*

Author: Marc Plate (Statistics Austria)

The deliverable shows the landscape of data collection systems in use in the ESS by profiling the main components needed for running complex mixed-mode designs. Some highlights within the systems in use are presented by interviewed country. Also, best practices in implementing the needs that arise from complex mixed-mode surveys are marked there. Furthermore, the deliverable provides recommendations on the main components of a modern data collection system. It concludes by showing possible ways for collaborating in this process of change.

The landscape of data collection systems in the ESS is singled out as follows: i) Countries, that have finished a new system; ii) Countries, that are in the midst or end of developing a new system, iii) Countries, that have just started or will soon start developing a new system; iv) Countries, that plan to start developing a new system in the next two years; and v) Countries, that do not plan to develop a new system.

The experience of some countries that have designed new systems shows that by following key design's principles makes it possible to develop systems that enable joint work, maybe even joint development.

Final remarks

The work carried on in WP3 shows how the data collection systems in use in the ESS, highly depend on the tradition, organisation and IT infrastructure of each country. Nevertheless, mixed-mode survey design challenges NSIs to develop efficient data collection systems – both organisationally and technically - to implement such designs. Most countries underwent or are currently developing new and more integrated systems. One key lesson learned is that efficiency is best gained when also the organisation of data collection undergoes a change alongside.

For the above reasons, a recommendation from WP3 is to try to join efforts and try to collaborate in designing and maybe also in development some components of the systems. It would be indeed difficult to have a data collection system that can be used by all countries as a whole, given the different organizations and IT structures. Nevertheless, WP3 recommends to start collaborating on a single component or metadata set. Countries then might be able to integrate just the components they need into their systems.

Work Package 4: Mixed-mode designs (unimode vs. mode-specific questionnaires)

Aims and deliverables

The purpose of WP4 was to give best practice recommendations on approaches for developing web questionnaires for mixed-mode surveys. Recommendations were made at both survey/questionnaire level and questions level.

WP4 also investigated best practices on modes used in the contact and follow-up phases of data collection, as the total data collection design strategy should be taken into consideration before offering recommendations on web data collection.

Moreover, tests were conducted within WP4 on questionnaire and questions design with a focus on web self-administered surveys (CAWI).

The objective of the WP were therefore threefold:

- Give recommendations on the operationalisation of key and typical questions, and questionnaire design elements in different modes, focusing on the need of adaptation for CAWI;
- Give recommendations on survey communication in mixed-mode surveys, including invitation strategies, reclaiming of breakoff and nonresponse follow-up;
- Give recommendations on the fitness of key ESS surveys for mixed-mode settings, also including scenarios with reduced questionnaire length, imputation of values, and sample size.

WP4 deliverables are:

- Deliverable 1: **A paper on mixed-mode combinations and experiences.** (Mixed-mode experiences of European NSIs)

- Deliverable 2: **A paper on best practice survey communication in mixed-mode surveys.** (Survey communication in mixed-mode surveys)

- Deliverable 3: **A paper outlining recommendations for key questionnaire elements, questions and question types in mixed mode settings.** (Recommendations for key questionnaire elements, questions and question types in mixed mode settings. *Related to the European Statistical System's person and household surveys)*

- Deliverable 4: **Methodological report**

Deliverable 1: Mixed-mode experiences of European NSIs

Authors: Dag F. Gravem (SSB), Christoffer Holseter (SSB), Elisabeth Falnes-Dalheim (SSB), Stefania Macchia (Istat) , Sabrina Barcherini (Istat), Annemieke Luiten (CBS), Vivian Meertens (CBS)

Deliverable 1 presents some key results from the MIMOD survey on mixed-mode experiences and practices among EU NSIs. It investigates how different mixed-mode combinations in use are reflected in questionnaire and question designs. Case studies from MIMOD partners Statistics Norway, Istat and Statistics Netherlands illuminate further aspects of the survey results.

The survey results showed a great heterogeneity in mode use and data collection procedures. It was assumed to be the product of different historic and current preconditions of EU NSIs. In the MIMOD questionnaire, the countries that used CAWI as part of their mixed-mode design were asked how different the versions of their questionnaires are. A total of 16 of 23 NSIs with mixed-mode involving CAWI reported having differences on at least one of the investigated dimensions. 12 of the 16 NSIs reported having differences on more than one dimension.

Some conclusions reported in the deliverable are:

- Firstly, modes will be mixed, and they will be mixed for a variety of reasons. Sometimes, modes that are discouraged either by Eurostat or by literature for specific types of questions will be used.

- Secondly, national questionnaire differences between modes appear to be moderate. This could be due to unimode strategies, but may also be related to lack of resources, or by constraints from Eurostat specifications and recommendations. Some of the countries that have done major changes recommend strong questionnaire adaption, a respondent-centric web design approach and modularizing of questionnaires.

The paper concludes with the tentative recommendation of an *omnimode* approach - the one adopted by Statistics Netherlands - of rebuilding questionnaires for mixed-mode from scratch. However, this would ideally imply that Eurostat's model questionnaires and technical specifications and guidelines be re-developed to avoid conflicts of recommendations. A tentative recommendation from MIMOD WP4 would then be to redesign the model questionnaires and technical guidelines themselves to make proper recommendations for mixed-mode data collections.

Deliverable 2: Survey communication in mixed-mode surveys

Authors: Dag F. Gravem (SSB), Elisabeth Falnes-Dalheim (SSB), Sara Demofonti (Istat), Marina Signore (Istat)

Survey communication comprises all contacts with respondents, including the contact phase, response phase, and follow-up phase. Different communication tools and modes are generally used for pre-notifications, invitations and reminders. Thus the mixed-mode concept can be extended to the survey communication strategy.

Deliverable 2 looks at European NSIs experiences in survey communication based on the MIMOD survey, as well as two national case studies (from Statistics Norway and Istat) and recent literature on the topic. An appendix submitted by Statistics Netherlands for WP4 deliverable 4 constitutes a third national case study.

As shown by the MIMOD survey, the "web first" strategy is currently dominant among European NSIs using mixed-mode data collection. There is great variation in terms of available contact modes and contact information, and the constantly changing (albeit at different paces) technological, social, economic, legal and other conditions make it difficult to offer very concrete recommendations regarding survey communication strategies. Clearly, access to quality register information on addresses, mobile phone numbers and e-mail addresses is of great benefit for the contact and follow-up phases.

A general consideration, gained from the results of MIMOD's WP3 deliverable 1, is that NSIs should integrate information on each contact attempt in each contact mode in the case administration systems to be better able to evaluate and make evidence-based decisions during the data collection process.

The paper concludes with five tentative recommendations on the project findings and discussions:

1. Consider using all available contact and response modes.

2. Use proper and coherent design principles in information materials and questionnaires

3. Be prepared to experiment and continuously develop contact strategies for initial contact and follow-up phases

4. Design questions and questionnaires for mixed-mode data collection; do not constrain them to one mode or type of communication. For mixed-mode involving web, consider shortening questionnaires and avoid formats that are not mobile or web friendly.

5. Integrate communication with respondents for all contact modes in case administration systems.

Deliverable 3: Recommendations for key questionnaire elements, questions and question types in mixed-mode settings. *Related to the European Statistical System's person and household surveys*

Authors: Dag F. Gravem (SSB), Nina Berg (SSB)

The deliverable reviews questionnaires and central questions, and assess their fitness for the mixed-mode reality in the ESS for the following surveys: The Household Information and Communication Technology survey (ICT), the European Health Interview Survey (EHIS), the European Standards of Income and Living survey (EU-SILC) and the Labour Force Survey (LFS).

For each survey, the deliverable takes Eurostat's model questionnaires and other documentation as a starting point, before reviewing some national adaptations of questions. Based on these reviews, using the Campanelli classification (Appendix A), certain questions have been selected for user testing.

The results from cognitive and usability testing of survey questions carried out for the MIMOD project are presented. Further documentation on these tests is found in Appendix B (*Test report from Statistics Norway's cognitive and usability testing of questions and questionnaires*).

To determine to what degrees ESS surveys are fit for mobile CAWI is one of the tasks of WP5. However, all CAWI surveys are mobile web surveys, as experience shows that some respondents will always try to complete questionnaires using mobile phones. Therefore, this deliverable also assesses which question types are suitable for mixed-mode with a mobile first approach, and which are suitable for mixed-mode with an optimized mobile web questionnaire.

Recommendations and suggestions for further testing and developments are offered. These recommendations are aimed at Eurostat as much as at the National Statistical Institutions.

Given the observed differences between countries, there can be national differences in each survey's suitability for mixed-mode. In addition to assessing the ESS surveys' fitness for mixed-mode data collection, the fitness of some national implementations are also discussed.

As discussed in this and previous WP4 deliverables, the modes that Eurostat recommends for the different ESS surveys is often in conflict with the content of the survey, but also with the way they are actually conducted in the various ESS countries. Some of the recommendations will therefore conflict with Eurostat's pre-existing recommendations and regulation contents. Moreover, an individual survey can also contain some questions that will work better in one mode, and others that will work better in another mode.

The main recommendations should therefore perhaps be directed at Eurostat rather than the individual countries: changes should be made to model questionnaires, guidelines and other documentation to better facilitate mixed-mode questionnaire development and data collection. This could include shortening questionnaires by modularizing them, by limiting the number of items in grids questions, removing all non-essential questions, and considering how each question will work in different modes using the Campanelli or

other sets of criteria. In a sentence "*All ESS survey model questionnaires should be designed with mixed-mode in mind*".

The results from Statistics Norway's user tests of unimode and mode-specific approaches point in the direction of a unimode approach being safer than a mode-specific approach for the questions that were tested.

Deliverable 4: Methodological report

Author: Dag F. Gravem (SSB)

The Methodological Report from WP4 presents a summary of the main findings of previous deliverables. It describes the methodology used in the previous deliverables (1-3) and discusses some of the main results. It also comments on findings and recommendations in WP5 that concern some common topics. Indeed, WP4 looks at questionnaire design and how to adapt it for web data collection, while WP5 explores the use of mobile phones in social surveys thus looking at commonalities like screen navigation and question clarification.

It should be noted that deliverables 1-3 of WP4 have a methodological content and provide recommendations on the topics they deal with.

Final remarks

A general methodological recommendation from WP4 is about that Eurostat materials (e.g. model questionnaires and recommendations for individual social surveys) need to be revised and updated to reflect the increasing usage of CAWI in the ESS.

Deliverable 3 also suggests the setup of a wiki-type forum for the continuation of research and the exchange of experiences and results. Further research could and should be done on all the topics covered by WP4, including the Campanelli typology. Although highly useful for the project, the fact that it does not directly distinguish between paper and web self-completion (PASI and CAWI) limits its potential. The sheer nature of the rapid development of Internet communication technology necessitates continuous updating.

Methodology and protocols for mixed-mode pretesting is yet another topic that would benefit from further exchange of opinions and practical experiences.

Work Package 5: Challenges for phone and tablet respondents within CAWI

Aims and deliverables

WP5 investigated the employment of mobile devices in ESS social surveys. In particular, it explored fitness of ESS surveys for smartphones. It explored as well the utility of mobile device sensors (such as GPS, camera, microphone, accelerometers) to supplement or replace survey data.

Enabling surveys on mobile devices is important as more and more respondents attempt online surveys on a variety of devices. This trend is expected to continue in the coming years. To enrich survey data by mobile device sensor data is a more advanced objective and requires new skills, programming of cross-platform applications and a separate data collection backend infrastructure.

The objective of this WP was threefold:

1. Determine which of the ESS social surveys are fit for mobile devices with relatively little modifications to content and length;

2. If an ESS survey is not fit, decide what (potentially infeasible) changes to the survey content and questionnaires would be needed;

3. Explore the potential use of mobile device sensors in ESS survey.

WP5 deliverables are:

- Deliverable 1: **A report discussing the fitness of mobile devices for the ESS surveys.** (Assessment of fitness of ESS surveys for smartphones)

- Deliverable 2: **Draft responsive questionnaire design for two selected ESS surveys and Census that are fit with relatively little anticipated modifications.** (Responsive questionnaire designs for the LFS and ICT)

- Deliverable 3: **A final methodological report discussing the use of mobile device sensors in ESS surveys.** (Final methodological report discussing the use of mobile device sensors in ESS surveys - *Sensor data for ESS surveys: a first inventory)*

- Deliverable 4: **A final methodological report presenting results of usability tests on selected ESS surveys and Census. (**Final methodological report presenting results of usability tests on selected ESS surveys and Census - *Smartphone fitness of ESS surveys – case studies on the ICT survey and the LFS*

Deliverable 1: Assessment of fitness of ESS surveys for smartphones

Authors: Barry Schouten (CBS), Karen Blanke (DESTATIS), Dag Gravem (SSB), Annemieke Luiten (CBS), Vivian Meertens (CBS), Oliver Paulus (DESTATIS)

The deliverable proposes a set of fitness criteria for the use of smartphones in social surveys that are applied to four ESS surveys (EHIS, ICT, LFS, and SILC). Two of the surveys, the ICT survey and the Labour Force Survey on the person level are suggested as potentially fit for smartphones with relatively modest revisions. The deliverable also reports on the MIMOD survey results about the possibility of completing ESS surveys on a smartphone and types of adaptions of questionnaire and questions design for smartphone (if any). The deliverable concludes with recommendations for these four surveys.

The set of criteria are related to three dimensions: smartphone *screen size*, smartphone *navigation* and *interview duration*. The three dimensions are considered crucial in the assessment of fitness of questionnaires for smartphones. Within these dimensions, a number of scales are suggested, that allow for a gradual assessment of fitness. However, adapting a questionnaire to smartphone may require a much more extensive redesign for surveys that do not yet have a self-administered online implementation. Deliverable 3 of WP4 of the MIMOD explicitly discusses strategies for questionnaire development for both interviewer-administered modes and self-administered modes.

The assessment criteria were applied to Eurostat model questionnaires and country-specific implementations of the EHIS, EU-SILC, ICT and LFS. Deliverable 1 presents and discusses how the four ESS surveys scored on each dimension.

Based on the assessment, the deliverable provides some recommendations for the use of smartphones. Two out of four surveys have scores that indicate a redesign for smartphones may be feasible, but with modifications. The ICT survey is relatively short and has a moderate to good online response rate. It will require a considerable redesign of the wording of questions and answers and solutions to handle the introductions and instructions. The LFS on a person level may also be doable: online response rates are lower, but are likely to increase for a person level. Navigation needs to be looked at as it has many filter questions and a number of open questions. Like the ICT, wording of questions and answer categories require a thorough redesign. The EHIS and, especially the EU-SILC, do not seem suitable for smartphones without major changes to the length. EU-SILC is problematic on all fronts and seems the hardest to transform to smartphone application.

Deliverable 2: Responsive questionnaire designs for the LFS and ICT

Authors: Dag F. Gravem (SSB), Vivian Meertens (CBS), Barry Schouten (CBS)

The deliverable consists of smartphone responsive questionnaire designs for two selected ESS surveys. Applying the fitness criteria, ICT survey and LFS at the individual level were selected (see deliverable 1 of WP5). In deliverable 3 of WP5, the smartphone questionnaires are implemented and tested by CBS and SSB.

Adapting a survey questionnaire for smartphones is more than implementing screen size responsiveness. It implies question rewording, revising the use of introductions, breaking up grids of questions, and potentially also shortening the survey as a whole.

The deliverables describes in detail the choices operated for the LFS and ICT surveys.

Deliverable 3: Final methodological report discussing the use of mobile device sensors in ESS surveys - *Sensor data for ESS surveys: a first inventory*

Authors: Ole Mussmann (CBS), Barry Schouten (CBS)

The deliverable considers the second objective of WP5, the use of mobile device sensors. It provides an inventory of potential sensor measurements which could be used to enrich ESS social surveys. The deliverable concludes with some remarks and recommendations for future work.

The deliverable proposes a set of criteria to support cost-benefit assessments of sensor measurements and sensor data and makes a first inventory of sensor options for the ESS social surveys. The criteria are constructed from three viewpoints. The first viewpoint is from the perspective of the survey itself; the question is *does the survey contain topics or questions that may benefit from automated measurements*. The

second viewpoint is that of the sensor; *what are accuracy and costs of the sensor options*. The final viewpoint is the respondent; *how does the respondent react to a request for sensor data*.

For each ESS survey, pairs of topics and sensor measurements are identified. All pairs are evaluated against the three types of criteria. The pairs of survey topics and sensor measurements, identified in the deliverable, are by no means exhaustive. Others may come to alternative options. Also in time, new options may emerge. A follow-up to this deliverable should give a more in-depth account of existing literature and case studies.

The most promising combinations of sensor data and survey data are those that score well on all three sets of criteria. For all ESS surveys, except AES, we found pairs of survey topics and sensor measurements that potentially have a positive business case. These examples deserve further exploration and elaboration. However, there may often be one or more obstacles in exploiting the sensor measurements or sensor data. These obstacles are related to respondent willingness, data access, data handling or unknown quality.

Two final recommendations are:

- To replicate the assessments of the various criteria with experts in mobile device and wearable sensors, especially for quality.

- To empirically test respondent willingness to provide sensor data and to consent to linkage to existing secondary data. Such experiments have emerged, but are yet at early stages.

Deliverable 4: Final methodological report presenting results of usability tests on selected ESS surveys and Census - *Smartphone fitness of ESS surveys – case studies on the ICT survey and the LFS*

Authors: Dag F. Gravem (SSB), Vivian Meertens (CBS), Annemieke Luiten (CBS), Deirdre Giesen (CBS), Nina Berg (SSB), Jeldrik Bakker (CBS), Barry Schouten (CBS)

The deliverable focuses on the qualitative tests to assess the fitness of the questionnaires, partially optimized for smartphones, which were developed for ICT and LFS surveys (see deliverable 2 of WP5). The tests were conducted at CBS (the Netherlands) and SSB (Norway). The tests considered both comprehension and usability.

The paper extensively describes and discusses the methodology and findings of the tests conducted in the two countries.

Detailed recommendations on questionnaire design for mobile devices are provided. The paper presents a set of recommendations per each fitness dimension - *Screen size, Touch navigation Duration-* and, in addition, general recommendations. In line with these recommendations, the deliverable lists possible design actions to improve mobile device fitness.

The deliverable concludes with two general topics for future discussion within the ESS: mobile device first questionnaire design and questionnaire length of ESS surveys (see final remarks below).

Final remarks

WP5 proposes three general topics for future discussion within the ESS: mobile device first questionnaire design, questionnaire length of ESS surveys, and a more detailed replication of the survey-sensor data inventory. These topics were beyond the scope of the current WP. The first two naturally arise from an assessment of fitness for mobile devices, in particular smartphones. The third follows from the growing interest in big sensor data.

WP5 recommends a mobile device first questionnaire design, or, at the least, of a rigorous account of the mobile device option in questionnaire design. There are two main reasons for this. The first reason is that smartphones have become a dominant communication channel and cannot be ignored in design. The second reason is that issues with usability and comprehension on smartphones reveal the measurement error prone questions and question blocks. Such a viewpoint, however, has implications for ESS model questionnaires and ESS survey guidelines. Multi-device surveys introduce additional challenges for the questionnaire design.

An obstacle that is often put forward to introduction of new devices is questionnaire length. However, the results in WP5 raise the need of trying to shorten (or redesigning) ESS model questionnaires making it user friendly to fill in on a smartphone.

The WP5 inventory of relevant survey-sensor data combinations was a first start. However, this first inventory already revealed promising and realistic combinations. Here the link to the ESSnets Big Data and Big Data 2 is also very obvious. A future replication may take a combined viewpoint.

WP5 recommends that these topics be addressed in both general discussion on ESS procedures and in specific working groups for ESS surveys.

B. A look ahead

The project outcomes were summarised in Section A. They show how variegate the situation in the ESS is, with regard to mixed-mode designs. The existing differences are due to several factors ranging from cultural to organisational and technological aspects. Moreover, such a heterogeneous state was observed in all WPs for the different topics that were dealt with.

The MIMOD survey provided an updated and exhaustive picture of the state of the art in mixed-mode designs in Europe. The quantitative and qualitative answers, provided by all 31 EU NSIs, represent a very valuable source of information, which, in some specific cases, was followed-up by telephone interviews (e.g. for data collection systems and adaptive/responsive designs).

One of the project's aims was to provide recommendations and support to EU NSIs in implementing mixed-mode designs in social surveys, with a focus on the web component. Therefore, most deliverables comprehend a set of recommendations or steps to follow when designing and implementing mixed-mode surveys in the ESS.

Although recommendations and guidance were provided by all WPs, they are not to be considered as a definitive answer to the challenges that NSIs are currently facing. The society and the technology are continuously evolving. Particularly, on the use of the web as well as mobile device sensors in ESS surveys, constant and quick changes are to be expected.

For these reasons, final remarks from MIMOD project went a step further by suggesting future activities that could be beneficial to the ESS.

A first important action is to disseminate, as widely as possible, the results achieved by MIMOD. Dissemination activities should address EU NSIs at large, the academia as well as internal dissemination within the partner NSIs. Standard presentations on MIMOD outcomes could be prepared and made available (e.g. on CROS portal, Istat website), together with the deliverables. Such a set of presentations could facilitate the dissemination task. Furthermore, MIMOD results could find room in next European training programmes.

The Final Workshop is a very relevant step in spreading knowledge about MIMOD. It will allow us to share the results with the representatives from EU NSIs and get their feedbacks. Nevertheless, the discussion should remain lively to fully exploit the results achieved so far. That may require some kind of support from Eurostat.

Each WP highlighted peculiar needs and areas requiring further work, as summarised below.

Mode choice and mode allocation:

A major output consisted of two checklists aimed to guide the design of mixed-mode strategies, particularly on mode choice and mode allocation taking into account quality, costs and risks.

Next, it would be of interest to explore how each step of the checklists is viewed and assessed in EU NSIs. This result could be achieved by a short follow-up questionnaire. A further activity will consist of tailoring the checklists for mode choice and mode allocation to more specific cases.

Mode effects assessment and adjustment

High-level guidelines and advices about possible methodological approaches and solutions to deal with mode-effects in mixed-mode designs were provided.

Further research and analyses in this area are needed both at National and European level. Collaboration among interested countries at EU level is envisaged to achieve methodological developments.

The general guidelines can be considered as a first step towards the development of generalized tools for the methodological design of countries' own strategies. The guidelines comprise of a number of design choices and specifications. It would be very valuable to make an inventory of how the ESS NSI's make these choices and whether there is a common ground to harmonize some of the choices.

Data collection systems

Recommendations on the components of Data collection systems were singled out together with the architecture and software design principles that would allow for sharing of tools in the ESS.

Considerations of ESS input harmonisation and resource savings should discourage the development of in-house developed products that cannot be shared with other systems.

A further step would consists of trying to join efforts and collaborate in designing and, maybe also, in developing some components of the systems. Such a collaborating could start on a single component or a single aspect of management systems.

Web questionnaire design and testing

A strong recommendation is to adopt an *omnimode* approach, which consists of rebuilding questionnaires for mixed-mode from scratch instead of adapting existing questionnaires to the web mode. This would imply as well, a redesign of Eurostat model questionnaires and technical guidelines for ESS social surveys to make proper recommendations for mixed-mode data collections and thus reflecting the increasing usage of CAWI in the ESS.

The setup of a wiki-type forum would facilitate the continuation of research and the exchange of experiences and results. Further research could and should be done on all the topics covered by WP4, including the Campanelli typology. Although highly useful for the project, the fact that it does not directly distinguish between paper and web self-completion (PASI and CAWI) limits its potential. The sheer nature of the rapid development of Internet communication technology necessitates continuous updating.

Methodology and protocols for mixed-mode pretesting is yet another topic that would benefit from further exchange of opinions and practical experiences.

Use of smartphone and mobile device sensors

Areas for future research and discussion on this topic are: mobile device first questionnaire design, questionnaire length of ESS surveys, and a more detailed replication of the survey-sensor data inventory.

Smartphones have become a dominant communication channel and cannot be ignored in design. In addition issues with usability and comprehension on smartphones reveal the measurement error prone questions and question blocks. Therefore, a developing research activity concerns a smartphone first approach in questionnaire design, or, at the least, a rigorous account of the mobile device option in questionnaire design.

From the assessment of fitness of ESS social surveys for smartphones, the need to split or shorten ESS model questionnaires became evident. This area of future activity includes what has already been said about the need of adapting model questionnaires and guidelines to take into account for mixed-mode designs and CAWI mode.

The inventory of relevant survey-sensor data combinations was a first start. However, this first inventory already revealed promising and realistic combinations that should be elaborated and evaluated. Here the link to the ESSnets Big Data and Big Data 2 is very obvious. A future replication may take a combined viewpoint in which data collection takes hybrid forms, mixing primary and secondary data collection.

These topics need to be addressed in both general discussion on ESS procedures and in specific working groups for ESS surveys.

C. Dissemination Activities

Information on the MIMOD project is available both in Italian and in English on ISTAT website (https://www.istat.it/en/research-activity/international-research-activity/essnet-and-grants) under the topic international research activity.

The project's aims and first results were shared with the scientific community in several events to raise awareness on MIMOD and receive useful feedbacks on ongoing activities.

A **special session "Improving the quality of multi-mode data collection. The European MIMOD project"** was organised by ISTAT at the **European Conference on Quality in Official Statistics -Q2018**, 27- 29 June 2018, Krakow. The Session, chaired by Marina Signore, was organised as follows:

The MIMOD Project: an overview – Marina Signore (ISTAT) and Manuela Murgia (ISTAT)

Dealing with mode effects –Orietta Luzi (ISTAT) and Bart Buelens (CBS)

Adapting ESS survey questionnaires to mixed-mode data collection – Dag Gravem (SSB)

ESS surveys and mobile device data collection – Barry Schouten (CBS), Karen Blanke (DESTATIS), Dag Gravem (SSB) and Vivian Meertens (CBS)

On Eurostat invitation, the project coordinator presented the MIMOD project and outcomes at the Conference of European Statistics Stakeholders 2018-CESS 2018, in Bamberg, Germany on 18–19 October 2018.

The MIMOD project: a platform for sharing knowledge and practices in the ESS - Marina Signore (ISTAT)

Other presentations were:

Assessment of fitness of ESS surveys for smartphones – Barry Schouten (CBS), Karen Blanke (DESTATIS), Dag Gravem (SSB), Annemieke Luiten (CBS), Vivian Meertens (CBS), Oliver Paulus (DESTATIS)- **International Workshop on Household Survey Nonresponse**, Sept 2 -4, Budapest, Hungary

Mode-Mixers of the North Unite? Trends in Nordic and European data collection for social surveys - Dag F. Gravem, Statistics Norway, **Nordic Statistical Meeting**, Helsinki, 26-28 August 2019

Karen Blanke; Oliver Paulus (DESTATIS), *MIMOD*, **Quest Evaluation Standard (QUEST) Workshop,** Wiesbaden, 29-31 October 2018.

The need for mixed-mode designs – some results from workpackage 4 of the MIMOD project Nina Berg (Statistics Norway), **Quest Evaluation Standard (QUEST) Workshop**, Wiesbaden, 29-31 October 2018.

Acknowledgements