

COOPERATION ON MULTI-MODE DATA COLLECTION (MMDC)

MIXED MODE DESIGNS FOR SOCIAL SURVEYS - MIMOD

GRANT AGREEMENT FOR AN ACTION WITH MULTIPLE BENEFICIARIES

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WP5 – Deliverable 1

Assessment of fitness of ESS surveys for smartphones

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WP5: Challenges for phone and tablet respondents within CAWI

SUMMARY: WP5 of the MIMOD project investigates the employment of mobile devices in ESS surveys. In particular, it explores fitness of ESS surveys for smartphones and it explores the utility of mobile device sensors to replace and/or supplement survey data. In this first deliverable, we focus completely on the fitness for smartphones. We present a set of criteria related to smartphone screen size, smartphone navigation and interview duration, we apply the criteria to Eurostat model questionnaires and country-specific implementations of the EHIS, EU-SILC, ICT and LFS, and we end with recommendations for these four surveys. Deliverable 1 is a stepping stone to deliverable 2 in which we select two ESS surveys and test smartphone responsive questionnaire designs. We propose to test the LFS, but restricted to a single person in the household, and the ICT.

Introduction

Modes affect answering behaviour and may lead to method-specific measurement bias, item-nonresponse bias and break-off. In general, modes are disparate on four features:

1. Presence of an interviewer: Interviewers may motivate respondents and keep them concentrated, may assist in explaining terminology but may also cause social desirability bias;
2. Speed and pace of the interview: Surveys over the phone tend to go faster than in person which in turn tend to go faster than online and on paper;
3. Presentation of the survey items: The distinction between oral and visual presentation and the type of visual presentation may affect answers;
4. Timing of the interview: The flexibility to choose a time and location to fill in the questionnaire may affect answers;

We assess fitness of surveys for smartphones relative to traditional online devices, i.e. desktops and laptops. We assume that the online mode already is an optional mode in the survey and the questionnaire is fit for these traditional devices. For this reason, when considering the effect of devices we consider mostly the disparity due to presentation and due to timing of the interview. Obviously, the presence of an interviewer does not play a role when comparing devices. Apart from the difference in loading time of web pages on different devices, also the speed and pace are similar between devices. However, as mobile devices offer more flexibility in the location at which the questionnaire is completed, devices may affect the timing of the interview. The difference in presentation between devices is again obvious, mobile devices have smaller screen sizes and navigation is performed through the screen rather than through separate tools, e.g. a mouse or touch pad.

From disparity to criteria

We do not intend to come up with absolute criteria from which it can be concluded that a survey is fit for smartphones or not. Rather, we construct a number of dimensions, and within these dimensions a number of scales, that allow for a gradual assessment of fitness. If a survey questionnaire scores high on multiple scales, then there is a higher risk of device-specific measurement error and/or item-nonresponse. The criteria themselves should be as clear as possible. Nonetheless, we suspect that some country/culture differences will always exist when it comes to the impact or risk.

The difference in presentation and timing of the interview between devices amounts to a focus on screen size, touch navigation and duration when developing criteria.

Screen size: In all cases, the criteria evaluate the size of survey items on a screen and thus the overall visibility of the items and the need to scroll. Partial invisibility of survey items may lead to confusion, underreporting of particular answer categories and respondent fatigue.

- Item introductions/instructions: Survey items may have opening text to explain terminology and conditions and to provide instructions to derive answers. Long introductions require more screen size. On smartphones introductions are often shortened, placed on a separate screen, hidden behind help buttons or avoided completely by changing wording of the questions.
- Grid questions: Grid questions are a series of survey items with the same answering categories on a relatively similar topic. They are presented as a whole and answering categories are shown only once. Grid questions form a block of items that demand more screen size or a different type of navigation. On smartphones grid questions require scrolling or navigation is changed through accordion, carousel or other modifications of the navigation.
- Question length: Survey items with longer question text (excluding introduction text) demand more space. On smartphones question text are shortened or scrolling is needed.
- Number of answer categories: The number of answer categories determines screen size of the item. On smartphones, items may be split into multiple items by introducing a hierarchy in the answer categories, thus avoiding scrolling, or require more scrolling.
- Answer category length: Survey items with longer answer category text demand more space. On smartphones answer category text are shortened or made smaller in order to avoid overly large buttons.

Initially, we also envisaged including the number of filter questions, where the follow-up questions appear on the same screen. There are however no criteria given by ESTAT on how to handle this, and the decision to show follow-up questions on the same screen is primarily a design question. We therefore dropped this criterion.

Touch navigation: In all cases, the criteria evaluate the conflict between visibility on the screen and the simultaneous need to use the screen for navigation. Such navigation may lead to typing errors and respondent fatigue.

- Open questions: Open questions require typing in the answer. For smartphones, a keyboard will appear which may overlap with the survey item. Furthermore, the open question text box needs to be touched first.
- Items with many answer categories: A often applied solution to survey items with many answer categories is the drop-down box which requires scrolling to search the right answer. Such scrolling can be (partly) avoided by typing in the first letters of the answer (auto-complete). For smartphones, such solutions demand for navigation on the touch screen which can be cumbersome.

Duration: Interview duration in combination with timing and location affect respondent motivation and concentration and break-off. Interview duration is deemed even more an issue for mobile devices due to the longer loading time of web pages and due to potential pauses in the internet connection.

- Number of survey items: The number of survey items directly affects the interview duration. Since most surveys contain filter questions, the number of survey items may vary per respondent. To date, long surveys are often blocked or discouraged for smartphones. There is a revived interest in split questionnaire design and panel questionnaire design.
- Person or household survey: In a household survey, multiple persons need to answer questions, making the survey longer and/or requiring the need to switch between persons or allow for proxy reporting. To date, household surveys are rarely if not encouraged for smartphones. Smartphones will be impossible when proxy reporting is not allowed.
- Interaction with classification database: Survey items with many and diverse answer categories, e.g. occupation, educational level or type of economic activity, often employ interaction with a classification database positioned at the server of the survey institute. Such interaction requires internet traffic and for smartphones may slow down the interview.

- Task complexity: Survey items that require extra effort from the respondent, e.g. calculations or searching for information in personal administration, take more time and may not be compatible with the time and location in which the respondent performs the survey.
- Enjoyment-relevance-burden: Surveys differ in their general enjoyment-relevance-burden scores to respondents. For online surveys, response rates may vary from 15% to 45% with the exact same data collection strategy in terms of invitation and reminder letters, text messages or emails. Such large differences express the perceived enjoyment-relevance-burden ratio to the general population. For smartphones, surveys that score weaker are at larger risk.

Operationalization of the criteria

Criteria should be as clear as possible, allowing for as little room as possible for subjective assessment. Fully objective assessment will not be possible, however, and in the assessment it is recommended to score a survey by at least two experts. We operationalize the various criteria as given in table 1.

Table 1: Fitness criteria

<i>Dimension</i>	<i>Criterion</i>	<i>Operationalization</i>
Screen size	Introductions	Number of items with introductions Number of items with instructions included
	Grid questions	Number of grids Average number of items per grid
	Question text	Number of items with > 20 words (excluding introduction text)
	# answer cat's	Number of items with > 5 answer categories
	Answer text	Number of items with > 10 words in at least one category
Touch navigation	Open question	Number of open questions
	Many answers	Number of items with > 25 answer categories
Duration	# of items	Total number of items Average duration of survey per respondent
	Household	Is survey a household survey? Yes/no
	Database	Does survey require interaction with a database? Yes/no
	Complexity	Number of (anticipated) items that require calculations by an average respondent, i.e. are cognitively burdensome Number of (anticipated) items that require consultation of personal documentation by an average respondent
	Enj-Rel-Bur	Response rate to traditional online devices

We score each survey on these three dimensions and 16 criteria.

The use of smartphones in ESS surveys

Within WP1 of MIMOD, a survey was fielded to all 31 ESS NSI's. One section of the survey concerned the possibility of completing ESS surveys on a smartphone. As a follow-up to this question, several other questions were asked. Here, we give a summary of the answers. Seven ESS surveys were selected for this purpose within MIMOD¹. These surveys are:

- European Health Survey (EHIS)
- EU Survey on Income and Living Conditions (EU-SILC)
- ICT Survey (ICT)

¹ These 7 surveys were selected to be the common set of social surveys to be investigated in MIMOD. Statistical Institutes were able to describe up to three additional surveys, however.

- Labour Force Survey (LFS)
- Adult Education Survey (AES)
- Harmonized European Time Use Survey (HETUS)
- Household Budget Survey (HBS)

Table 2 shows the number of countries that have an online option and, if they have, whether smartphones can be used and to what extent the questionnaire has been adapted. A first observation is that the majority of questions do not have an online option. A second observation is that if a survey can be done online, then only a few countries made slight adaptations. Hence, smartphones do not yet play a dominant role in questionnaire design.

Table 2: Possibility of using smartphones (Number of NSI's)

Survey	No web	Blocked	Not adapted but usable	Slightly adapted	Profoundly adapted
LFS	25	1	5		
EU-SILC	24	2	4	1	
EHIS	20	1	10		
AES	21	1	8	1	
ICT	16	3	10	2	
HBS	26	2	3		
HETUS	31				

Table 3 shows what kind of adaptations are made, for the EU-SILC, EHIS and ICT; the only three surveys for which some adaptation took place. If changes are made, it is to the structure of the questionnaire, the wording of questions, the navigation through the questionnaire or the way filter questions are used. However, adaptations are so rare that no general conclusion can be drawn.

Table 3: Number of NSI's making changes to design in the EU-SILC, AES and ICT surveys.

	EU-SILC			AES			ICT		
	No	Slight	Major	No	Slight	Major	No	Slight	Major
Structure		1			1		1	1	
# questions	1			1			2		
Checks	1			1			2		
Wording		1		1			2		
DK options	1			1			2		
Item NR	1			1			2		
Length	1			1			2		
Navigation	1				1		1	1	
Filter q's		1		1			2		

Table 4 shows a slightly different result than table 3 and summarizes the number of questions that have been adjusted. In the AES and ICT virtually no questions have been adjusted. In the EU-SILC some questions have been adjusted. But, again, adaptations are so rare that no general statements can be made.

Table 4: Number of NSI's making adaptations to no, some or many questions in the EU-SILC, AES and ICT surveys.

	EU-SILC			AES			ICT		
	No	Some	Many	No	Some	Many	No	Some	Many
Wording ans		1		1			2		
# answer cat		1		1			2		
Instr position		1		1			2		

Instr wording	1	1	2	
Grids	1		1	1
Other	1	1	1	

Finally, we end with some miscellaneous results from the survey: The NSI's indicated that all online surveys have been designed for desktops/laptops first and have later been adjusted. Only three countries use smartphone specific style sheets. In none of the surveys is the use of smartphones encouraged or made salient in any way. Four countries are working on smartphone applications, namely for HBS, HETUS and ICT. Surprisingly, given these results, 11 countries do pre-testing for multiple devices and browsers.

All in all, we conclude that smartphones are yet a future option for the selected ESS surveys and not yet daily practice in the ESS countries.

Selection of ESS surveys and model questionnaires

For time reasons, but also because HBS and HETUS innovation and use of smartphone applications are considered in separate task forces, we restrict ourselves to four surveys: EHIS, EU-SILC, ICT and LFS.

For each survey, we decided to consider both the Eurostat model questionnaire and two country-specific implementations. We do this, because model questionnaires leave room for specific choices by NSI's such as introduction texts to items or batteries of items, explanation of terminology, and, most importantly, extra country-specific questionnaire modules. The latter depends on the availability of administrative data and other, usually national, stakeholders that make use of the same survey data.

For the EU-SILC and LFS no model questionnaires exist, but, instead, Eurostat has disseminated a set of guidelines and recommended implementations. This implies that for these two surveys, there likely is more variation between NSI's in their country-specific implementations. As a consequence, recommendations about smartphone fitness become more uncertain as country-specific versions of the survey may have properties, e.g. length or extra blocks of grid questions, which complicate smartphone interview. This has to be kept in mind throughout the following.

Since for EU-SILC, we expect the most variation in implementation, a short inventory was made across MIMOD NSI's and some supporting NSI's. For EU-SILC, there indeed is a large variance in the design of the country-specific surveys (see table 5). As mentioned above, EU-SILC is not based on a specific model questionnaire, but on a common framework (guidelines) defined by harmonized lists of target variables. In consequence, the survey design is flexible and serves as a trade-off between standardization leading to a good comparability and flexibility leading to adaptations to national specificities in terms of infrastructure and measurement and thereby a maximized quality of data.

Each country-specific survey design of EU-SILC offers a different mix of survey (main) modes (interviewer- & self-administered, computer- & non-computer-assisted), which has also impact on some question designs too. Mostly interviewer-administrated modes and rarely self-administrated modes like PAP or CAWI. The total numbers of items differs from about 300 items to over 600 items.² The variance of modes and number of items leads to a country-specific average duration of interviews ranging from 12 minutes to more than 50 minutes. Moreover there are some but not all countries using register-data to reduce the extent of primary data collection. In case of EU-SILC, several countries make use of national registers, when complex income- and tax-related variables are collected, so that response burden can be reduced by using other data sources as

² First of all the variance might arise from the more flexible target variables of the guidelines, leading to a different number of items due to national specificities. Second it might also be different due to different modes. Third the difference might emerge due to the use of register-data in some countries. Fourth it depends if the EU-SILC ad-hoc modules are included in the total amount of items or not and last there might be different understanding regarding the definition of an item in comparison to question or variable.

complement. All those differences arising from the flexible survey design of EU-SILC led to the need to check the country-specific EU-SILC survey with its individual survey design when assessing its fitness for smartphones. Keeping that in mind, the following assessment on the fitness criteria is based on the recommended EU-SILC guidelines and a detailed assessment of the German EU-SILC PAP-questionnaire, complemented by a brief inventory on EU-SILC country-specific designs within the MIIMOD consortium members. .

Table 5 shows the difference in design of the country-specific EU-SILC surveys within the ESSnet MIMOD consortium.

Table 5: Selected, country-specific EU-SILC key survey indicators of surveys (MIMOD consortium-members)

<i>ESS-Countries (consortium)</i>	<i>Survey modes*</i>	<i>Total number of items</i>	<i>Avg. duration of interview(min.)*</i>	<i>Use of registerdata</i>	<i>Household- or individual-survey?</i>
DE	PAP	~330	55	No	HH
NL	CATI/CAWI	-	18.4	Yes	HH
IT	CATI/CAPI	~530	12.1	Yes	HH
NO	CATI	~350	55.1 ⁽²⁰¹⁵⁾	-	HH
AT	CAPI/CATI	~660	23.9	Yes	HH
FR	CAPI	~690	28.2	Yes	HH
FI	CATI	~320	-	Yes	HH
PL	PAPI/CAPI	~540	45.1	No	HH

*Source: EU-SILC ESQRS 2016 Annex 6 (Reference Metadata in ESS Standard for Quality Reports Structure)

Table 6 shows the survey assessments as they have been made within WP5.

Table 6: Assessments of the four selected ESS surveys by the three WP5 NSI's.

<i>Survey</i>		<i>CBS</i>	<i>DESTATIS</i>	<i>SSB</i>
EHIS	Model	X		
	Specific			X
ICT	Model	X		
	Specific	X	X	
LFS	Model			X
	Specific	X		X
EU-SILC	Model		X	
	Specific	X	X	

Results for the selected surveys

We discuss the results for the four selected surveys separately.

European Health Interview Survey (EHIS)

For the EHIS only two assessments are available, for the model questionnaire and for the specific implementation of the EHIS in Norway. The specific implementation at CBS is in preparation for 2019 and could not be scored yet. At CBS, the EHIS is implemented as a mix of web and CAPI. At SSB, it is implemented as CATI. The EHIS is usually integrated with an existing Health Survey that is on-going. The EHIS is fielded once every four years. Table 7 shows the scores on the fitness criteria. CBS assessed the 2019 model questionnaire and SSB the 2015 Norwegian EHIS.

Conclusions based on model questionnaire

- The review is done on the model questionnaire of the EHIS as it will be fielded in the Netherlands in 2019. The number of questions with instructions is a prominent feature. Also the items or answer options with additional instructions or examples is noticeable.
- For the introductions and instructions, is included both information to be read out loud for all respondents by the interviewers and including fully on the web designed questionnaire and clarification for the respondents.
- The inclusion of national questions complicates the assessment, both in terms of calculating average time, and regarding the questionnaire structure. Without the national variables, the number of questions and duration time would have been lower.
- There are a relative large number of questions that require calculation for determining the frequency of events or for consumption.
- Some questions have more than five answer categories.

Table 7: Score on fitness criteria for EHIS

Dimension	Criterion	Scores	
		Model	SSB
Screen size	Introductions	19	15
	Instructions	23	40
	Grids	0	0
	#item per grid	NA	NA
	Question text	1	14
	# answer cat's	5	4
	Answer text	0	0
Touch navigation	Open question	0	0
	Many answers	0	0
Duration	# of items	118	153 + 150
	Av duration	NA ³	34 min
	Household	No	No
	Database	Yes	No
	Cogntv burden	29	21
	Consultation	2	6
	Enj-Rel-Bur	35,9% (web) ⁴ 54,5% (total)	59% (CATI)

Conclusions Norway:

- The number of filtering questions is the most predominant trait⁵. This appears to have been done to adapt the health variable descriptions from the EHIS regulation for an aural mode by portioning out the stimulus. Most of the filter question is of the format “Have you done x during the reference period? Y/N”, followed up by either “what kinds of x was this? [list of response options to be read out loud]” or “how many times did you do x”. In a visual mode, it might be feasible to merge filter and follow-up without ending up with too long questions or too many response categories. This is also part of the discussion of whether to go for a unimode or a mode specific design which is addressed in WP4.

³ The duration of the model questionnaire is unknown. The CBS EHIS takes 34,5 minutes on average, but includes extra items, as it is integrated in the Dutch Health Survey

⁴ The reported response rates are for the CBS specific implementation of the EHIS that is integrated with the Dutch Health Survey.

⁵ Norway included the scoring of filter questions in their summary; other countries did not, see page 3.

- The number of questions with instructions is the second most striking feature. Here, we have included both information to be read out loud for all respondents, and clarification for either respondent- or interviewer-initiated dialogues.
- The inclusion of national variables complicates the assessment, both in terms of calculating average time, and regarding the questionnaire structure. Without the national variables, the number of branching questions e.g. would have been lower.
- 14 questions have more than 20 words. Questions where the response options were an integral part of the question and intended to be read out loud are included here. If these are not to be included, the number would be 10.
- There are quite a few questions that require calculation, for determining the frequency of events or for the consumption of alcoholic beverages. Many respondents will likely adopt a satisficing strategy to respond to these questions, regardless of mode.
- Several of the questions *could* have been implemented as grids in desktop web.
- Purely transitional introduction texts are included.
- The full Norwegian EHIS including national variable appears too long for mobile web. The subject matter, with many sensitive questions, is an argument in favour of self-administration. Therefore, we recommend a major revision of the national variables, instructions and branching questions in particular.

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

Due to a missing EU-SILC model questionnaire, DESTATIS evaluated the EU-SILC Guidelines and the country-specific questionnaire, complemented by CBS, assessing the EU-SILC Dutch implementation. Consequently, the assessment was limited to target variables rather than to questions. At DESTATIS, EU-SILC is a paper questionnaire. At CBS, EU-SILC is a mix of web and CATI.

To manage the issue of a missing model questionnaire with specific questions, we checked the methodological guidelines with its description of EU-SILC target variables provided by Eurostat. We identified 198 target variables that are recommended to survey via primary data collection. Then we checked our specific German EU-SILC survey and identified 148 of those 198 target variables. We took the 148 target variables transformed into 112 German EU-SILC questions as a base for the assessment of the fitness criteria below.

Table 8: Score on fitness criteria for EU-SILC

<i>Dimension</i>	<i>Criterion</i>	<i>Scores</i>	
		<i>DESTATIS</i>	<i>CBS</i>
Screen size	Introductions	0	34
	Instructions	43	42
	Grids	17	7
	#item per grid	7	5.7
	Question text	5	20
	# answer cat's	33	37
	Answer text	37	2
Touch navigation	Open question	5	16
	Many answers	5	0
Duration	# of items	329	262 (140 proxy)
	Av duration	55 min	32 min

Household	Mix ⁶	No ⁷
Database	No	No
Cogntv burden	1	9
Consultation	87	16
Enj-Rel-Bur	NA	33%

To get a better understanding of the quantified indicators below the condition of EU-SILC in Germany is as follows:

EU-SILC in Germany is a self-administered Paper and Pencil (PAP) survey. As it is containing a household-concept, it consists of a household questionnaire as well as an individual questionnaire for respondents over 16 years of age. In total the survey encompasses 157 survey questions. During the assessment we identified 35 questions that are not directly related to any target variable in the guidelines. Therefore we excluded those questions and focused on the remaining 112 survey questions (as mentioned above).

Conclusion EU_SILC Germany:

- In total the assessed German EU-SILC survey covers 112 survey questions with 329 items in total.
- Considering the integrated routing, an average respondent (employed, quite healthy adult with children in a rental apartment) has to deal with about 200 items, leading to an average interview-duration of more than 50 minutes. Surely in the context of computer-assisted modes the duration would be shorter, but still too long for smartphone use. Even though data can be entered by several settings, the amount and content is rather comprehensive and does not really apply for Smartphone data entry.
- The survey is a mix of a personal and a household questionnaire and the latter contains questions on both household level as well as on individual level. That concept needs to be restructured for smartphone use, as the changes between household and individual questions will become very confusing. Additionally taking into account the mix of individual and household questions will lead to a high proxy-interviewing and moreover break-off-rates, which should be avoided.
- The household questionnaire covers 17 multi-person grids, where the respondent has to reiterate those questions depending on the number of persons in the household. This is a special design of the paper-questionnaire that is not feasible for a completion via smartphone.
- Moreover - besides the 17 multi-person grids - a respondent has to deal with 17 regular grid-questions. With an average of 7 items per grid, the amount and design of those grids/ variables have to be revised or redesigned.
- A central characteristic of the EU-SILC survey is the detailed collection of numeric variables in the context of 'income', 'taxes', 'social benefits', 'credits' and 'housing costs' leading to 87 items that require the consultation of personal information by a respondent. Especially, when conducting a survey on a mobile smartphones you have to keep in mind that respondents may not always be in a situation to consult those detailed information. Here many respondents will either break off or adopt a satisficing strategy to respond to these questions. Respondents may understand that data entry is possible via Smartphone, but not advisable. However, the problem is, if people may continue on a different device, or may drop out entirely.
- 33 questions contain more than 5 answer categories. In context of small screen sizes, those questions need a careful re-design in order to ensure all necessary information are displayed at once. Furthermore the amount of those questions needs to be reduced.

⁶ 142 of the 329 items refer to the household, although they are answered by one person (proxy reporting is allowed)

⁷ For part of the survey items proxy reporting is not allowed and a member of the household core needs to answer the questions.

- More than one third of the questions (43) provide instructions. On the technical perspective the implementation of instructions on smartphones with small screens sizes might not be a problem, but in combination with the large amount of questions, this might be burdensome for smartphone users, as each instruction is to be clicked on, as space is limited for direct presentation. What technically is possible, will not help in reality, people will prefer to limit clicks, so that instruction are to be displayed directly on the screen.
- As a consequence German EU-SILC PAP on Smartphones is problematic on all three dimensions. There is either the option to redesign the survey, or to block the mobile device option. We recommend a revision of the survey itself regarding total number of items and the amount and design of grid questions. Furthermore the mix of household- and individual survey needs to be revised on smartphones or at least a careful technical implementation is necessary (dashboard). Content wise, items that need the consultation of personal information hold the risk of being inappropriate for smartphone respondents when being on the move. Therefore it is recommended to reduce those items to a minimum by e.g. using administrative data.

Conclusion based on EU-SILC guidelines⁸:

- There are 198 defined target variables to be provided by each country. If this data is delivered by primary data collection, the respondent will be burdened. Especially when responding via mobile devices the amount of target variables is extensive.
- Due to the possibility of using register-data, the need for primary data collection can be reduced. In case of Italy and the Netherlands it seems that the use of register-data reduces the average interview-duration to less than 20 minutes, which would be feasible for a self-administrated survey on mobile devices, while the average interview-duration in case of Germany and Poland (more than 45 minutes) is burdensome.
- About 30 target variables contain detailed items that require consultation of personal documentation. If those need to be answered by the respondent – as in case of e.g. Germany and Poland – this cannot be executed “mobile” while travelling and need later completion. So, easy open and close functions continue later is recommended and make the questionnaire functionalities demanding but feasible. If – as in case of e.g. Austria and Italy – the use of register-data provides all those complex variables without bothering the respondent, there won’t be any problem for smartphone respondents at all.

Consequently, the assessment of the EU-SILC target variables is ambivalent and cannot be observed without looking at the design of the country-specific EU-SILC surveys. Basically, the target variables surveyed only by mobile devices are not recommended due to amount and structure. Thus, register-data is extremely helpful, but not feasible in several countries. These aspects do advocate for a fundamental redesign of the entire survey, rather than adapting on and on

Conclusions Netherlands:

- Many survey items demand for screen size in terms of question length, introductions and instructions.
- Remarkable is the large number of open questions related to survey items with many answer categories. No use is made of long classification lists or databases, but this feature will be burdensome on a smartphone.
- A large number of items require consultation of personal files or are cognitively demanding. Here and there, we anticipate that a respondent will have to check with household members. The survey is not fit for completion anywhere and anytime.

⁸ Based on EU-SILC target variables, German PAP-assessment and key indicators of EU-SILC surveys

- The online response rate has an average value, indicating that the survey is neither considered very interesting or very burdensome.
- A disclaimer is needed that at Statistics Netherlands quite a few survey items are completed using administrative data from tax income data.

ICT Survey

The ICT is assessed by CBS and DESTATIS. CBS evaluated both the model questionnaire and the Dutch ICT. DESTATIS looked at the German ICT. At CBS, the ICT is a mix of web and CATI. At DESTATIS, the ICT is a paper questionnaire with a small part of the questions referring to the household as a whole.

Conclusions CBS for model questionnaire:

- The ICT is a relatively short survey.
- Question texts are long for many questions, due to the complexity of the topic. There also some questions with long answer texts.

Table 9: Score on fitness criteria for ICT

Dimension	Criterion	Scores		
		Model	CBS	DESTATIS
Screen size	Introductions	5	26	17
	Instructions	4	4	16
	Grids	1	23	0
	#Items per grid	6	2	NA
	Question text	13	39	26
	# answer cat's	7	13	10
	Answer text	3	16	5
Touch navigation	Open question	0	5	9
	Many answers	0	0	0
Duration	# of items	39	140	61 ⁹
	Av duration	NA	23 min	NA
	Household	No	No	No
	Database	No	No	2
	Cogntv burden	7	7	1
	Consultation	3	4	2
	Enj-Rel-Bur	NA	33.1% (web) 36.9% (CATI)	NA

Conclusions DESTATIS:

- ICT is a household survey, but using a household and an individual questionnaire.
- Generally, we suffer from long, detailed answering categories, besides of long lists of answering categories.
- Instructions are somewhat long, but could be managed with appropriate layers in smartphone design
- At least three times, data base connection is needed: economic sector, profession and education. All are demanding on smartphones.
- The questionnaire starts with more demographic basics than expected: 15 question.
- The list of country of birth is critical: > 50 countries; would be nice by a pull-down menu, but less advisable on Smartphones.

⁹ DESTATIS also has 8 household items. These are currently not included in the assessment.

- Answering categories integrate explanations, as the topic is rather difficult; therefore, redesign on wording and how to provide additional help is needed. This will be a big challenge.
- The observation reference period is problematic (at least for paper questionnaire): There are two observation reference periods, 3 and 12 month. This will end up critical on the smartphone, to be overlooked, more than on the PC/Laptop. The observation reference period seems a general problem for the ESS surveys, but turns out to accumulate when using small devices and a lot of questions, as the concentration is limited and visualization is limited too.

Conclusions CBS:

- The CBS ICT is much longer than the model questionnaire, roughly 100 questions are added, and will make it harder to redesign to smartphones.
- The ICT has many items that are problematic in screen size; question texts are often long, answer texts are sometimes long and quite a few items have introductions and/or instructions.
- ICT has a web response rate of around 33%, which is a moderate to good response rates compared to other surveys.

Labour Force Survey (LFS)

The LFS first wave is assessed by CBS and SSB. SSB considered both the model questionnaire/guidelines and the Norwegian LFS. At SSB, the LFS is CATI, but will be redesigned to include web. At CBS, the LFS is a mix of web, CATI and CAPI. There are very many paths through the questionnaire, dependent on employment status, job seeking activities and participation in education. This means that the number and complexity of questions will vary considerably per respondent. For this reason, it was decided to consider the Norwegian LFS for three distinct groups of respondents:

- A regular employee with a fixed working contract;
- An unemployed person seeking work;
- A student with a part-time job without a working contract.

Table 10: Score on fitness criteria for LFS

Dimension	Criterion	Scores				CBS
		Model	SSB			
			Employee	Unemployed	Student	
Screen size	Introductions	0	3	0	1	13
	Instructions	7	14	5	18	42
	Grids	0	0	0	0	4
	#Items per grid	NA	NA	NA	NA	NA
	Question text	1	2	1	2	76
	# answer cat's	18	1	4	3	41
	Answer text	14	1	0	0	4
Touch navigation	Open question	4	5	0	4	70
	Many answers	0	0	0	0	16
Duration	# of items	85	33	21	48	346
	Av duration	NA	NA	NA	NA	27 min
	Household	Yes	Yes	Yes	Yes	Yes
	Database	NA	No	No	No	Yes
	Cogntv burden	5	0	0	0	21
	Consultation	2	0	0	0	0
	Enj-Rel-Bur	NA	NA	NA	NA	22% (web) 54% (overall)

Conclusions SSB for the model questionnaire:

- The main problems with the LFS “model questionnaire”/un-operationalized variable list is the frequency of questions with five or more answer categories, and answer categories with 10 or more words.
- These features are of course at least partly connected to the fact that it is not an actual model questionnaire. It requires major adaptation into an actual questionnaire.

Conclusions SSB for Norwegian LFS:

- The most prominent characteristic is the number of questions with instructions, either displayed on the screen or available by clicking on icons.
- In the pilot LFS, instructions that are short and/or considered relevant for many or most respondents are always visible. Instructions that are relevant for smaller groups of respondents are available through clicking on icons.
- The part-time working student persona received the highest number of questions, the highest number of questions with additional instructions, and would most likely have had the most use of these instructions.
- The unemployed persona received the lowest number of questions and the lowest number of questions with additional instruction, but more questions with six or more response options.
- Using the mobile web fitness criteria, the first wave LFS pilot questionnaire is best suited for respondents that are unemployed, followed by employees with fixed working contracts. For students working part-time and other groups in a liminal position in the labour market, desktop web or interviewer-administered modes may be better suited due to many questions with additional clarification and instructions.
- As a side remark: The second to eight wave questionnaires are shorter than the first^t wave, and use previous wave data as well as register information, for dependent interviewing. For employed respondents who have not changed jobs, these follow-up interviews will be shorter and even better suited for mobile web than the questionnaire assessed.

Conclusions CBS:

- Out of the total number of 346 questions more than half is problematic on at least one criterion. 51 questions have two issues and 26 have three or more issues.
- The LFS is a household survey with average duration of 27 minutes in web. On the person level the average duration is, obviously, shorter and may reduce to around half, i.e. between 10 and 15 minutes.
- The LFS has relatively low web response rate of little over 20% (without incentives).

Translating scores to recommendations

The next step is to translate the scores on the 16 criteria to an overall score or much smaller set of scores that represent fitness. Ideally, this leads to a simplified recommendation

Green: Survey requires no specific adaptation (other than general mobile layout);

Yellow: Survey requires some adaptation;

Red: Survey requires (near) total redesign.

We have made such an overall assessment in two steps: First, we scored the three dimensions by averaging the number of criteria that scored good or bad. Second, we combined the three dimensions into a single score.

Table 11 shows an assessment of the three dimensions for the four surveys:

- **EHIS:** The EHIS screen size dimension is somewhat problematic because of the long introduction and many instructions. The navigation shows no problems. The duration is problematic.
- **EU-SILC:** The EU-SILC questionnaire is problematic on all dimensions. It has many questions that require sufficient screen size. There are open questions and questions with many answer categories. It is also a long survey that requires consultation of personal archives. The duration dimension may be less problematic when administrative data are used, as is done in some ESS countries, but even then will remain lengthy.
- **ICT:** The ICT survey scores good on both the navigation and duration dimensions for the model questionnaire. Country-specific implementations may be problematic on duration. The screen size dimension is problematic due to the large number of instructions, introductions and long questions/answers.
- **LFS:** The LFS is problematic on the screen size dimension; many questions require long texts. The navigation dimension is somewhat problematic due to open questions. The duration dimension is problematic for the household version of the LFS. On the person level, i.e. persons answering only questions that apply to themselves, the LFS may be doable. It must, however, be made clear that country-specific implementations of the LFS vary widely in length. A person level LFS following the model questionnaire/guidelines is doable in terms of duration.

Table 11: Scores on the three dimensions screen size, navigation and duration for each survey. The LFS is also assessed for the person level.

<i>Survey</i>	<i>Screen size</i>	<i>Touch navigation</i>	<i>Duration</i>
EHIS	Yellow	Green	Red
EU-SILC	Red	Red	Red
ICT	Red	Green	Green
LFS household	Red	Yellow	Red
LFS person	Red	Yellow	Green

What general conclusions can we draw? From table 11, we deduce that EU-SILC and LFS on the household level require a (near) total redesign for smartphones, i.e. score red. The picture for EHIS, ICT and LFS on the person level is more mixed and subtle. Here, we choose a yellow score, i.e. the surveys require some adaptation. Since the EHIS' duration is problematic, we do not recommend to encourage smartphones without a larger redesign in which split questionnaire or panel questionnaire designs are considered. For the ICT and LFS on the person level, smartphones may be encouraged, once adaptations have been implemented.

Recommendations

Out of the four surveys of this deliverable, two 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 LFS. 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.

We recommend to consider the ICT survey and the LFS on a person level for the remainder of WP5. For these two surveys responsive questionnaire designs will be considered and tested.

The handling of filter questions, and specifically the advantages and disadvantages of follow-up questions on the same screen, needs attention and further consideration.