

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 2

Responsive questionnaire designs for the LFS and ICT

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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. This second deliverable is a stepping stone to deliverable 3 and reports on the construction of responsive questionnaire designs for a person LFS and the ICT survey.

Introduction

Deliverable 2 of WP5 consists of responsive questionnaire designs for two selected ESS surveys. With this document we merely describe these designs. Deliverable 3 will report the outcomes of cognitive tests and usability tests using the designs.

In WP5 deliverable 1 (Schouten, Blanke, Gravem, Luiten, Meertens & Paulus 2018), we evaluated the EHIS (European Health Interview Survey), ICT survey, LFS (Labour Force Survey) and SILC (Survey on Income and Living Conditions) on their fitness for smartphones based on 16 criteria in three dimensions (screen size, touch navigation, duration), see table 1. Based on the evaluation, we recommended to explore smartphone usage in a person LFS, i.e. inviting only one selected member of the household, and the ICT survey. For this reason, we decided to choose the LFS and ICT as case studies for deliverable 2 and 3.

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

In the next section, we revisit the relevant outcomes of deliverable 1. In the last section, we describe the questionnaire designs of the LFS and ICT, as they are tested by CBS and SSB.

Background

In deliverable 1, the LFS and ICT were scored on 16 criteria. The results are given in tables 2 and 3, for the ICT and LFS, respectively. The ICT survey scores good on both the navigation and duration dimensions for the model questionnaire. The screen size dimension is problematic due to the large number of instructions, introductions and long questions/answers. The LFS turned out to be 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 4 shows the overall scores of the ICT and LFS on the three dimensions.

Table 2: 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 ¹
	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

Table 3: Score on fitness criteria for LFS

Dimension	Criterion	Scores				
		Model	SSB			CBS
			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)

¹ DESTATIS also has 8 household items. These are currently not included in the assessment.

Table 4: Scores on the three dimensions screen size, navigation and duration for each survey. The LFS is also assessed for the person level.

Survey	Screen size	Touch navigation	Duration
ICT			
LFS household			
LFS person			

Responsive questionnaire designs

For the two selected surveys, ICT and LFS, smartphone questionnaires are implemented and tested by CBS and SSB. SSB will test both the ICT and a person LFS. CBS will test only a person LFS. The focus in the tests is on general comprehension and usability, in particular for survey blocks and items that were scored as potentially problematic for smartphones.

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.

In the following two subsections, we give separate accounts of the LFS and ICT.

LFS smartphone survey

We present the choices that have been made at CBS.

Dimension 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.

Criterion 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. See figures 1 and 2 for examples.

In figure 1, the instruction “This includes looking for a job of only a few hours or any activities to start a business” is visualised in another character font, italic, and in different colour, light blue. Additionally, the reference period of four weeks is emphasized with underlining. In this design of the LFS questionnaire no additional instructions are included using clickable info buttons or the question mark as research pretends those are not used or read or on a smartphone covers the original question and answer texts.

The introduction in figure 2, is given in the same letter font and color with one white space between the question text.

Figure 1: Screenshot of LFS question *In the 4 weeks ending last week, have you done anything to find work?* Answer categories; Yes, No, Cannot say



Werkenquête

Heeft u in de afgelopen 4 weken iets gedaan om betaald werk te vinden?
Ook zoeken naar een kleine baan of voor uzelf beginnen telt mee.

Ja

Nee

Geen antwoord

Vorige Volgende

Figure 2: Screenshot of LFS question *In the week from Monday the [date] to Sunday the [date], have you done any work for pay or profit?*



Mail 15:26 67%

prepenquete2.cbs.nl

Werkenquête X Onderbreken ? Help

De volgende vragen gaan over werk.

Heeft u vorige week betaald werk verricht? Ook werk voor 1 uur telt al mee.
Met de vorige week wordt bedoeld vorige week maandag t/m afgelopen zondag.

Ja

Nee

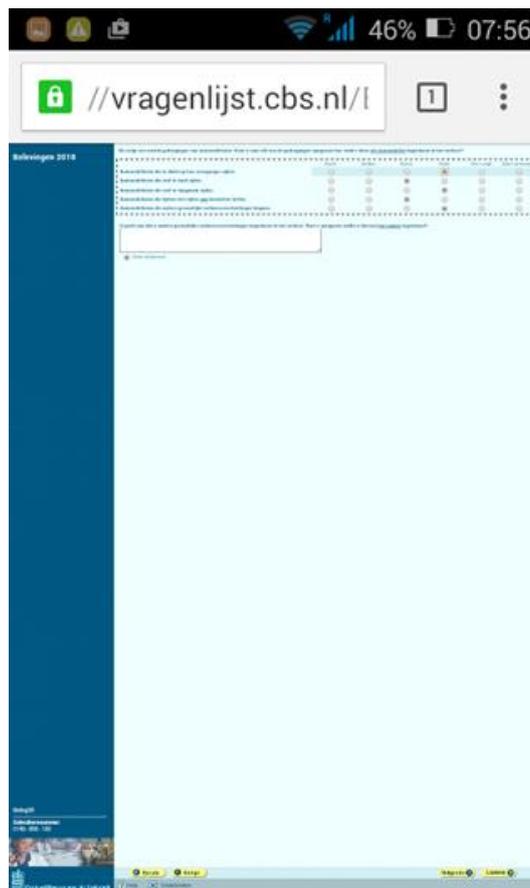
Vorige Volgende

Criterion 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.

In general, if there is no adaptation for a responsive design for grid questions, than it is possible that as Figure 3 shows, the grid is not readable, and there is an overall risk of data quality and potential risk of drop off.

Figure 3: Example of grid questions in non-responsive design (Blaise 4 design).



For the smartphone, grid questions have been transformed to multiple single choice questions, see figure 4. The questions are designed on a smartphone style sheet as one by one single items and respondent needs to scroll. On the tablet and PC version, grid questions still are presented as a grid, see figure 5.

Further developments for grid questions are on-going at the time of writing. There are possible risks of device effects or data quality as in this design the stem of the question: *What have you done in the last 4 weeks to find work?* is not visible anymore after scrolling the 8 items. As it contains a reference period of four weeks, this might have an effect on the answer pattern of these job search methods and might be different from the PC/tablet version where it is a grid design and all the items are visible at one screen.

In the LFS tests, a second version which fixes the stem of the question is investigated. In this version, the stem is visible for each single item. Then it is assured that every respondents gets the same stimulus. This will be tested together with the functionality of auto scroll, i.e. each single option appears without the necessity to scroll.

Figure 4: Example from LFS questions on Sub module Job search methods What have you done in the last 4 weeks to find work?

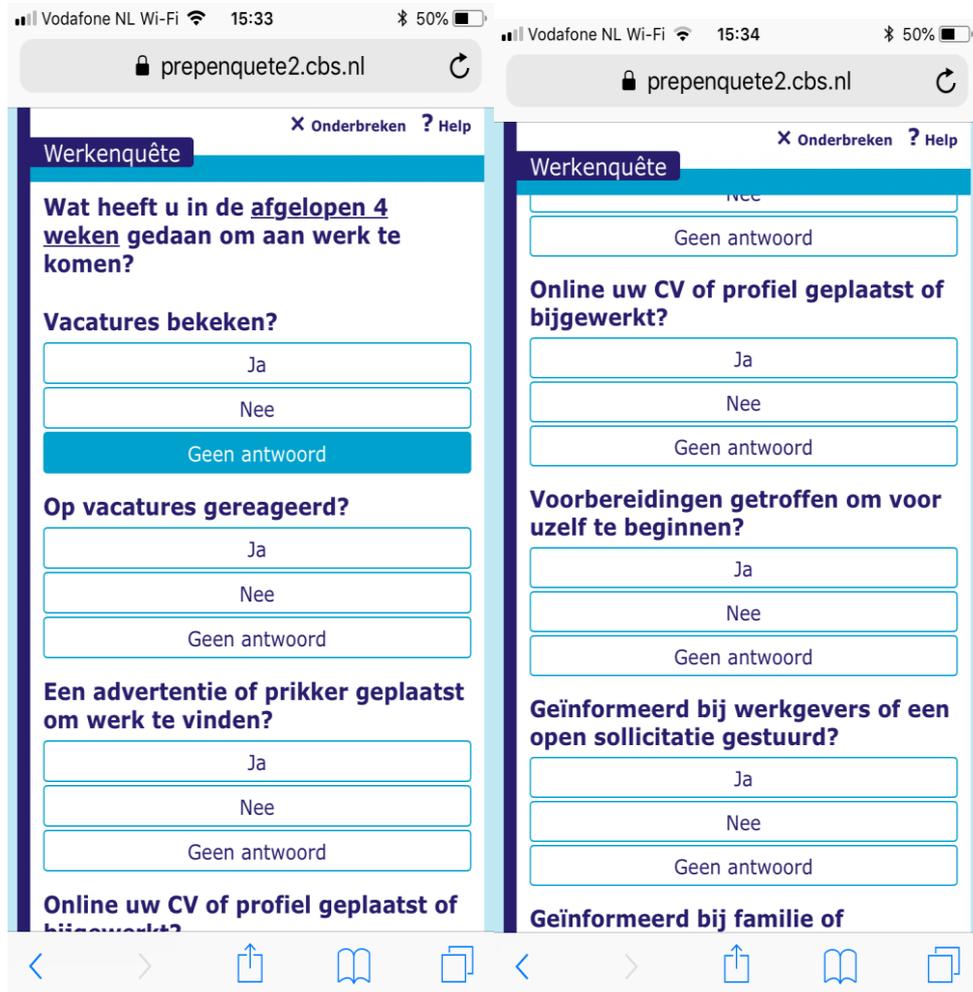


Figure 5: Example of grid questions on PC/laptop and tablet for LFS question on Sub module Job search methods.

X Onderbreken ? Help

Werkenquête

Wat heeft u in de afgelopen 4 weken gedaan om aan werk te komen?

	Ja	Nee	Geen antwoord
Vacatures bekeken?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Op vacatures gereageerd?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Een advertentie of prikker geplaatst om werk te vinden?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Online uw CV of profiel geplaatst of bijgewerkt?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Vorbereidingen getroffen om voor uzelf te beginnen?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Geïnformeerd bij werkgevers of een open sollicitatie gestuurd?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Geïnformeerd bij familie of vrienden?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Contact gehad met een uitzend-, bemiddelings- of detacheringsbureau?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Contact gehad met het UWV werkbedrijf?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Een sollicitatiegesprek gehad of een assessment of test gedaan?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Vorige Volgende

Criterion Question length

Survey items with longer question text (excluding introduction text) demand more space. On smartphones question text are shortened or scrolling is needed. In general, the question text is shortened as much as possible. Maximum of two (interrelated) questions at one screen. No scrolling is needed, except with the grid question. See figure 6 for an example.

Figure 6: Two questions on one screen demographic questions on age and marital status.

The screenshot shows a mobile browser interface for a survey titled 'Werkenquête'. The browser address bar shows 'prepenquete2.cbs.nl'. The survey content includes two questions:

- Wat is uw leeftijd?** with a text input field.
- Wat is uw burgerlijke staat?** with a subtext: 'Het gaat erom hoe u bij de gemeente geregistreerd staat.' and four radio button options: 'Gehuwd / geregistreerd partnerschap', 'Voor de wet gescheiden', 'Weduwnaar / weduwe', and 'Nooit gehuwd geweest'.

Navigation buttons 'Vorige' and 'Volgende' are located below the second question. The bottom of the screen shows standard mobile browser navigation icons.

Criterion Number of answer categories

The number of answer categories determines the required 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. See figure 7 for an example.

Figure 7: Example of smartphone design of LFS question What is the main reason that you cannot start within 2 weeks? Answer categories are: School or study, Sickness or disability, Looking after children, relatives or friends, Other family matters, Any other reason and Cannot say. In case answer category Any other reason is clicked, an open text field is shown to type the additional reason (at the same screen).



Criterion 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. See the example in figure 8. The third answer option Working in the business owned by a partner or family member has a larger answer category box due to answer question length.

Figure 8: Screenshot of different answer category text.

The screenshot shows a mobile browser interface for a survey titled 'Werkenquête'. The URL is 'prepenquete2.cbs.nl'. The page content includes the following text:

De vorige vraag ging over uw werk in de vorige week. De volgende vragen gaan over uw werksituatie in het algemeen.

Op welke manier(en) bent u werkzaam?

Meerdere antwoorden mogelijk.

Four radio button options are listed in white boxes with blue borders:

- Ik heb een baan als werknemer
- Ik ben zelfstandige of freelancer
- Ik werk mee in het bedrijf/praktijk van mijn partner of een familielid
- Anders

At the bottom of the question area are two dark blue buttons: 'Vorige' and 'Volgende'. The mobile status bar at the top shows 'Mail', signal strength, Wi-Fi, time '15:27', and battery level '67%'.

Dimension Touch navigation

In all cases, the touch navigation 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.

Criterion 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.

An example is presented in figure 9. Two questions on one screen with open text field to fill in name of occupation and profession. In the instruction (in blue) information of being specific and elaborating on the profession, so for example not methodologist, but survey methodologist. In this LFS pilot a research goal is to see whether this yields the same quality of data used to code occupations in the Netherlands and international CASCOT.

Figure 9: Screenshots of open questions asking for occupation and working activities



The lay-out of figure 10 is an alternative visual design that has a more elaborated instruction on giving a description of the occupation and is visually more structured. This version will be included in the usability testing. Also, the questions on occupation and working activities is divided over two screens instead of a combination on one screen.

Figure 10: Question on occupation with elaborated version of instruct text and visual more structured

The screenshot shows a mobile browser interface for a survey. At the top, the status bar shows 'T-Mobile NL', signal strength, Wi-Fi, time '11:16', and battery. The browser address bar contains 'prepenquete2.cbs.nl'. The survey title is 'Nationale Enquête Arbeidsomstandigheden'. The main heading is 'De volgende vragen gaan over uw beroep.' followed by the question 'Welk beroep of welke functie oefent u uit?'. Below the question is a paragraph of instructions: 'Probeer in de omschrijving zo specifiek mogelijk te zijn, bijvoorbeeld door een specialisme of niveau op te geven.' There are two columns of examples: 'Dus niet:' with 'Manager', 'Verpleegkundige', and 'Monteur'; and 'Maar liever:' with 'Manager automatisering, Manager zorg, Financieel Manager', 'Psychiatrisch verpleegkundige, Verpleegkundige niveau 4, Verpleegkundige op de spoedeisende hulp', and 'Automonteur, Monteur elektrotechniek, Machinemonteur'. A text input field is located below these examples. At the bottom of the survey area are two buttons: 'Vorige' and 'Volgende'. The mobile OS navigation bar at the very bottom shows back, forward, share, book, and tabs icons.

Criterion Items with many answer categories

An 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.

Figure 11: Screenshot of old web design (only PC/laptop) and responsive smartphone and tablet design:

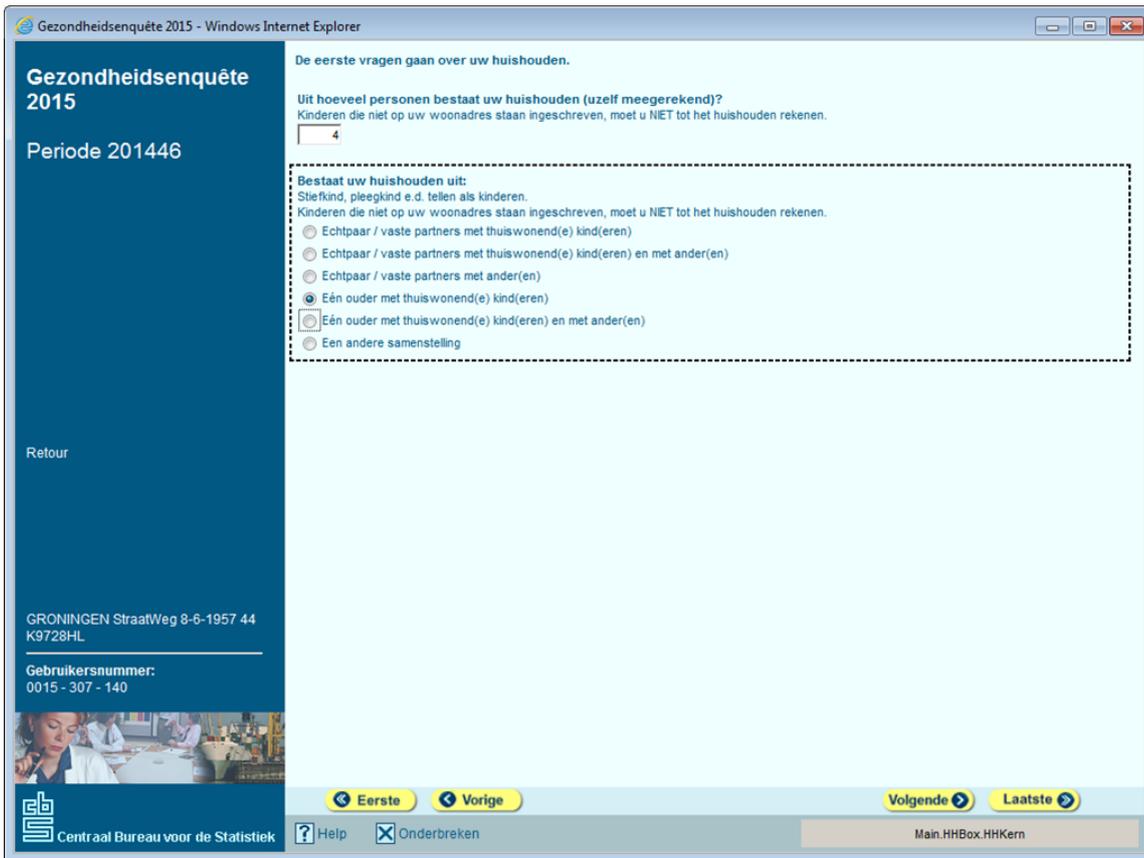
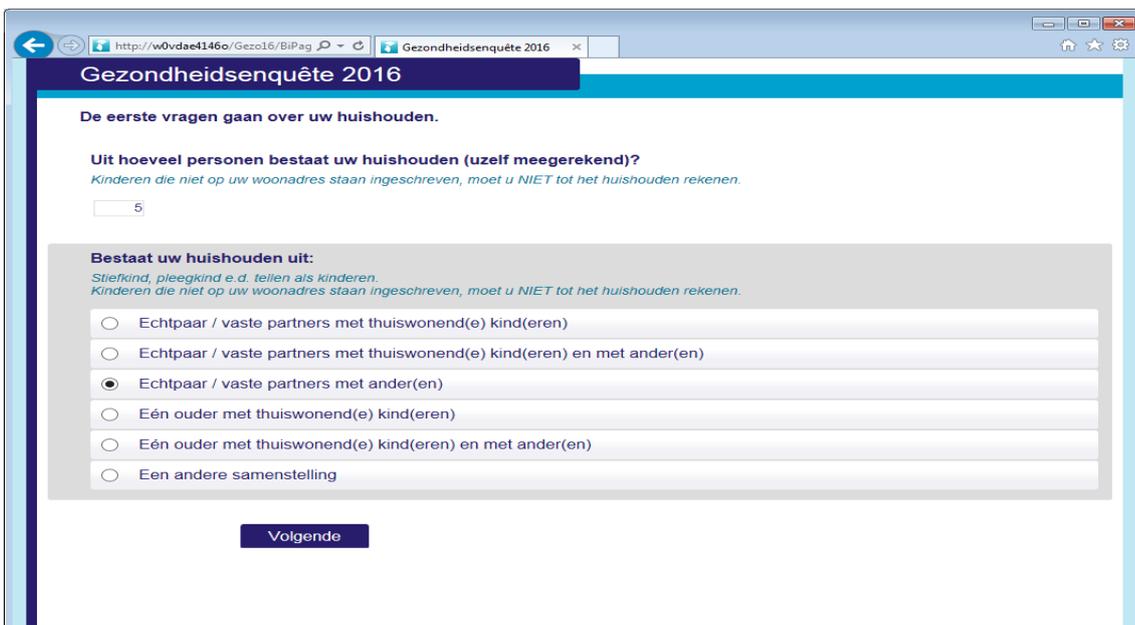


Figure 12: Screenshot of new responsive design (Blaise 5).



For all devices PC/tablet/smartphone touch navigation with touchscreen/big buttons for the entire answers categories (no need to click on the circle, the whole space of the banner of answer category is possible)

ICT smartphone survey

We present some choices that have been made at SSB.

The web ICT questionnaire for the tests is based on the existing CATI questionnaire. This in turn is based on the ICT model questionnaire, with few modifications to structure or wording. The largest differences is that “check all that apply” table questions have been made into batteries of single yes/no questions, as seen in figures 13 and 14.

This adaption in theory makes sense for both a uni-mode and web mobile mode: The same stimulus will be presented (no open questions with interviewer coding in CATI), and there will be room enough for all the text on a mobile screen.

Figure 13: ICT model questionnaire layout, question A2

A2.*	What types of internet connections are used at home? <i>(tick all that apply)</i>	
	<i>Broadband connections*</i>	
	a) Fixed broadband connections, e.g. DSL, ADSL, VDSL, cable, optical fibre, satellite, public Wi-Fi connections	<input type="checkbox"/>
	b) Mobile broadband connections (via mobile phone network, at least 3G, e.g. UMTS, using (SIM) card or USB key, mobile phone or smart phone as modem)	<input type="checkbox"/>
	<i>Other, narrowband connections</i>	
	c) Dial-up access over normal telephone line or ISDN (optional)	<input type="checkbox"/>
	d) Mobile narrowband connection (via mobile phone network less than 3G, e.g. 2G+/GPRS, using (SIM) card or USB key, mobile phone or smart phone as modem) (optional)	<input type="checkbox"/>

Figure 14: ICT Norwegian uni-mode questionnaire adaption, question A2a

Bruker husholdningen en fast bredbåndsforbindelse, for eksempel via ADSL, kabel-TV, fiberkabel eller satellitt?
Bredbånd er en betegnelse brukt om signaloverføring av en viss minimumshastighet (vanligvis raskere enn ISDN).

Ja

Nei

Vet ikke

Ønsker ikke å svare

◀ ▶

In the case of model questionnaire item B2 “How often on average did you use the Internet in the last 3 months?”, this is rephrased with the response options as an integrated part of the question for both CAWI and CATI (figures 15 and 16).

Figure 15: ICT model questionnaire layout, question B2

B2.	How often on average did you use the internet in the last 3 months?	
*	(tick one)	
	a) Every day or almost every day -> go to B2.1	<input type="checkbox"/>
	b) At least once a week (but not every day) -> go to B3	<input type="checkbox"/>
	c) Less than once a week -> go to B3	<input type="checkbox"/>

Figure 16: ICT Norwegian uni-mode questionnaire adaption, question B2

I løpet av de siste 3 månedene, vil du si at du brukte Internett i gjennomsnitt...

hver dag eller nesten hver dag

minst en gang i uken, men ikke hver dag (mellom én og fire ganger hver uke)

mindre enn en gang i uken

Vet ikke

Ønsker ikke å svare

◀
▶

The draft questionnaire in its entirety will be available at <https://blaise5test.ssb.no/ikt18/> until the tests are completed.