SHARE WAVE 9 METHODOLOGY:

From the SHARE Corona Survey 2 to
the SHARE Main Wave 9 Interview

SHARE

SURVEY OF HEALTH, AGEING
AND RETIREMENT IN EUROPE

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CHAPTER 1

SHARE Wave 9 Methodology: From the SHARE
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1 SHARE WAVE 9 METHODOLOGY: FROM THE SHARE CORONA SURVEY 2 TO THE SHARE MAIN WAVE 9 INTERVIEW

Michael Bergmann, Melanie Wagner and Axel Börsch-Supan

1.1 Overview

In spring 2020, in the middle of Wave 8, the Survey of Health, Ageing and Retirement in Europe (SHARE) had to suspend its regular face-to-face interviewing due to the outbreak of the COVID-19 pandemic. Only three months later, in summer 2020, the first SHARE Corona Survey (SCS1) was conducted by phone to collect data about the health and living situation of the 50+ population in Europe during the global pandemic. One year later, in summer 2021 and again by phone, Wave 9 fieldwork started with the second SHARE Corona Survey (SCS2), which re-interviewed respondents of the first SHARE Corona Survey, enabling to study (intra-individual) changes between the start of the pandemic and the situation one year later in a cross-national perspective. Scientific results on the social, health and economic impact of the COVID-19 pandemic and the epidemiological control measures can be found in Börsch-Supan et al. (2023). In October 2021, SHARE returned to the regular face-to-face interviewing for the regular SHARE Wave 9 survey (see Figure 1.1).

Other than anticipated, the pandemic was still ongoing and the governmental responses to the situation differed a lot in the countries participating in SHARE, which is why fieldwork lasted until the beginning of September 2022. Despite the exceptional circumstances, fieldwork performance was remarkable in many countries. All survey agencies together managed to collect about 70,000 interviews in the regular fieldwork of Wave 9 with the help of roughly 2,000 interviewers across 27 European countries and Israel.

Figure 1.1: Data Collection Scheme
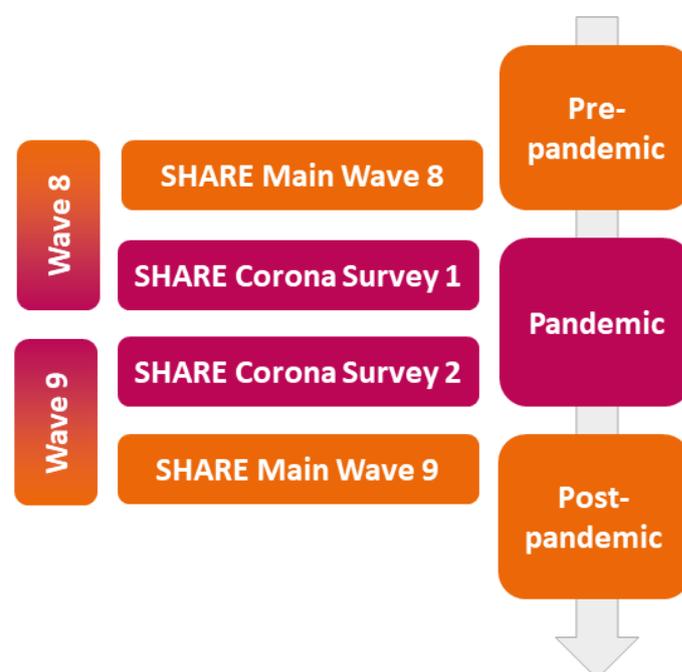
This volume documents the most important questionnaire innovations, methodological advancements and new procedures introduced during the second SHARE Corona Survey and the regular ninth wave of SHARE. SHARE is a research infrastructure aimed at better understanding and coping with the challenges and opportunities of population ageing (Börsch-Supan et al., 2013). Its main objective is to provide excellent data to study the effects of health, social, economic and environmental policies over the life-course of European citizens and beyond through a combination of: (a) transdisciplinarity by studying the interactions between biomedical and socio-economic factors; (b) longitudinality by combining a prospective panel structure and retrospective life histories; and (c) European coverage with strict cross-national comparability by the use of ex ante harmonised survey tools and methodologies. All countries are on the same fieldwork schedule, use the same survey specifications given by a model contract, and administer the same questionnaire and interviewing software. In addition, data collection and

response rates in all countries are centrally monitored. Unless mentioned otherwise, the following chapters are based on preliminary SHARE Wave 9, Release 0 data (Börsch-Supan, 2023) that were available at the time of writing.

The present volume is structured as follows: Firstly, Michael Bergmann, Arne Bethmann and Giuseppe De Luca outline the sampling procedures that were followed to continue the suspended Wave 8 refreshment samples in the regular Wave 9 of SHARE to draw inferences about the population of people aged 50 years or older across countries (Chapter 2). Next, Yasemin Yilmaz, Elena Sommer, Barbara Thumann and Axel Börsch-Supan present the general framework and contents of the second SHARE Corona survey laying down the main guiding principles for designing the SCS2 and content adaptations regarding the respondents' experiences in work, care, or social relations during the pandemic (Chapter 3). In Chapter 4, Theresa Fabel, Yuri Pettinicchi, Elena Sommer and Barbarea Thumann give an overview of changes in the regular Wave 9 questionnaire, focusing on the changes to the End-of-Life interview to account for the impact of the COVID-19 pandemic to the life of the SHARE respondents who passed away during the pandemic. In Chapter 5, Karin Schuller, Magdalena Hecher, Jeny Tony Philip and Iggy van der Wielen give an overview of the software innovations in SHARE Wave 9, which were implemented to conduct both telephone and face-to-face interviews. They discuss the technical design and programming of the instruments that involved various updates to the existing systems and tools. Next, innovations on fieldwork monitoring and survey participation in both the second SHARE Corona Survey and the regular SHARE Wave 9 are presented by Jeny Tony Philp, Karin Schuller, Magdalena Hecher and Gregor Sand in Chapter 6. In addition, Tessa-Virginia Hannemann and Michael Bergmann describe the back-checking procedure to guarantee data quality in the second SHARE Corona Survey and the regular SHARE Wave 9 (Chapter 7). Afterwards, Giuseppe De Luca and Paolo Li Donni provide a description of the weighting and imputation strategies used for dealing with problems of unit non-response, sample attrition and item non-response (Chapter 8).

Finally, Chapters 9 and 10 describe additional data that enhance the collected responses from our respondents in SHARE. In this respect, Magdalena Quezada, Tessa Hannemann and Michael Bergmann first describe the interviewer survey, which has been conducted in 23 countries and for the fourth time in SHARE. This additional survey will enhance research on interviewer effects and substantially enrich the analytical potential of the SHARE microdata in general (Chapter 9). Second, Salima Douhou and colleagues describe the Harmonized Cognitive Assessment Protocol (HCAP) project that was conducted in addition to the regular SHARE Wave 9. These data will help us better understand different pathways of cognitive ageing, while at the same time harmonise our data with other aging studies in the world (Chapter 10).

1.2   Acknowledgements

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CHAPTER 2

Continuation of Refreshment Samples in Wave 9 after the Suspension of Fieldwork in Wave 8

02

2 CONTINUATION OF REFRESHMENT SAMPLES IN WAVE 9 AFTER THE SUSPENSION OF FIELDWORK IN WAVE 8

Michael Bergmann, Arne Bethmann and Giuseppe De Luca

2.1 Introduction

The aim of the SHARE survey design is to be able to draw inferences about the population of people aged 50 years and older across countries by using probability-based sampling procedures. This general principle was maintained in Wave 9, although the uncertainty associated with the on-going COVID-19 pandemic prevented the drawing of new refreshment samples. Instead, the already drawn and only partly fielded refreshment samples from Wave 8 were carefully cleaned and processed to allow for proper interviewing in Wave 9. In this chapter, we thus do not repeat the description of the sampling design adopted in the eighth wave of SHARE (for detailed information on this, see Bergmann et al., 2021), but give an overview of the considerations and necessary data preparations to continue data collection of the refreshment samples in Wave 9 that were originally drawn beforehand Wave 8.

2.2 The SHARE Target Population in Wave 9

Because the refreshment samples in Wave 9 present a continuation of Wave 8 fieldwork, the target population of Wave 9 has been defined as the 50+ population in 2019 that survives up to 2021 (i.e., the beginning of the data collection process in Wave 9), who have their regular domicile in the respective SHARE country, to draw proper inferences for the 50+ population in 2021 when most respondents did their interview. As usual, persons are excluded if they were incarcerated, hospitalised or living abroad throughout the entire survey period, unable to speak the country's language(s)[1], could not be located due to errors in the sampling frame (e.g. non-existent address, vacant house) or have moved to an unknown address. Spouses/partners of people aged 50 years and over are included in the target population, regardless of their own age, because the household level is important for many of the variables collected in SHARE. Therefore, the target population of SHARE could also be defined in terms of households, i.e. all households with at least one member belonging to the target population of individuals. In contrast to many other studies, SHARE also includes persons living in nursing homes and residential care whenever they are covered in the sampling frame from which the baseline/refreshment samples are drawn (whether this is the case differs between countries; see Schanze, 2017). Further information on eligibility for the study can be found in the SHARE Release Guide that is publicly available on the SHARE-ERIC website (www.share-eric.eu/).

2.3 The SHARE Sampling Protocol

Unlike in previous waves, the SHARE sampling protocol for Wave 9 was in large parts identical to that for Wave 8. As no new refreshment samples were drawn for Wave 9, the SHARE Sampling Coordination team prepared the partly fielded Wave 8 refreshment samples based on the completed Gross Sample Template (GST) in the 18 countries that planned a refreshment at that time (Austria, Belgium, Switzerland, Czech Republic, Germany, Denmark, Estonia, Spain, Finland, France, Croatia, Hungary, Israel, Latvia, Poland, Portugal, Sweden and Slovenia; see Table 2.1). This template contains all selected persons or households drawn in Wave 8, the associated sampling frame information needed for the computation of selection probabilities (e.g. household-level and population-level information on stratification and clustering), household-level information on NUTS and LAU codes[2] and (if any) additional auxiliary variables that could be used for ex post compensation of non-sampling errors.

For Wave 9, the GST from Wave 8 provided the input that was updated with information from the Wave 8 face-to-face fieldwork regarding activated batches. Refreshment households from batches that were active during Wave 8 but could not be interviewed until suspension of fieldwork were fielded accordingly in Wave 9, independent of previous contacts,

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1   If a language is spoken by more than ten per cent of the population in a certain country, the questionnaire is also translated into that language to include the language group in SHARE and to avoid under-coverage of important migrant groups.
2   Nomenclature of Territorial Units for Statistics (NUTS) and Local Administrative Units (LAU); see Eurostat (2022).

appointments, or Coverscreen information. In contrast, refusals, the death of respondents, and data/address deletion requests were carefully considered and these cases were not fielded again. Refreshment households from batches that were not fielded during Wave 8 were also prepared to meet the planned number of interviews if necessary. This also included Spain, Finland and Portugal, where the drawn refreshment samples could not be fielded before the suspension of Wave 8 fieldwork due to the COVID-19 outbreak in spring 2020. The thus processed and cleaned samples formed the refreshment sample part (in addition to the panel sample) of the Sample CTRL software (see Chapter 5) that is used to assign respondents to the interviewers' laptops.

2.4 Sample Composition

In Wave 8, all countries that drew a refreshment sample except Switzerland, Denmark, Estonia, Portugal and Sweden selected the full age range of people born in 1969 or earlier to compensate for the effect of panel attrition on all age cohorts (see Bergmann et al., 2021). Where possible, these full-range refreshment samples included an oversampling of the youngest cohorts that were not age-eligible in the previous refreshment samples to maintain the representation of younger age cohorts. Switzerland, Denmark, Estonia, Portugal and Sweden followed a different strategy and only sampled the youngest age cohorts that were mostly missing by design. Table 2.1 gives an overview of all countries that ever participated in SHARE up to Wave 9 and the composition of their samples in the respective wave(s).

Table 2.1: Sample Type by Wave and Country

Country	Wave 1	Wave 2		Wave 3	Wave 4		Wave 5		Wave 6		Wave 7		Wave 8		Wave 9	
	Baseline	Panel	Refreshment / Baseline	Panel	Panel	Refreshment / Baseline	Panel	Refreshment / Baseline	Panel	Refreshment / Baseline	Panel	Refreshment / Baseline	Panel	Refreshment / Baseline	Panel	Refreshment / Baseline
AT	≤1954	✓		✓	✓	≤1960	✓		✓		✓		✓	≤1969	✓	continued
BE_FR	≤1954	✓	≤1956	✓	✓	≤1960	✓	≤1962	✓	≤1964	✓		✓	≤1969	✓	continued
BE_NL	≤1954	✓		✓	✓	≤1960	✓	≤1962	✓	≤1964	✓		✓	≤1969	✓	continued
BG												≤1966	✓		✓	
CH	≤1954	✓	≤1956	✓	✓	≤1960	✓		✓		✓		✓	[1962-1965]	✓	continued
CY												≤1966	✓		✓	
CZ			≤1956	✓	✓	≤1960	✓	≤1962	✓		✓		✓	≤1969	✓	continued
DE	≤1954	✓	≤1956	✓	✓		✓	≤1962	✓		✓		✓	≤1969	✓	continued
DK	≤1954	✓	≤1956	✓	✓	[1957-1960]	✓	≤1962	✓	[1963-1964]	✓		✓	[1967-1969]	✓	continued
EE						≤1960	✓		✓	[1963-1964]	✓		✓	[1965-1969]	✓	continued
EG								≤1962	✓		✓		✓		✓	
ES	≤1954	✓	≤1956	✓	✓	≤1960	✓		✓		✓		✓		✓	≤1969
FI												≤1966	✓		✓	≤1969
FR	≤1954	✓	≤1956	✓	✓	≤1960	✓		✓	≤1964	✓		✓	≤1969	✓	continued
GR	≤1954	✓	≤1956	✓					✓	≤1964	✓		✓			
HR										≤1964	✓	≤1966	✓	≤1969	✓	continued
HU						≤1960					✓		✓	≤1969	✓	continued
IE			≤1956	✓												
IL	≤1954	✓	≤1956				✓	[1953-1962]	✓		✓	≤1966	✓	≤1969	✓	continued
IT	≤1954	✓	≤1956	✓	✓	≤1960	✓	≤1962	✓	≤1964	✓		✓			
LT												≤1966	✓		✓	
LU								≤1962	✓	≤1964	✓		✓			
LV												≤1966	✓	≤1969	✓	continued
MT												≤1966	✓		✓	

Country	Wave 1 Baseline	Wave 2 Panel	Wave 2 Refreshment / Baseline	Wave 3 Panel	Wave 4 Panel	Wave 4 Refreshment / Baseline	Wave 5 Panel	Wave 5 Refreshment / Baseline	Wave 6 Panel	Wave 6 Refreshment / Baseline	Wave 7 Panel	Wave 7 Refreshment / Baseline	Wave 8 Panel	Wave 8 Refreshment / Baseline	Wave 9 Panel	Wave 9 Refreshment / Baseline
NL	≤1954	✓	≤1956	✓	✓	≤1960	✓	≤1962	✓		✓		✓		✓	
PL			≤1956	✓	✓				✓	[1963-1964]	✓	≤1966	✓	≤1969	✓	continued
PT						≤1960			✓		✓		✓		✓	[1961-1969]
RO												≤1966	✓		✓	
SE	≤1954	✓	≤1956	✓	✓		✓	≤1962	✓		✓		✓	[1955-1969]	✓	continued
SI						≤1960	✓	≤1962	✓	≤1964	✓		✓	≤1969	✓	continued
SK												≤1966	✓		✓	

Note:

≤1966	Baseline sample
≤1969	Full-range refreshment sample
[1967-1969]	Refreshment sample of youngest cohorts only

All SHARE respondents who were interviewed in any previous wave and were not dropped due to data cleaning rules[3] are part of the longitudinal sample, i.e. also those refreshment cases that have been interviewed in Wave 8 before the suspension of fieldwork. This also includes non-responding partners of panel members who were interviewed in a previous wave. All other households that were drawn beforehand Wave 8 and in which a household member had her/his first interview due to Corona only in Wave 9 count as (follow-up) refreshment interviews in that wave. Table 2.2 presents an overview of the realised refreshment and longitudinal interviews (incl. End-of-Life interviews) based on SHARE Wave 9, Release 0 (Börsch-Supan, 2023).

Table 2.2: Number of Realised Interviews from Longitudinal and Refreshment Samples of Wave 9 by Country

Country	Individuals			Households		
	Longitudinal	Refreshment (follow-up to Wave 8)	Total	Longitudinal	Refreshment (follow-up to Wave 8)	Total
AT	2492	1095	3587	1792	821	2613
BE_fr	1644	506	2150	1281	427	1708
BE_nl	2094	380	2474	1509	299	1808
BG	889		889	605		605
CH	1680	204	1884	1207	162	1369
CY	764		764	473		473
CZ	2655	908	3563	1869	666	2535
DE	2652	1884	4536	1774	1416	3190
DK	2218	220	2438	1603	170	1773
EE	4096	672	4768	3021	498	3519
ES	1697	495	2192	1139	372	1511
FI	1155	615	1770	758	508	1266

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3   Sample cleaning rules in SHARE can be found at https://share-eric.eu/data/faqs-support (see point 3.8).

Country	Individuals			Households		
	Longitudinal	Refreshment (follow-up to Wave 8)	Total	Longitudinal	Refreshment (follow-up to Wave 8)	Total
FR	2202	776	2978	1578	579	2157
GR	3267		3267	2129		2129
HR	1985	2818	4803	1268	1873	3141
HU	1273	738	2011	884	487	1371
IL	582	224	806	416	155	571
IT	3874		3874	2474		2474
LT	1470		1470	1053		1053
LU	823		823	577		577
LV	996	783	1779	704	518	1222
MT	895		895	543		543
NL	2150		2150	1443		1443
PL	3490	1620	5110	2330	1075	3405
PT	1109	577	1686	715	388	1103
RO	1599		1599	1051		1051
SE	2475	174	2649	1826	141	1967
SI	3297	1326	4623	2228	933	3161
SK	1058		1058	657		657
Total	**56581**	**16015**	**72596**	**38907**	**11488**	**50395**

Data: SHARE Wave 9, Release version: 0

2.5 Sampling Variables in the Released SHARE Data

As usual, the SHARE Release 9.0.0 includes a generated module (*gv_weights*) with variables providing information on the sampling design in each country. Hence, the variable subsample identifies the various subsamples drawn in a specific country and wave of the SHARE panel sample, while the indicators *psu*, *ssu*, *stratum1 (PSU)* and *stratum2 (SSU)* provide information on stratification and clustering in each subsample. In addition, the *gv_housing* module contains regional information (so-called NUTS areas; Eurostat, 2022) on the interviewed respondents that are also part of the GST (see Bethmann et al., 2019 for further information). Table 2.3 provides an overview of these variables that are necessary to construct appropriate weights addressing problems of unit non-response and attrition (see Chapter 8 on weighting).

Table 2.3: Sampling Design Variables

Variable	Description	Unit of analysis
subsample	Subsamples within country	Household & individual
psu	Primary sampling unit	Household & individual
ssu	Secondary sampling unit	Household & individual
stratum1	First stratum	Household & individual
stratum2	Second stratum	Household & individual
nuts	Regional classification of unit	Household & individual

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deliverables*

CHAPTER 3

SHARE Corona Survey 2 Questionnaire Adaptations

03

3 SHARE CORONA SURVEY 2 QUESTIONNAIRE ADAPTATIONS

Yasemin Yilmaz, Elena Sommer, Barbara Thumann and Axel Börsch-Supan

3.1 General Framework

The SHARE Corona Surveys were part of a "before-during-after" data collection design in response to the COVID-19 pandemic (see Figure 3.1). The first two elements in this scheme were the regular SHARE Wave 8 face-to-face interview, whose fieldwork was interrupted due to the outbreak of the pandemic in March 2020, and the first SHARE Corona Survey (SCS1) that was conducted as a telephone survey (CATI). The second SHARE Corona Survey (SCS2) was designed as a follow-up telephone interview to SCS1, taking a longer-term perspective on the health effects, economic hardships, and social disruptions. SCS2 is the third element in this "before-during-after" design. The fourth and final element of this data collection design is the regular SHARE Wave 9 face-to-face interview.

Figure 3.1: Data Collection Scheme
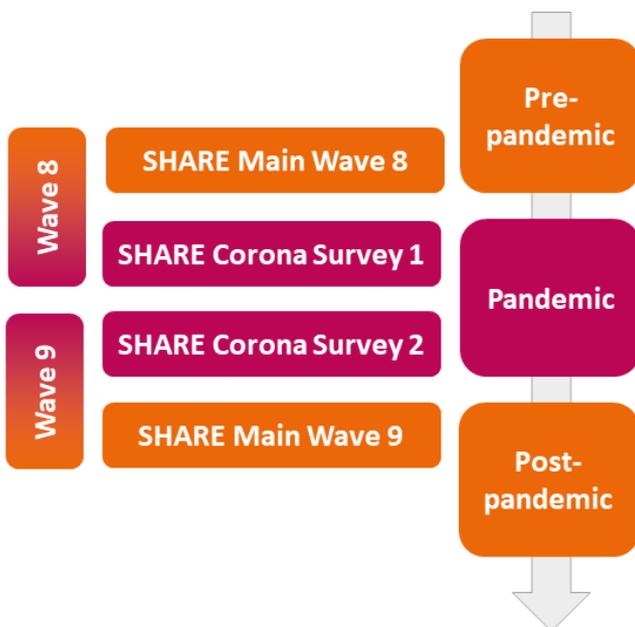
Given this framework, the main guiding principles for designing the SCS2 questionnaire were to keep changes between the two Corona Surveys to a minimum, in line with SHARE's panel design, while still updating the questionnaire content to ensure timeliness and relevance for data collection, and finally, to keep it simple and short. Since both SHARE Corona Surveys were administered as telephone interviews, the questionnaires aimed to keep the interview time under 30 minutes. In line with SHARE's broad schematization of its age groups (professionally active, young retirees, elderly aged), SCS2 keeps the same questionnaire sections as in SCS1, with relevant questions for each age group (for details, see Yilmaz et al., 2021). The aim of SCS2 is to update the information on the respondents' experiences in work, care, and social relations following a year of ups and downs, after the initial shock of the pandemic had subsided and most experienced a relatively free first summer of pandemic in 2020 only to return to repeated closures, lockdowns, and a more drawn-out pandemic response in the fall/winter of 2020-2021.

The SCS2 questionnaire is part of the longitudinal design of SHARE, so the data from the pandemic-specific questions can be enriched by existing information from previous waves, life histories, and also be complemented by the main data collection of Wave 9.

3.2 Contents

The questionnaire is structured around five main sections: 1) health (physical and mental) and health behaviour, 2) Corona-related infection, 3) quality of healthcare, 4) work and economic situation, and 5) social networks. The sections follow the same structure as the first SHARE Corona Survey (SCS1).

The most important adaptation in SCS2 concerns the time references in the questionnaire. As SCS1 was developed in response to a rapidly unfolding pandemic, the time frame was naturally set as "since the outbreak of Corona." For SCS2, this reference point needed to be adapted to avoid double-counting of events or giving respondents too long of a time horizon. In SCS2, questions without wording changes refer to the date of the SCS1 interview to cover the respondents' pandemic experience up until summer of 2021. Since SCS2 was designed as a panel interview, only those with an SCS1 interview were eligible to participate, however, new partners in households were still interviewed. For these respondents the reference point is "since July 2020", as this

is roughly the midpoint of the SCS1 fieldwork for all SHARE countries, except Austria. For questions that implied a comparison to the pre-pandemic times or the first wave of the pandemic, the SCS2 questionnaire refers to respondents' experience in the "last three months" before the SCS2 interview. Because the lived experiences of the pandemic varied greatly among the SHARE countries, making references to further "waves" after the first wave or specific months was not useful but "the last three months" has the benefit of being easy to understand and remember, and still captures a period of lockdowns and pandemic control measures across the countries. Furthermore, as the fieldwork period for both surveys was during the summer months, the three months reference mirrored the time span of SCS1 and captured respondents' experiences during the spring. Finally, several new questions in SCS2 still refer to "since the outbreak of Corona" as their reference (e.g., having travelled abroad).

In addition to the five main sections listed above, the SCS2 also features a subset of the SHARE housing questions, addressed to those who have moved since Wave 8. The pandemic prompted some people to change their place of residence, with some families moving back in with their parents or children and others leaving the city for the countryside. This subset of questions aims to capture changes in the respondents' living situations, by asking about the area, type of building, and the number of rooms available to household members. The data can be complemented by information from the Coverscreen on household members and their relationship to the respondent.

The health and health behaviour section are characterized by a high stability of questions. Most questions in this section are repeated from the SCS1 with an updated time references where applicable. The subsection on mental health, for example, follows a branch format asking whether the symptom mentioned in the question increased or decreased compared to the first phase of the pandemic. The SCS2 health section asks about general self-rated health, respondent's diagnoses and illnesses, limitation in daily activities and the respondent's medication use. In terms of health behaviour, an important section is devoted to respondent's behavioural adaptation to the preventative measures. Here some changes were needed to maintain the relevance of the questionnaire. For example, questions on wearing masks, washing hands, keeping distance, etc. were dropped due to the general widespread of these measures one year into the pandemic but a new question on the use of public transport was added. For the second year of the pandemic, we also asked about how many people on average the respondent had met when travelling abroad, as relaxations were introduced across the countries and populations slowly returned to their pre-pandemic socialization and travelling patterns. An important novelty in the questionnaire tracks the developments in the knowledge and the treatment of COVID-19.

These are reflected in new questions on preventative medicine and vaccinations. The question on getting a COVID-19 vaccine also asks respondents about their decidedness/hesitance in getting vaccinated, along with two vaccination questions from the regular SHARE interview regarding flu and pneumonia vaccines.

In terms of adaptations for COVID-19-related infection and exposure, the question on negative tests was cut as with increased availability of different kinds of tests, this question became difficult for respondents to answer accurately. However, new questions on the number of tests and associated costs were introduced to this section. Also, in accordance with emerging knowledge surrounding the illness, a question on long-COVID-19 was added.

As in SCS1, the quality of healthcare section asks respondents about any medical treatments they have foregone, postponed, or were denied. If they have received medical treatment, they were also asked about how satisfied they were and the reasons for their dissatisfaction. In SCS2, the main novelty for the quality of healthcare section is asking respondents about catching-up on these missed medical treatments or appointments. As the pandemic drags on, the longer-term implications of missed or postponed medical appointments are only beginning to surface. SCS2 aims to fill this gap by asking whether respondents have caught up with these treatments before their interview. Another addition to the healthcare section is a new question on tele-medicine, asking respondents how many medical consultations via telephone, computer, or other electronic means they had since the outbreak of the pandemic and whether this is more or less so than their pre-pandemic practices.

In the work section, respondents were asked again about their working situation at the time of the interview, whether they have become unemployed, furloughed, laid off, or had to close their business since the SCS1 interview, and if so, for how long. A novelty in this section concerns the retirees. If respondents retired after the outbreak of COVID-19, they were asked if the retirement was as planned, earlier, or later. The economic distress of the pandemic might have brought with it early retirement for some older workers in some of the disrupted sectors, but for others, particularly in the medical professions, the pandemic also meant a postponement of retirement plans. The work section also asks about workplaces, whether they are the home or elsewhere, perceived workplace safety, and changes in working hours. Additionally, a question on receiving financial support was moved to the end of the work section in SCS2, so that it could be asked of all respondents individually, rather than only of the financial respondent as in SCS1.

For household finances, a financial respondent answers on behalf of the household and this is set as the first respond-

ent to be interviewed. This section includes questions on household income, whether it has fluctuated or remained the same each month since the SCS1 interview. If the household income was lower at certain points, respondents are also asked to indicate which types of their income were lower than in a month before the COVID-19 crisis. In addition to questions on making ends meet, SCS2 also asks respondents about whether they had to postpone regular payments or dip into their savings since the SCS1 interview. Other novelties include an estimate of how many months the respondent thinks they can survive on their savings and a single question from the regular SHARE Wave 8 Savings Regret module, asking how the respondent thinks they would change their saving behaviour if they had the chance.

Finally, the questionnaire concludes with the questions on the respondents' social networks, asking about the frequency of personal contact with their family members and non-relatives, as well as contact via electronic means. The main novelty for the questions on physical contact is the inclusion of "grandchildren" as a category of contacts. While the SCS1 did not specify grandchildren as a separate category in the social networks questions, for SCS2 this was timely and interesting given the policy debates around school closures and intergenerational solidarity. Furthermore, the questionnaire also features questions on giving and receiving help and comparing the amount of given or received help to the first phase of the pandemic, providing personal care, receiving home care and whether the amount was adequate. In addition, given the increased use of the internet among older people since the outbreak of the COVID-19 pandemic, a question on various online activities was added at the end of the SCS2 questionnaire.

References

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CHAPTER 4

SHARE Wave 9 Questionnaire Adaptations with
a Special Focus on the End-of-Life Interview

04

4 SHARE WAVE 9 QUESTIONNAIRE ADAPTATIONS WITH A SPECIAL FOCUS ON THE END-OF-LIFE INTERVIEW

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The ninth wave of the regular SHARE interview holds few novelties regarding the questionnaire structure and its content. The decision to field a substantially unchanged questionnaire was driven by the necessity to minimize the workload while the second SHARE Corona Survey (SCS2) was under preparation. In line with the innovation made in Wave 8, the core questionnaire did not change its structure. The core modules were kept, while adjustments were implemented only if they were indispensable for the improvement of the data quality (e.g. wording changes to reduce ambiguity).

The Social Network (SN) module was administered for a fourth time. It widens the possibility of examining changes in the interpersonal environments of the SHARE respondents that occurred after a shorter period of time than previously done in SHARE. Having the SN module in a back-to-back wave cuts the time between the two data collections to two years while previously it was every four years (Wave 4 in 2011, Wave 6 in 2015, and Wave 8 in 2019).

The tests on cognitive functioning (CF), that were added in Wave 8, were also part of the Wave 9 questionnaire. The rationale to keep the CF add-on module was the need to collect a more recent measure of the cognitive abilities for the whole SHARE sample in relation to the in-depth measure performed by the Harmonized Cognitive Assessment Protocol (HCAP) survey on a subset of the sample (see Chapter 10 for more details).

Introduced as an add-on module in Wave 8, also the Time Expenditure (TE) module was administered in Wave 9. This will open manifold research options for the scientific community to make use of the panel dimension of the module. The module gathers data on how active respondents still are in comparison to the previous wave, how much they contribute to paid and unpaid work, and when important changes in their activity patterns occur.

The other two add-on modules introduced in Wave 8, Saving Regret (SR) and Accelerometer (AX) data collection, were not kept in Wave 9. The Saving Regret module was meant to be only fielded as an add-on module in Wave 8 and the Accelerometer data collection was linked to funds only available in Wave 8.

The End-of-Life interview has been adapted to account for the impact of the outbreak of the COVID-19 pandemic to the life of the SHARE respondents who passed away during the pandemic. A set of new questions was introduced to link the conditions of the death to the COVID-19 pandemic. These questions seek to identify which aspects of End-of-Life care such as hospital stays, care needs, or quality of help received were affected by the COVID-19 pandemic. The survey data collected by the End-of-Life interview offers various options to understand the impact of the pandemic on individuals and their families, their health and care situation, providing empirical evidence to inform policy makers. The rest of the chapter will address the innovations in the End-of-Life interview in more detail.

4.1 Corona-related Questions in the End-of-Life Interview: Motivation, Implementation, and Sample Composition

Measuring at which degree the global COVID-19 pandemic affected the demand for and the supply of care provides a better understanding of the direct and the indirect effects on the well-being of the SHARE participants and sheds light on the functioning of the health-care systems in the different European countries in highly stressful times.

The End-of-Life interview of the regular SHARE Wave 9 records COVID-19 disease as a possible cause of death and a reason for having to die alone because of the lockdown, irrespective of the cause of death. The new set of questions also covers multiple dimensions of healthcare utilisation and care supply. It ranges from the access to hospital and to hospice treatments to the availability of medications and personal paid care. It allows to assess the impact of the Corona outbreak and the related lockdown measures on the deceased SHARE End-of-Life participants as a function of housing conditions and living arrangements.

The End-of-Life interview accounts for 94 questions in Wave 9 (against 79 in Wave 8), of which 77 were left unchanged. One question deviates at least partly from previous waves, 16 questions are new and 2 questions from Wave 8 were

dropped. The median duration to answer the End-of-Life questionnaire was 12 minutes in the regular SHARE Wave 9, Release 0 data (Börsch-Supan, 2023).

The regular SHARE Wave 9 includes 3,442 observations with information on End-of-Life circumstances. For the analysis of this chapter, we focus on the SHARE 50+ participants who died during the years of the COVID-19 pandemic (2020-2021-2022), resulting in a final sample size of 2,687 interviews provided by the informants of the deceased respondents. The selected sample consists of 1,385 men and 1,302 women, with 40 percent of the deceased SHARE participants falling in the age range of 80-89 years. The mean age at the time of death is 81 years ($SD = 9.68$). Romania has the lowest mean age at death of 76 years ($SD = 9.27$), while Cyprus has the highest mean age at death of 86 years ($SD = 9.12$).

4.2 COVID-19-related Mortality in SHARE Countries

Accurate data on mortality due to COVID-19 is essential for informing public health policies and interventions, as well as for understanding the social and economic consequences of the pandemic on individuals and families. Moreover, it is important to identify COVID-19 as the cause of death to precisely measure the burden of the disease on different populations and to inform research on the epidemiology and risk factors associated with the disease (WHO, 2020).

COVID-19 has been added as a response option to the question about the main cause of death (question *xt011*). The respective response option also includes possible complications related to an infection with COVID-19. To make the new response option more salient to the interviewer, an interviewer instruction has been added.[4]

XT011_	What was the main cause of her death?
	Read out if necessary
	Note: COVID-19 or related complications have their own response option (9).
	1. Cancer
	2. A heart attack
	3. A stroke
	4. Other cardiovascular related illness such as heart failure, arrhythmia
	5. Respiratory disease
	6. Disease of the digestive system such as gastrointestinal ulcer, inflammatory bowel disease
	7. Severe infectious disease such as pneumonia, septicemia or flu
	8. Accident or suicide
	9. COVID-19 or related complications
	97. Other (Please specify)

The response option "COVID-19 or related complications" accounts for 14 percent of the causes of death for the deceased SHARE respondents in the sample. These proportions are remarkably low in Denmark and in Germany (1 percent and 3 percent, respectively) and at their highest in Greece and in Hungary (41 percent and 45 percent, respectively) – see Figure 4.1. The proportions are of the same magnitude with respect to men (14 percent) and women (15 percent). Table 4.1 reports that the proportions for the different age groups are of the same magnitude. For the age group 50-59, the statistic is not reliable due to the limited sample size.

The lack of reliable tests at the beginning of the outbreak could lead to some bias of self-reporting (under-reporting). Fedeli et al. (2022) stress the importance of an approach based on multiple causes of death to capture correctly competing causes. One way to address this concern would be to combine the proportions of the two response options (*5. Respiratory disease and 9. COVID-19 or related complications*) to get an upper bound for the figures.

Table 4.1 also reports the proportion for the response option *Respiratory disease* (4 percent). Among the deceased SHARE participants, those who aged 60-69 years have the lowest proportion (2 percent), while those who aged 90+ years have the highest proportion (5 percent). Looking at the aggregate figures, the results suggest that COVID-19 and respiratory disease could account for up to 18 percent of the causes of death.

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4   Few cases have been reported under response option "Other" that could be related to COVID-19. We do not combine them with the cases that report "COVID-19 or related complications". The results are substantially the same.

Table 4.1: Main Cause of Death by Age Group

Cause of death	Age group						
	50-59	60-69	70-79	80-89	90+	DK/Ref	Total
COVID-19 or related complications	8%	14%	14%	15%	14%	24%	14%
Respiratory disease	1%	2%	5%	3%	5%	0%	4%
Any other response options	91%	84%	81%	82%	81%	76%	82%
N	53	332	655	1065	545	37	2687

Data: SHARE Wave 9, Release version: 0
Note: "Any other response options" combines the response options 1-4, 6-8 and 97 of XT011.

Figure 4.1: Percentage of Deaths Due to COVID-19 by Country
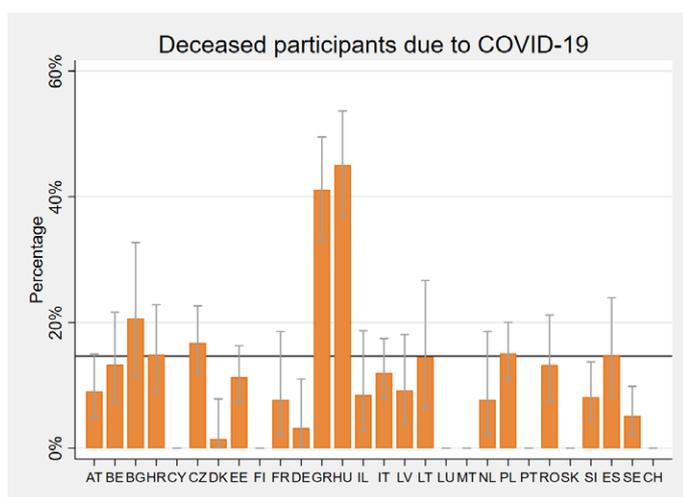
Data: SHARE Wave 9, Release version: 0
Note: Values for CY, FI, LU, MT, PT, SK and CH are not reported given that the number of deceased respondents for those countries is lower than 50 cases. N=2,687.

4.3 Conditions of Death during the COVID-19 Pandemic

The personal toll of the COVID-19 pandemic extends far beyond the medical symptoms. Knowing whether people died alone or not during the pandemic is essential for understanding the impact of this tragedy on individuals, on their families (Strang et al., 2020), on the care providers (Anderson-Shaw and Zar, 2020) and on our society.

The SHARE End-of-Life interview also records the location where the SHARE participant died (question *xt014*). The deceased SHARE participant's home was selected as the place of death for 864 cases (32 percent of the sample). In Wave 9, two follow-up questions (*xt123* and *xt124*) were introduced to record if the death occurred when the deceased SHARE participant was alone and if that was due to the restrictions imposed by the COVID-19 pandemic.

XT123_	Was there anyone else present when {Name of the deceased} passed away? Yes/No
XT124_	[if XT123 = No] Was this due to the outbreak of Corona? Yes/Partly/No

For the group of deceased SHARE participants who died at their own home, no one was present for 29.6 percent of the cases, i.e., about 9.5 percent of all deceased SHARE participants died alone at their home. COVID-19 pandemic was responsible for only 7 percent and partly responsible for 6 percent of those cases, i.e. about 1 percent of all deceased SHARE participants died alone due to the COVID-19 pandemic.

The pandemic has led to lockdowns across Europe being imposed to restrain the spread of COVID-19. The restrictions have varied in severity and timeline, with some countries imposing stricter rules than others and some enforcing lockdowns earlier than others (ECDC, 2022). To learn about the restrictions for deceased SHARE participants' funerals, question *xt136* was introduced.

XT136_	We would also like to ask you how the outbreak of corona might have affected the funeral for {Name of the deceased}. Did you or other relatives of {Name of the deceased} face any restrictions for the funeral because of the outbreak of corona? Yes/No

For 41 percent of the deceased SHARE participants' funerals, there were some restrictions due to the COVID-19 pandemic. The levels of restrictions on funeral services vary significantly among the countries in the sample. These proportions

are remarkably low in Romania and in Israel (14 percent and 20 percent, respectively) and at their highest in Greece (77 percent) – see Figure 4.2.

Figure 4.2: Percentage of Deceased SHARE Participants' Funerals with Restrictions Due to the COVID-19 Pandemic by Country
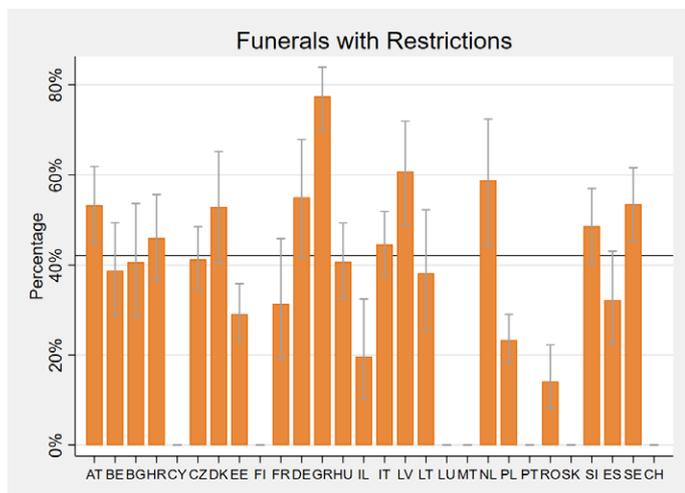
Data: SHARE Wave 9, Release version: 0
Note: Values for CY, FI, LU, MT, PT, SK and CH are not reported given that the number of deceased respondents for those countries is lower than 50 cases. N=2,687.

The proportion of funerals with restrictions varies over time and reflects the introduction of lockdown measures in the different countries and the different seasons. As shown in Figure 4.3, the percentage of funerals with restrictions sharply increased in the beginning of 2020, when many countries started to impose harsh lockdown measures. A steep decline of funeral restrictions occurred in June 2020, but the proportion went up again in the following months. The findings are largely consistent with the wide-scale lockdown measures implemented in European countries and the seasonal pattern of the COVID-19 infections observed in Europe (Wiemken et al., 2022).

Figure 4.3: Percentage of Deceased SHARE Participants' Funerals with Restrictions Due to COVID-19 over Time
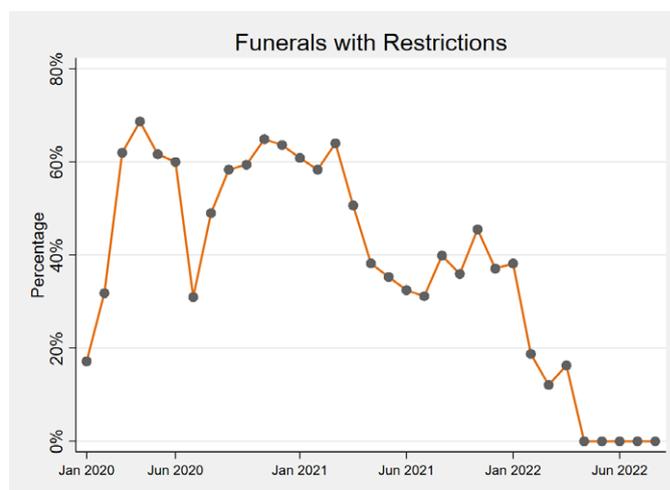
Data: SHARE Wave 9, Release version: 0
Note: N=2,592. All countries.

A follow-up question (*xt137*) investigates further the type of restrictions imposed on the funerals.

XT137_	What kind of restrictions were these? Read out. Code all that apply. 1. A funeral was not allowed. 2. There was a limit on the number of people who could attend. 3. Family or friends could not attend because of travel restrictions. 4. Social distancing measures, such as hugging, shaking hands… 5. Restrictions on family's choices, such as burial or funeral site. 97. Other (please specify)

Restrictions were binding for 41 percent of the deceased SHARE participants. The funeral could not take place (5 percent) or with only a limited number of people (81 percent). Participation of the family or friends was also affected, i.e., there were travel restrictions (19 percent) or social distancing measures (52 percent) in place. Restrictions also affected families' choices such as burial or funeral site (9 percent).

4.4 The Situation of the Healthcare System during the COVID-19 Pandemic

The measurement of unmet healthcare needs is a valid indicator of the difficulties in accessing healthcare services. Waiting time, distance or transport, financial reasons are usually indicated as the main reasons for which health care need could not be met (OECD, 2020).

During the COVID-19 pandemic, hospital congestion and intensive care unit (ICU) occupancy rates in Europe reached critical levels. Hospitals struggled to cope with the increased demand for services, leading to longer waiting times and overcrowding (WHO, 2022). This is especially true in ICUs, where occupancy rates had been well over 100 percent in some countries, leading to the rationing of care (Berger et al., 2022).

In Wave 9, the End-of-Life interview assesses how the pandemic impacted the access to routine medical services and preventive care. As in previous waves, the End-of-Life questionnaire covers the availability of routine medical services and preventive care such as hospitals, hospices, and nursing homes. Furthermore, this section of the questionnaire provides a novel and microscopic insight into the quality of personal care that individuals received, including matters such as bathing, dressing, and changing bedding, as well as the kindness, attention, and care offered by healthcare professionals.

In Wave 9, more detailed questions were introduced to account for the impact of the COVID-19 pandemic on the unmet healthcare needs, as well as medical care that was avoided due to the fear of infection. Specific measures were added to the questionnaire to account for provided breathing assistance, and the amount of medication offered for pain. Both aggregate and country level data are presented below.

Two new questions introduced in Wave 9 investigate whether the COVID-19 pandemic affected the availability and the accessibility of healthcare in the last period of life of the deceased SHARE participant. Question *xt125* was added to the End-of-Life interview to capture when the need of staying at a health-care facility was not satisfied due to the COVID-19 pandemic. Question *xt126* asks if the participant did forgo some medical treatment or operation to avoid the risk of being infected by COVID-19.

XT125_	In the last year before she died, did {Name of the deceased} ever need to stay in a hospital, hospice or nursing home and **could not** because of the outbreak of corona? Yes/No
XT126_	In the last year before she died, did {Name of the deceased} forgo any medical treatment or operation, because she was afraid to become infected by the coronavirus? Yes/No

Despite the increased burden on the European healthcare systems, only 7 percent of the sample could not get the healthcare needed. This percentage is not significantly different between men and women. Table 4.2 reports a slightly higher proportion of participants with denied need for the younger class of age. These proportions are remarkably low in the Netherlands and in Romania (0 percent and 2 percent, respectively) and at their highest in Latvia and in Lithuania (13 percent and 15 percent, respectively) – see Figure 4.4.

Table 4.2: Percentage of Deceased SHARE Participants with No Stay in Hospital, Hospice or Nursing Home Due to the COVID-19 Pandemic by Age Group

Could not stay in hospital, hospice or nursing home due to COVID-19	Age group						Total
	50-59	60-69	70-79	80-89	90+	DK/Ref	Total
Yes	6%	9%	7%	7%	5%	13%	7%
No	87%	89%	92%	92%	93%	68%	91%
Don't know	7%	2%	1%	1%	2%	19%	2%
Refusal	0%	0%	0%	0%	0%	0%	0%
N	53	332	655	1065	545	37	2687

Data: SHARE Wave 9, Release version: 0

Figure 4.4: Percentage of Deceased SHARE Participants with Denied Hospital Stay Due to the COVID-19 Pandemic in the Last Year of Life by Country
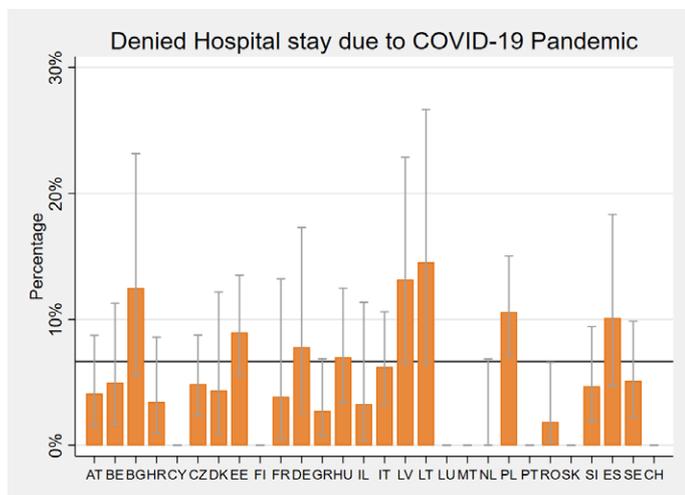
Data: SHARE Wave 9, Release version: 0
Note: Values for CY, FI, LU, MT, PT, SK and CH are not reported given that the number of deceased respondents for those countries is lower than 50 cases. N=2,687.

The reduced offer of healthcare provided directly at the healthcare facilities is only one reason for which the deceased SHARE participant could not have received any medical treatment. Another reason is related to the perception of the risk to become infected by COVID-19 at the healthcare facility. The perception of the risk was relatively low, only 3 percent of the sample did forgo some medical treatment (Table 4.3). This percentage is not significantly different between men and women. Table 4.3 reports a slightly higher proportion of deceased SHARE participants who did forgo treatment for the younger class of age. These proportions are remarkably low in Sweden (1 percent) and at their highest in Bulgaria and in Greece (9 percent and 12 percent, respectively) – see Figure 4.5.

Table 4.3: Percentage of Deceased SHARE Participants Who Did Forgo Medical Treatment Due to the Fear of Becoming Infected by COVID-19 and Age Group

Foregone medical treatment due to fear of becoming infected by COVID-19	Age group						
	50-59	60-69	70-79	80-89	90+	DK/Ref	Total
Yes	2%	7%	4%	3%	2%	3%	2%
No	91%	89%	93%	95%	95%	93%	95%
Don't know	7%	4%	2%	2%	3%	3%	3%
Refusal	0%	0%	1%	0%	0%	0%	0%
N	53	332	655	1065	545	37	2687

Data: SHARE Wave 9, Release version: 0

Figure 4.5: Percentage of Deceased SHARE Participants Who Did Forgo Medical Treatment Due to Fear of Becoming Infected by COVID-19 by Country
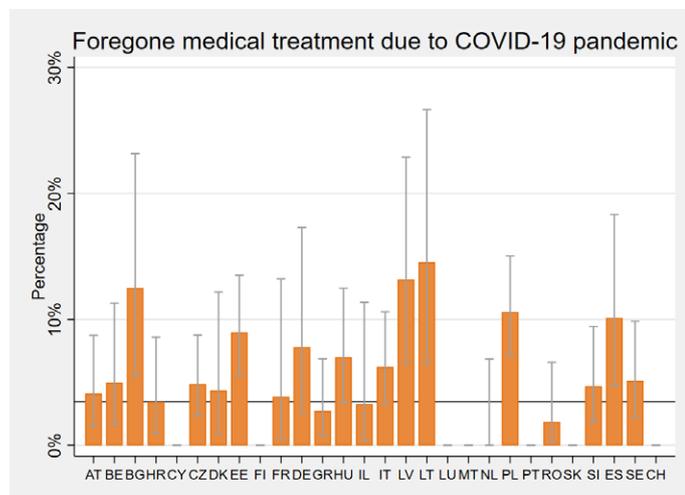
Data: SHARE Wave 9, Release version: 0
Note: Values for CY, ES, FI, LU, MT, PT, SK and CH are not reported given that the number of deceased respondents for those countries is lower than 50 cases. N=2,687.

The End-of-Life interview also records whether the deceased SHARE participant has received hospice care (or other form of palliative care) in the last four weeks of his/her life. For those participants who did not receive any, a follow-up question asks about the reason. It distinguishes between care that was not needed or not wanted versus the cases when the care was needed or wanted but not available or too expensive. In Wave 9, the new question *xt127* relates the reason to the outbreak of the pandemic.[5] The number of deceased SHARE participants who did not receive any hospice care is 1942 (72 percent of all the deceased SHARE participants).

The group of people who did not receive any hospice care can be divided in two groups, a group (A) for whom any hospice care was neither needed nor wanted – 1789 deceased SHARE respondents – and another group (B) for whom it was needed or wanted – 123 deceased SHARE respondents.[6] In group A, 85 percent reported that not receiving hospice care and not needing/wanting it was independent from the COVID-19 pandemic. Another 7 percent (7 percent) of the group A reported that hospice care was not received (partly) due to the COVID-19 pandemic. It is unknown for 1 percent of group A. These figures are similar to the percentage of

deceased SHARE participants who did forego medical treatment due to the fear of being infected.

Looking at group B, for 56 percent of those who did not receive any hospice care even if it was needed or wanted, it was independent from the COVID-19 pandemic. Furthermore, 19 percent (23 percent) of group B reported that hospice care was not received (partly) due to the COVID-19 pandemic. It is unknown for 2 percent of group B.

In addition, two other types of healthcare need, which are easier to satisfy than receiving hospice care, are investigated in the questionnaire. The amount of medication for pain (*xt759*) and of help in dealing with breathing troubles (*xt761*) is self-reported in relation to the amount needed. When the deceased SHARE participant received too little medication for pain or too little help in dealing with breathing troubles, two new questions (*xt128* and *xt129*) recorded if receiving too little medication or too little help was due to the situation generated by the COVID-19 pandemic.[7]

Only 116 of the deceased SHARE participants received too little medication for pain and it was related or partly related to the COVID-19 pandemic for 21 percent of the cases. Similar outcomes were obtained for received help in dealing with breathing troubles. Only 114 of the deceased SHARE participants received too little help and it was related or partly related to the COVID-19 pandemic for 40 percent of the cases. Although for people with underlying health conditions, the need for pain medications and breathing support was even more critical, the subsamples for these two categories are small and thus inconclusive for further analysis.

Widening the focus on personal care needs that include bathing, dressing, and changing bedding, question *xt764* asks how often these personal care needs were taken care of as well as they should have been. For most deceased SHARE participants (73 percent) it was reported that personal care needs were always (or usually) met while personal care was sometimes (never) met for 7 percent (4 percent) of the cases. In addition, 13 percent of the cases reported that help was not needed or wanted. The new question *xt130* follows up asking if there has been too little personal care (partly) due to the COVID-19 pandemic.[8]

For the deceased SHARE participants with personal care needs met sometimes, the COVID-19 pandemic accounts for 29 percent of the cases. For the SHARE participants with no

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5   See SHARE End-of-Life questionnaire for a complete description of the set of questions: *xt756_, xt757_, xt754_* and *xt127_* (https://share-eric.eu/data/data-documentation/questionnaires/wave-9).
6   For the remaining 30 deceased SHARE participants, it was not known if they needed or wanted any hospice care.
7   See SHARE End-of-Life questionnaire for a complete description of the set of questions: *XT758_, XT759_, xt128_ and XT760_, XT761_, xt129_* (https://share-eric.eu/data/data-documentation/questionnaires/wave-9).
8   See SHARE End-of-Life questionnaire for a complete description of the set of questions: *xt764_* and *xt130_* (https://share-eric.eu/data/data-documentation/questionnaires/wave-9).

personal care needs met, the COVID-19 pandemic accounts only for 7 percent of the cases. The same proportion (7 percent) was obtained for those who did not want or need any help. The subsamples are small and thus inconclusive for further analysis.

Knowing the behaviour of the staff who took care of the SHARE respondents before they deceased is important to determine the quality of care received. Question *xt765* identifies when there was no staff who took care of the deceased SHARE participant.[9] It amounts to 21 percent of the deceased SHARE participants and COVID-19 accounts only for 8 percent of those cases (*xt131*). The subsamples are small and thus inconclusive for analysis.

Question *xt765* also identifies the quality of the care received by professional staff asking how often the staff was kind, caring and respectful. For those deceased SHARE participants who received care from professional staff, a follow up question (*xt766*) asks the proxy respondent to rate the quality of care received by the deceased SHARE participant in his/her last month of life. Possible response options are *Excellent, Very good, Good, Fair,* and *Poor.* Assuming equally distant values for the five response options, it is possible to compute the quality score of the care received (Excellent = 5, Very good = 4, Good = 3, Fair = 2, Poor = 1). The new question *xt132* asks to what extent the reported quality of care was affected by the COVID-19 pandemic.[10]

Table 4.4 reports that there was no impact on received care for 56 percent of the deceased SHARE participants who received professional care, while for 14 percent of the cases the quality of care suffered a lot due to issues related to the COVID-19 pandemic. The quality of care suffered to some extent also for 26 percent of the cases. Table 4.4 also reports a lower average quality score of care received from staff for the deceased SHARE participants who were more affected by the pandemic, suggesting that COVID-19 affected negatively the received care. Both means of the first two groups (3.35 and 3.61), are statistically different from the mean of the third group (4.00).

Table 4.4: Impact of the COVID-19 Pandemic on Care Quality

Impact of COVID-19 pandemic on care		Self-reported score of care quality received from staff	
	Freq.	Mean	SD
A lot	14%	3.35	1.14
Somewhat	26%	3.61	0.92
Not at all	56%	4.00	0.98
Don't know	4%	n.a.	n.a.
Refusal	0%	n.a.	n.a.

Data: SHARE Wave 9, Release version: 0
Note: Column "Freq." displays the percentage of the observations. The third (forth) column reports the average score (standard deviation) of care quality from staff received by deceased SHARE participants under different impact of COVID-19 on care. The sub-sample contains only those participants who received care from professional staff and reported a score for care quality (N = 2061). When the number of observations by sub-sample is lower than 50, the statistic is not reported and "n.a." is displayed.

Looking at informal help received by the deceased SHARE participants, the End-of-Life interview asks about a set of activities (ADL) for which the participant had difficulties due to physical, mental, emotional or memory problems in the last 12 months of life. A follow up question (*xt022*) was asked to those with problems in the ADL list (1888 individuals) if anyone was available to provide help.

XT134_	At any other point in the last twelve months of her life, did {Name of the deceased} need help and was **unable** to receive it, because of the outbreak of corona? Yes/No
XT135_	For how many weeks was {Name of the deceased} unable to receive help? Count 1 for part of one week.

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9   See SHARE End-of-Life questionnaire for a complete description of the set of questions: *xt765_* and *xt131_* (https://share-eric.eu/data/data-documentation/questionnaires/wave-9).
10   See SHARE End-of-Life questionnaire for a complete description of the set of questions: *xt765_, xt766_* and *xt132_* (https://share-eric.eu/data/data-documentation/questionnaires/wave-9).

Only 120 deceased SHARE respondents did not have anyone to help with ADL and for only 22 percent of them the COVID-19 pandemic was responsible for the lack of help (question *xt133*: "Was this due to the outbreak of corona?"). For the deceased SHARE participants who received some help with ADL (1761 individuals), a new follow up question (*xt134*) asks about any interruption in receiving help due to COVID-19 pandemic. Only 5 percent of those who experienced an interruption in receiving help were unable to receive help with ADL when needed for a median period of 6 weeks (*xt135*).[11] The subsamples are small and thus inconclusive for further analysis.

4.5   Concluding Remarks

The regular SHARE Wave 9 survey offers a unique opportunity to gain insight into the healthcare and well-being of elderly populations in Europe – a group that was also disproportionately affected by the COVID-19 pandemic. The stability of the panel questionnaire and the repetition of modules introduced in Wave 8 will allow researchers to investigate patterns in the changes that occurred between the pre-pandemic period and the tail of the pandemic for topics related to social network, cognitive functioning, and time expenditure, on top of the standard topics addressed in the regular SHARE questionnaire.

The innovations made in the End-of-Life interview will allow researchers to associate the access to hospital care, the unmet medical needs, and the quality of care from healthcare staff in the times of the ongoing COVID-19 pandemic. The new set of questions provides a detailed overview of the last period of individuals' lives by asking questions such as presence of close family members in the last days, quality and frequency of personal care in relation to the pandemic, and conditions of funerals.

The results suggest that COVID-19 and respiratory disease could account for almost one fifth of the causes of death in the sample. The restrictions related to the lockdown measures affected substantially the participation in the funerals and marginally the personal visits during the last days of the deceased. Despite the increased burden on the European healthcare systems, the survey findings indicate that individuals were able to have access to the healthcare facilities, although a small proportion reported to have foregone medical treatment or hospice care due to contagion-related fear. The data also showed that the type of care provided by professional staff was also negatively affected by the pandemic. However, further research with a larger sample could address better the causes of the change in care quality received.

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11   See SHARE End-of-Life questionnaire for a complete description of the set of questions: *xt022_, xt133_, xt134_* and *xt135_* (https://share-eric.eu/data/data-documentation/questionnaires/wave-9).

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CHAPTER 5

Software Innovations in SHARE Wave 9
– Multimode Implementation and Beyond

05

5 SOFTWARE INNOVATIONS IN SHARE WAVE 9 – MULTIMODE IMPLEMENTATION AND BEYOND

Karin Schuller, Magdalena Hecher, Jeny Tony Philip and Iggy van der Wielen

5.1 Introduction: Conducting Fieldwork with Multimode Tools

SHARE Wave 9 consisted of two phases, the second round of the SHARE Corona Telephone Survey (SCS2; phase 1) and the regular SHARE face-to-face interview (phase 2). Data collection in those two modes within a short timeframe was achieved by developing, testing and fielding a multimode survey tool which functioned in two modes by enabling separate questionnaires for telephone and face-to-face interviews.

Work on the multimode adaptations for Wave 9 began in late 2020. The migration of both, the Sample CTRL (the tool used by agencies to manage fieldwork) as well as the Case CTRL (the tool which is used by the interviewers) to more advanced platforms using a web architecture instead of a client solution in Wave 8 had facilitated the transition from face-to-face to a telephone interview when the pandemic necessitated the shift. This move to a different mode concept set the first blueprint for the multimode survey in Wave 9. This included the functionality in the Sample CTRL to enable the agency to switch from CATI (Computer-Assisted Telephone Interview) mode to CAPI (Computer-Assisted Personal Interview) mode and vice versa.

5.2 Conceptualization

The multimode interview software was designed to allow for seamless mode switching from the telephone (phase 1) to the in-person (phase 2) mode. Thus, there was no need for a separate preload or patch in between these phases (see de Bruijne et al. 2021). A single set of preload variables is provided in the survey software at the very beginning which can be used for both phases, thus reducing duplication of effort and wastage of time. These preload variables, in addition to the variables which are needed every wave (basic demographic information from the gross sample, information on the household composition, eligibility status, and selected content information, which come from a previous wave of data collection as well as information on wave and/or country specific modules), included information on whether a household should participate in phase 1 or not. Once the switch in the Sample CTRL is implemented, the change in mode is synchronized to the Case CTRL, the software on the interviewer laptops, which then allows to switch to the correct mode (with the right interviewer interface). Thereafter, interviews can be conducted in the correct mode, depending on whether it is the SCS2 or the regular SHARE Wave 9 fieldwork. Harmonization of this switch between modes across the various SHARE countries was ensured by encrypting the switch functionality so that it can only be set in motion by the survey agency at the exact time designated for the switch. An additional feature of the Wave 9 software is that it includes an automated functionality to implement requests from respondents to delete data and/or contact information.

5.3 Implementation

Figure 5.1 shows the system architecture of all software components for the two phases of SHARE Wave 9. While the face-to-face CAPI interview and the Case CTRL were based on Blaise programming, the telephone interview used Quest. For this purpose, the Quest software was further developed for offline use. This will help future development for building and deploying new versions of the questionnaire. The software will be able to download and parse the questionnaire at runtime instead of a compiled version during installation. In contrast to the CAPI and Case CTRL data, which were synchronised with the Sample CTRL first before being send to the Central server, the CATI interviews in Quest were directly synchronized to the Quest server. The advantage of Quest is a much easier possibility to extract the data which helped checking the data for consistency and to monitor fieldwork on a daily updated view of the current state of fieldwork instead of the biweekly routine used for the CAPI data.

Figure 5.1: System Architecture of All Software Components
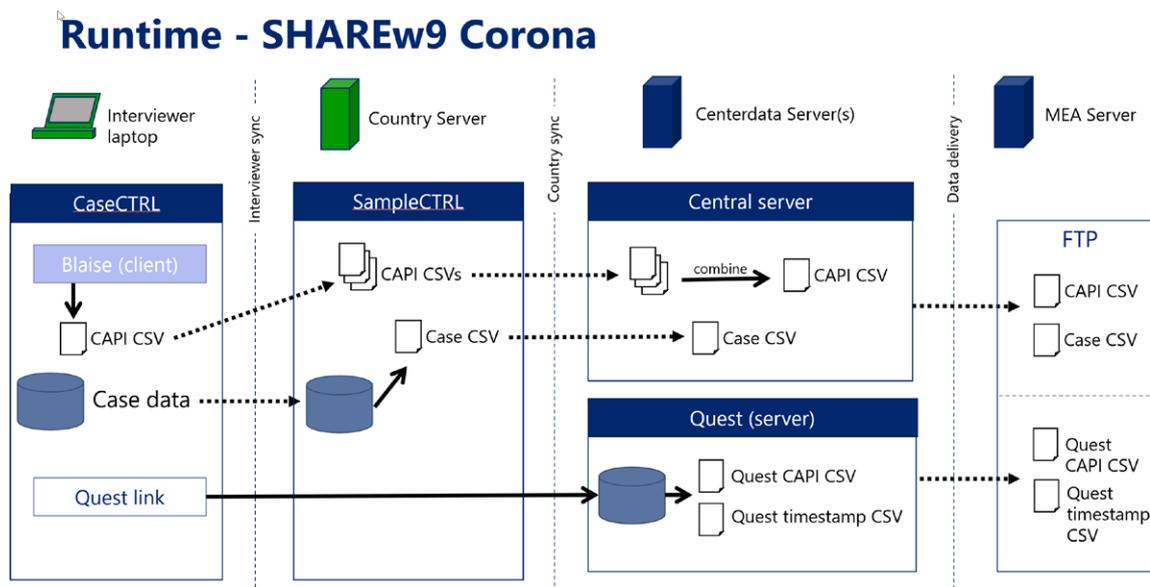
In Figure 5.2 you can see the household overview page of the Sample CTRL and the button to switch from one mode into the other (in this case the current mode is CAPI and it can be switched to CATI). When clicking on the switch button, a pop-up appears to ask for the correct password, which was provided to survey agencies only when SCS2 fieldwork was over.

Figure 5.2: Switch Button in Sample CTRL
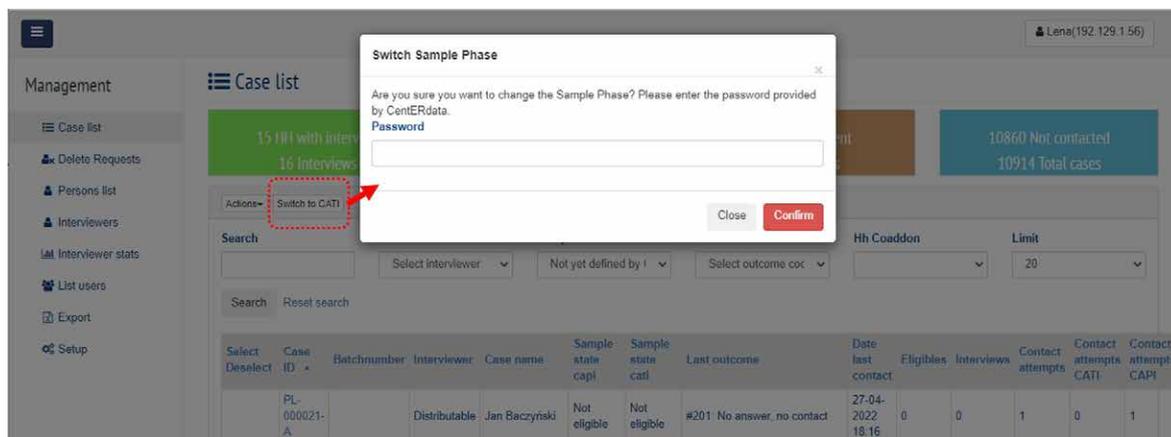
Figure 5.3 depicts again the household overview page of the Sample CTRL. To distinguish which households should participate in the CATI fieldwork phase, the variable hh_coaddon (yes/no) was established and added to the filters and as an additional column to the household list for the survey agencies to be informed.

Figure 5.3: hh_coaddon Variable in Sample CTRL to Identify Participating Households in the SHARE Corona Survey 2

Figure 5.4 and Figure 5.5 show the Case CTRL in the two different modes. In SCS2 after completing the Coverscreen interview, for eligible household members the "Start interview (COVID-19)" button to start the CATI interview was enabled (Figure 5.4), whereas in phase 2 the "Start interview" button for the CAPI interview was enabled (Figure 5.5). In both phases for eligible deceased persons the "End of life" button was enabled after the Coverscreen.

Figure 5.4: Case CTRL in SCS2 with Enabled SHARE Corona Survey

Figure 5.5: Case CTRL in SHARE Main Wave 9 with Enabled SHARE Main Survey

5.4 Training and Deployment of the Multimode Tool

After the development of the generic instruments, the field rehearsal, questionnaire adaptations and translations, and the development of national versions, the SCS2 was conducted using the multimode tool from June till September 2021. Once the SCS2 was concluded and the data extraction process completed, the survey tools were subsequently switched to the face-to-face CAPI mode in September 2021. These tools were now in position to be used to conduct the regular SHARE Wave 9 face-to-face interview. Starting with the Train-the-Trainer (TTT) sessions in October 2021 and several National Training Sessions (NTS) thereafter, the regular SHARE Wave 9 fieldwork started in October 2021 and continued until summer 2022 (see Chapter 6).

5.5 Technical Challenges

There were several technical challenges to the multimode implementation, namely:

- Challenges in ensuring all countries were finished with the first (CATI) phase before switching to the second (CAPI) phase
- Challenges with respect to transfer Coverscreen information from one mode to the other
- Challenges in coordinating changes in eligibility across modes
- Challenges in Sample CTRL synchronization
- Preventing version mix-ups across modes
- Training challenges
- Defining sample states and transitions across modes

5.6 Concluding Remarks

The implementation of fieldwork in different modes of data collection was originally not intended at this stage and was largely driven by the challenges outside of our control, but it accelerated progress to implement various concepts. For instance, new possibilities to reduce the time to field were discovered. The experiences with a multimode design enabled us to experiment with possibilities and understand the challenges associated with future multimode options for SHARE. It opened new perspectives on data collection and plans for further development of multimode options are currently considered. Moving to more centralised tooling will help managing the challenges found during the data collection of Wave 9. It will facilitate monitoring and give an up-to-date overview of fieldwork. Managing phases will be considered to be done centrally instead of coordinating it within all countries. An always available Case CTL and Sample CTRL could prevent version mix-ups and allow flexible sampling and eligibility across modes. Wave 9 was a great learning in the direction of multimode, but bigger challenges are yet to come.

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CHAPTER 6

Fieldwork Monitoring and Survey Participation
in SHARE Wave 9 (CATI & CAPI)

06

6 FIELDWORK MONITORING AND SURVEY PARTICIPATION IN SHARE WAVE 9 (CATI & CAPI)

Jeny Tony Philip, Karin Schuller, Magdalena Hecher and Gregor Sand

6.1 Introduction

The following chapter gives an overview about fieldwork monitoring in SHARE with all numbers and statistics adapted to the countries of the SHARE Wave 9 fieldwork. SHARE Wave 9 consisted of two parts, the second round of the SHARE Corona Survey (SCS2) and the regular CAPI survey (regular SHARE Wave 9). The outcome of both parts is described in the following chapter. The conceptual basis of monitoring in SHARE was developed in the run-up to Wave 5 and is outlined in Kneip et al. (2015). As usual, all indicators were conceptualised in strict accordance with the 10th edition of standards set by the American Association for Public Opinion Research (AAPOR, 2023). The advantage of this approach is that, at any point in time, we can report what the response and retention rates[12] would be if fieldwork was terminated at that instant. As in previous waves, our priority is ensuring data quality while putting the emphasis on all the major components of the Total Sampling Error, as described in Kneip et al. (2015).

In Wave 9, we also compiled the SHARE "Compliance Profiles" (i.e., one of SHARE's Key Performance Indicators (KPI)). This document, available on the SHARE website, is a short evaluation report of all operational tasks in the participating countries. It usually contains a set of quality control indicators regarding the development of fieldwork, interviewer trainings, data transfers, and the final response and retention rates. All participating countries are evaluated on these indicators uniformly.

Overall, all participating countries submitted the required input documentation and deliverables for the regular Wave 9 and for the SCS2. These deliverables include the refreshment sample and panel gross sample data, National Training Session (NTS) dates, NTS observation protocol, NTS slides, interviewer roster, advance letters, completed Survey Agency Feedback Form (SAFF).

6.2 Fieldwork Periods in Wave 9 (CATI & CAPI) and Survey Agencies

Figure 6.1 shows that fieldwork of the SCS2 took place largely synchronously between June and beginning of August 2021, just as originally planned. In countries with a red square only, the National Training Session and the first interview took place in the same week.

Figure 6.1: Fieldwork Periods of the SHARE Corona Survey 2

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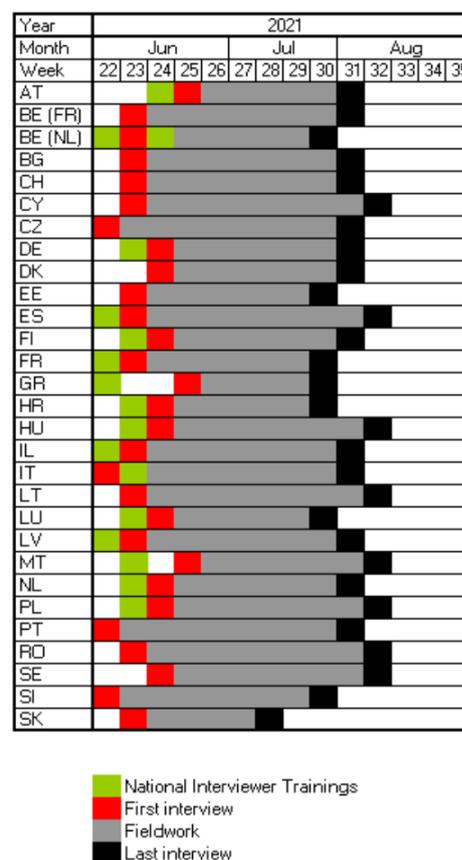
12 In the following, we differentiate between the two terms "response" and "retention". We refer to response rates whenever we look at the first response of a unit (household or individual) in a baseline or refreshment sample, while we refer to retention rates when we analyse response behaviour in the longitudinal sample.

As the first face-to-face SHARE survey to be conducted in the wake of the still existent COVID-19 pandemic, the circumstances in regular SHARE Wave 9 were extraordinary. It was anticipated that, as in Wave 8, fieldwork of the regular SHARE Wave 9 might have to be suspended after fieldwork had started. The solution was to take a country-by-country approach to this. Some countries delayed the start of fieldwork due to pandemic-related concerns affecting interviewers and/or respondents. Others had to briefly suspend fieldwork in the interim to adapt to developments related to the ongoing pandemic. Work on refreshment samples was especially affected by the pandemic, as winning the trust of new respondents in the refreshment sample became challenging. Countries followed various strategies to address this with varying degrees of success based on specific situations.

Figure 6.2 shows that the majority of Wave 9 (Wave 9 CAPI) countries were able to put the originally planned schedule into action. The start of fieldwork of regular Wave 9 happened largely synchronously across countries between October and the beginning of December 2021. In some countries, additional interviewer trainings were necessary (green squares), especially in cases where the start of the refreshment sample was delayed, such as in Germany. Notable exceptions were Croatia and Poland, which show substantial delays between national interviewer trainings and delivering the first interview. The suspension of fieldwork due to a renewed increase in COVID-19 infections occurred between week 49 in 2021 and week 5 in 2022 in the Netherlands, Spain, Belgium (FR) and Switzerland. Since Portugal and Finland had issues with securing funding on time, the start of their fieldwork was delayed compared to other countries. For Latvia, Austria and Israel the pandemic was the main delaying factor.

Figure 6.2: Fieldwork Periods of SHARE Main Wave 9

Table 6.1 shows the organisations that conducted fieldwork in each listed wave. There has been high stability of contracted survey agencies over time in most countries.

Table 6.1: Survey Agencies from Wave 1 to Wave 9 of Countries Participating in SHARE

	Wave 1	Wave 2	Wave 3	Wave 4	Wave 5	Wave 6	Wave 7	Wave 8/ SCS1	Wave9/ SCS2
AT	IMAS	IMAS	IFES	IFES	IFES	IFES	IFES	IFES	IFES
BE-FR	PSBH, Liège Univ.	PSBH, Liège Univ.	PSBH, Liège Univ.	PSBH, Liège Univ.	CELLO - Antwerp Univ.	CELLO - Antwerp Univ.	CELLO - Antwerp Univ.	CELLO - Antwerp Univ.	CELLO – Antwerp Univ.
BE-NL	PSBH Antwerp Univ.	PSBH Antwerp Univ.	CELLO - Antwerp Univ.	CELLO - Antwerp Univ.	CELLO - Antwerp Univ.	CELLO - Antwerp Univ.	CELLO - Antwerp Univ.	CELLO - Antwerp Univ.	CELLO – Antwerp Univ.
BG	-	-	-	-	-	-	GfK Bulgaria	GfK Bulgaria	Global Metrics Bulgaria
CH	MIS Trend	LINK	LINK	LINK	LINK	LINK	LINK	LINK	LINK
CY	-	-	-	-	-	-	RAI Consultants	RAI Consultants	RAI Consultants
CZ	-	SC&C	SC&C	SC&C	SC&C	SC&C	SC&C	SC&C	SC&C
DE	infas GmbH	infas GmbH	infas GmbH	infas GmbH	TNS Infratest	TNS Infratest	TNS Infratest	Kantar Public	Kantar Public
DK	SFI-Survey	SFI-Survey	SFI-Survey	SFI-Survey	SFI-Survey	SFI-Survey	DST Survey	DST Survey	DST Survey
EE	-	-	-	Statistics Estonia	GfK	Statistics Estonia	Statistics Estonia	Statistics Estonia	Statistics Estonia
EG	TNS Demoscopia	TNS Demoscopia	TNS Demoscopia	TNS Demoscopia	TNS Demoscopia	TNS Demoscopia	TNS Demoscopia	Ipsos Iberia	Ipsos Iberia
ES	TNS Demoscopia	TNS Demoscopia	TNS Demoscopia	TNS Demoscopia	TNS Demoscopia	TNS Demoscopia	TNS Demoscopia	Kantar TNS	Kantar TNS
FI	-	-	-	-	-	-	Taloustutkimus	Taloustutkimus	Taloustutkimus
FR	INSEE	INSEE	INSEE	INSEE (panel)/ GFK-ISL (refresh.)	GFK-ISL	TNS-SOFRES	TNS SOFRES	TNS SOFRES	Kantar Public
GR	Kapa Research	Kapa Research	Kapa Research	-	-	Kapa Research	Kapa Research	Kapa Research	Kapa Research
HR	-	-	-	-	-	GfK	GfK	IPSOS d.o.o.	IPSOS d.o.o.
HU	-	-	-	TÁRKI Social Research Institute	-	-	TÁRKI Social Research Institute	TÁRKI Social Research Institute	TÁRKI Social Research Institute
IL	Cohen Institute, Tel Aviv Univ.	Cohen Institute, Tel Aviv Univ.	-	-	Cohen Institute, Tel Aviv Univ.	Cohen Institute, Tel Aviv Univ.	Cohen Institute, Tel Aviv Univ.	Cohen Institute, Tel Aviv Univ.	Cohen Institute, Tel Aviv Univ.
IT	DOXA S.p.A.	DOXA S.p.A.	DOXA S.p.A.	DOXA S.p.A.	IPSOS	IPSOS	IPSOS	IPSOS	IPSOS
MT	-	-	-	-	-	-	Grant Thornton Services	Grant Thornton Services	EMCS

	Wave 1	Wave 2	Wave 3	Wave 4	Wave 5	Wave 6	Wave 7	Wave 8/ SCS1	Wave9/ SCS2
NL	TNS Nipo	TNS Nipo	TNS Nipo	TNS Nipo	TNS Nipo	TNS Nipo	-	I&O Research	I&O Research
LU	-	-	-	-	CEPS	CEPS/IN-STEAD	CEPS/IN-STEAD	CEPS/IN-STEAD	CEPS/INSTE-AD
LT	-	-	-	-	-	-	TNS	TNS	TNS
LV	-	-	-	-	-	-	Institute of Socio-logical Research	Institute of Socio-logical Research	Institute of Sociological Research
PL	-	TNS-OBOP	TNS-OBOP	TNS-OBOP	TNS Polska	TNS Polska	TNS Polska	Kantar TNS SA	Kantar TNS SA
PT	-	-	-	GfK Metris	CECS, University of Minho	CECS, University of Minho	CECS, University of Minho	CECS, University of Minho	CECS, University of Minho
RO	-	-	-	-	-	-	GfK Roma-nia	GfK Roma-nia	Wisemetry & Askpeo-ple
SE	Intervjubo-laget IMRI	Intervjubo-laget IMRI	Intervjubo-laget IMRI	Intervjubo-laget IMRI	Intervjubo-laget IMRI	IPSOS Observer Sweden	IPSOS Observer Sweden	IPSOS Observer Sweden	IPSOS Observer Sweden
SI	-	-	-	CJMMK	CJMMK	IPSOS	IPSOS	IPSOS	IPSOS
SK	-	-	-	-	-	-	GfK Slova-kia	GO4in-sight & ACRC	GO4insight & ACRC

6.3   Monitoring Fieldwork in SHARE

This section details the classification and computation of survey outcomes and presents all final rates and figures of Wave 9 (SCS2 regular) based on the last data export mid-September 2022. All numbers and figures reported during fieldwork are based on information from the Case CTRL (read: case control), which is the interviewer software to document contact attempts and conduct the interview. As of Wave 9, all Case CTRL data have been routinely cross-checked against interview data during fieldwork. This chapter makes the distinction between baseline/refreshment samples and panel samples, as is done in the monitoring reports. All indicators are graphed over calendar weeks to visualise each country's progress of fieldwork over time. Final rates and interview numbers are then provided again in a final summary graph without trajectories to allow for easier comparison between countries.

6.3.1   Classification of Survey Outcomes

As in previous waves, most representational indicators (i.e.,

those on unit nonresponse) were set as quality targets in the specifications of the model contract of SHARE Wave 9. As usual, we follow the newest edition of AAPOR guidelines and use data from the Case CTRL to classify the baseline/refreshment and longitudinal gross samples[13] of each country into exhaustive and mutually exclusive categories reflecting the survey outcomes for each sample type. All contact information entered into the Case CTRL by interviewers is continuously converted into a so-called "household state". The algorithm which creates the household state divides the sample into three mutually exclusive categories: (i) ineligible households, (ii) eligible households, and (iii) households of unknown eligibility[14]. This is done in a hierarchical way: Once the eligibility status is determined, a new contact code cannot revert the eligibility status back to "unknown". For the sake of completeness, we repeat the same basic concepts laid out in Chapter 8 of the Wave 5 Methodology Volume (Malter & Börsch-Supan, 2015): If a household is classified as ineligible, this is a "final state" which permanently closes a case (i.e., no more actions can be done by interviewers). The same applies to sorting households into subcategories of the household state. A new contact only results in a change of the household state if it involves new information

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13 Baseline/refreshment samples consist of respondents who participate in a regular SHARE interview for the first time. They are completely new to SHARE or participated in a SHARELIFE interview for the first time. Panel or longitudinal samples comprise respondents who have already participated in a baseline or refreshment interview.
14 For details on SHARE's target population and eligibility criteria see Kneip (2013) and Bergmann et al. (2017).

that conceptually trumps the previous information. For example, a household formerly classified as "non-contact" (NC) would switch to "refusal" (R) if the interviewer establishes a successful contact, but the respondent refuses to participate. However, if the interviewer does not reach anyone ("non-contact") in an attempt to convert a previous refusal, the household state remains "R". The hierarchical order of the nexus contact code–household state is shown in Table 6.2.

Table 6.2: Detailed List of Case CTRL Entries and Fieldwork Outcomes at the Household Level

Case CTRL Contact Protocol Entry	Household State
Ineligible	NE
Deceased[3] *In hospital[3]* *In old-age home[4]* *In prison* *Moved abroad* *Language barriers* *Moved, new address unknown[3]* *Address non-existent, house vacant[3]* *No eligible persons after CV* *Household screened as ineligible[5]*	
Eligible	E
Completed interview (incl. end-of-life interview)	CI
Interrupted interview	II
Refusal[1]	R
Preliminary Refusal *Refusal for this interview* *Refusal for this and any further data collections* *Refused during interview (CATI/CAPI)* *Refusal after screening* *Delete request for address/contact details* *Delete request for all data*	
Other non-interview	O
Coverscreen interview completed *Contact, try again* *Contact, appointment for another contact* *Contact, appointment for interview* *Cancelled interview (Refers to interview appointment only)* *Deceased[3]* *In hospital[3]* *In old-age home[4]* *Moved, new address known* *Moved, new address unknown[3]* *Address non-existent, house vacant[3]* *Household screened as eligible*	
Non-contact[2]	NC

Case CTRL Contact Protocol Entry	Household State
Unknown Eligibility	UE
Screening refusal	UE_R
Other screening non-cooperation	UE_O
Screening non-contact	UE_{NC}
No contact attempted	UE_{NCA}

Notes:

[1] For each category, interviewers could distinguish between a soft and a hard refusal, the latter one calling upon intervention from the agency. Neither of the refusal codes set by the interviewer closed a case.

[2] Non-contact for the eligible part of the sample does not apply to the baseline/refreshment sample in the countries, in which age is not available from the sampling frame.

[3] This led to ineligibility only in the baseline/refreshment sample, but not in the longitudinal sample.

[4] Whether this led to ineligibility in the baseline/refreshment sample depended on a country's sampling frame. In the longitudinal sample, institutionalised cases were always considered eligible.

[5] Subcategories are: age ineligible household, problems with phone, address non-existent, language barriers.

6.3.2   Formulas to Compute Survey Outcomes

Apart from eligibility, the household state variable provides information on a household's contact and cooperation status. Table 6.3 reports which fieldwork indicators are used and how they are computed based on the household state. As the current state can be determined by the Case CTRL for every household at any given point in time, we are able to report the state of fieldwork at any time as if it had finished. Household cooperation is considered if at least one eligible household member has been successfully interviewed. Several definitions of individual response rates are possible, depending on how households with unknown eligibility are treated and the way the number of eligible households with unknown composition is determined. These households may or may not contain eligible individuals. Different assumptions about their number directly affect the denominator of the response rate. In general, we assume that only a fraction p of the households with unknown eligibility are in fact eligible and estimate this fraction by $\frac{E}{E+NE}$. Over the course of fieldwork, this estimate improves in precision as the non-attempted part of the sample declines.

The number of eligible persons per household is only known for households with a completed Coverscreen Interview (CV). Based on the assumption that, in each country, the average number of eligible persons in households without a CV does not systematically differ from that in households with a CV, we take the latter as an estimate for the baseline or refreshment samples. For households in the longitudinal sample without a CV, we can use preload information on the household composition to assess the number of eligible respondents. Here, the assumption is that this number has not changed since the last interview. By estimating the average

number of eligible respondents $\bar{n}$ in a specific sample, the total number of eligible respondents – and thus the denominator of the individual response rate – is $\bar{n}(E+pUE)$.

Table 6.3: Outcome Rate Formulas

Estimated proportion of eligible households	$$p=\frac{E}{E+NE}$$
Percentage of households attempted	$$\frac{(CI+PI+R+II+O+NC)+(UE_R+UE_O+UE_{NC})+NE}{GS}$$
Household contact rate (AAPOR CON2)	$$\frac{(CI+PI+R+II+O)+p(UE_R+UE_O)}{E+p \cdot UE}$$
Household cooperation rate (cf. AAPOR COOP2)[1]	$$\frac{(CI+PI)}{(CI+PI+R+II+O)+p(UE_R+UE_O)}$$
Household response rate (AAPOR RR4)	$$\frac{(CI+PI)}{E+p \cdot UE}$$

Household refusal rate (AAPOR REF2)	$$\dfrac{R+II+p(UE_R)}{E+p\cdot UE}$$
Household other non-interview rate (AAPOR ONI2)	$$\dfrac{O+p(UE_O)}{E+p\cdot UE}$$
Individual response rate[2]	$$\dfrac{(CI_r+PI_r)}{\bar{n}(E+p\cdot UE)}$$

Notes:
[1] $p(UE_R+UE_O)$ is not part of the denominator in AAPOR COOP2. The calculation method was adapted for equation RR=CON×COOP to hold.
[2] $\bar{n}$ is the average number of eligible persons per household. For baseline/refreshment sample $\bar{n}$ is estimated based on households with completed Coverscreen. For the longitudinal sample, information on household composition is available for all households from the previous wave. CI_r and PI_r refer to the number of completed and partially completed interviews, respectively.

6.4 Fieldwork Outcomes of SHARE Corona Survey 2

The data collection of SCS2 concluded in August 2021. The survey was based on all panel households that participated in the SCS1, fulfilling the usual SHARE eligibility rules. The last extraction of data took place in calendar week 36. More than 50,000 interviews were conducted in 28 countries, accomplished with the help of over 1,100 interviewers across Europe and Israel. This includes a total of 49,635 SCS2 interviews and 855 End-of-Life interviews.

Figure 6.3 shows the size and composition of SCS2's longitudinal sample per country. The size of the longitudinal gross sample is defined by the number of households with at least one age-eligible respondent interviewed in any previous SHARE wave. For the purpose of fieldwork monitoring, the longitudinal gross sample is determined by the number of households preloaded into the Case CTRL. Households that refused to participate in the survey and asked not to be contacted again must not be attempted again for legal reasons and are dropped. Overall, the lon-

gitudinal gross samples of all countries almost exclusively contain eligible cases (99.1 percent), with the lowest share in Denmark (96.4 percent) and the highest in Belgium (Dutch), Bulgaria, Switzerland, Italy and Latvia (100 percent). While Estonia had the largest panel sample with more than 3,000 eligible households, most countries had samples of 1,000 or less eligible households.

Figure 6.3: Panel Samples by Classification of Sample Units
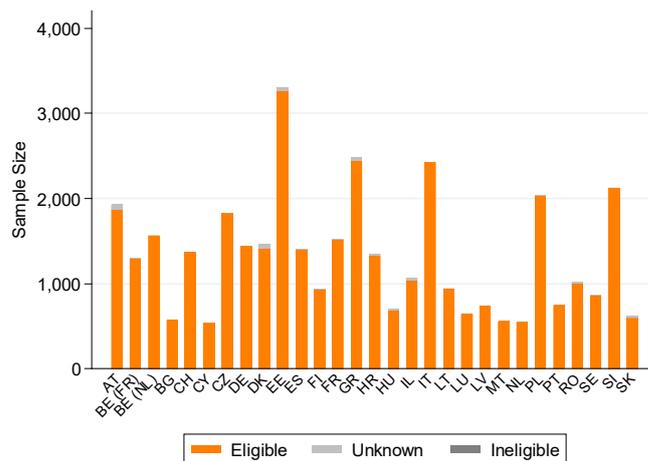
Households in the longitudinal sample can only become ineligible for the following reasons: incarceration, moving abroad, and language barriers. As can be seen in Figure 6.3, the sample for the SCS2 does not include any ineligible persons. Death does not lead to ineligibility. Instead, a proxy respondent is supposed to respond to an End-of-Life interview about the deceased person. Households without any contact attempts are of unknown eligibility. On average and according to what was documented in the Case CTRL, only 0.9 percent of all longitudinal households were of unknown eligibility in SCS2.

6.4.1 Contacting Households

Figure 6.4 below shows, by country, the fraction of households in the longitudinal gross sample in which a contact was attempted, i.e. all households in which either a contact attempt was successful or an interviewer reported a contact attempt but was unable to actually reach a member of the household.

Figure 6.4: Fraction of Panel Households with Contact Attempts by Country over Time
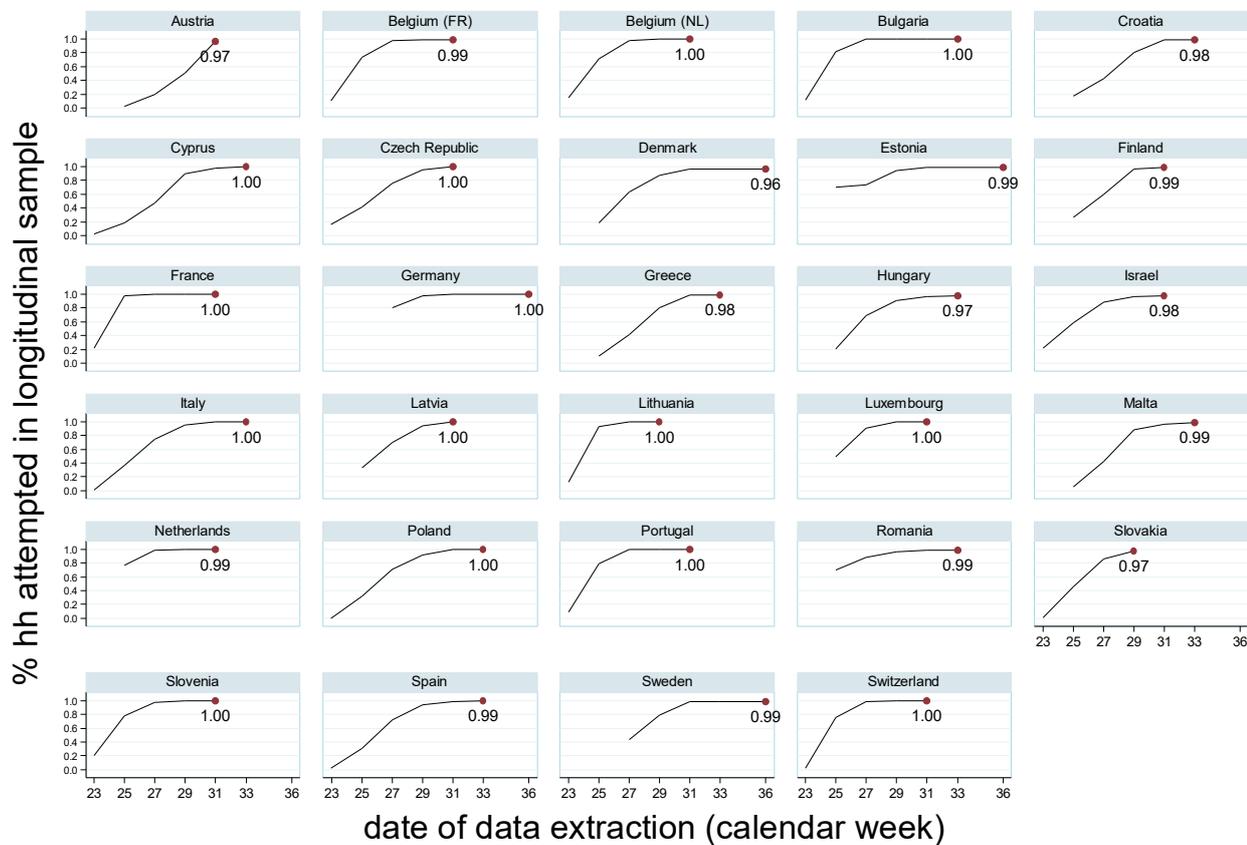
Graphs by country

The high rates in all countries reflect the strenuous efforts of all survey agencies engaged in fieldwork to get in touch with the panel households. Most countries were able to contact at least 99 percent of their sample.

Figure 6.5 below shows contact rates by country. This contains contact attempts which resulted in an actual contact. It may also include households with at least one complete interview.

Figure 6.5: Contact Rate of Panel Households by Country over Time
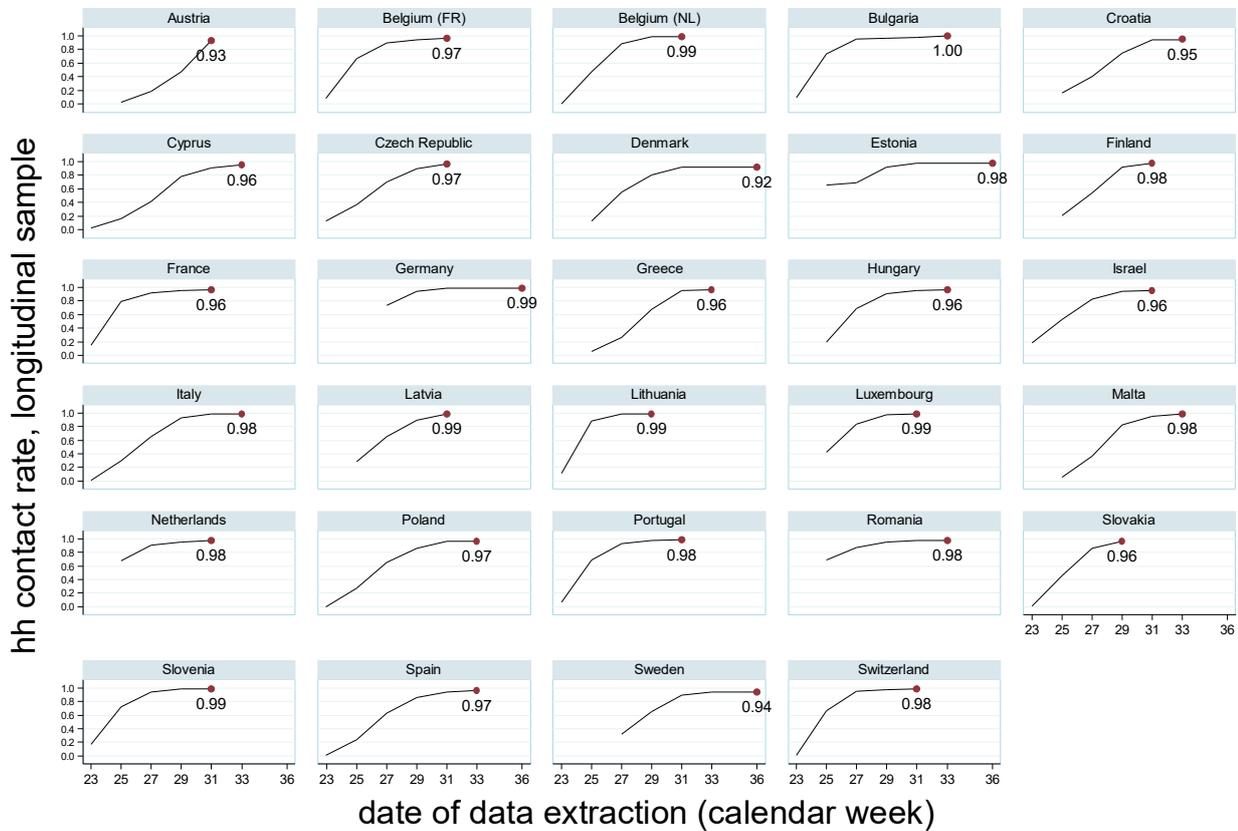
Graphs by country

In practically all countries, the efforts of trying to reach households were primarily successful, which is evident from the close convergence of the trend in contact rates in Figure 6.4 with the rates of attempting households in Figure 6.3.

6.4.2 Household Cooperation and Response Rate

Figure 6.6 below shows the cooperation rate of panel samples, i.e., the rate of contacted households that have at least one completed interview.

Figure 6.6: Cooperation Rate of Panel Households by Country over Time
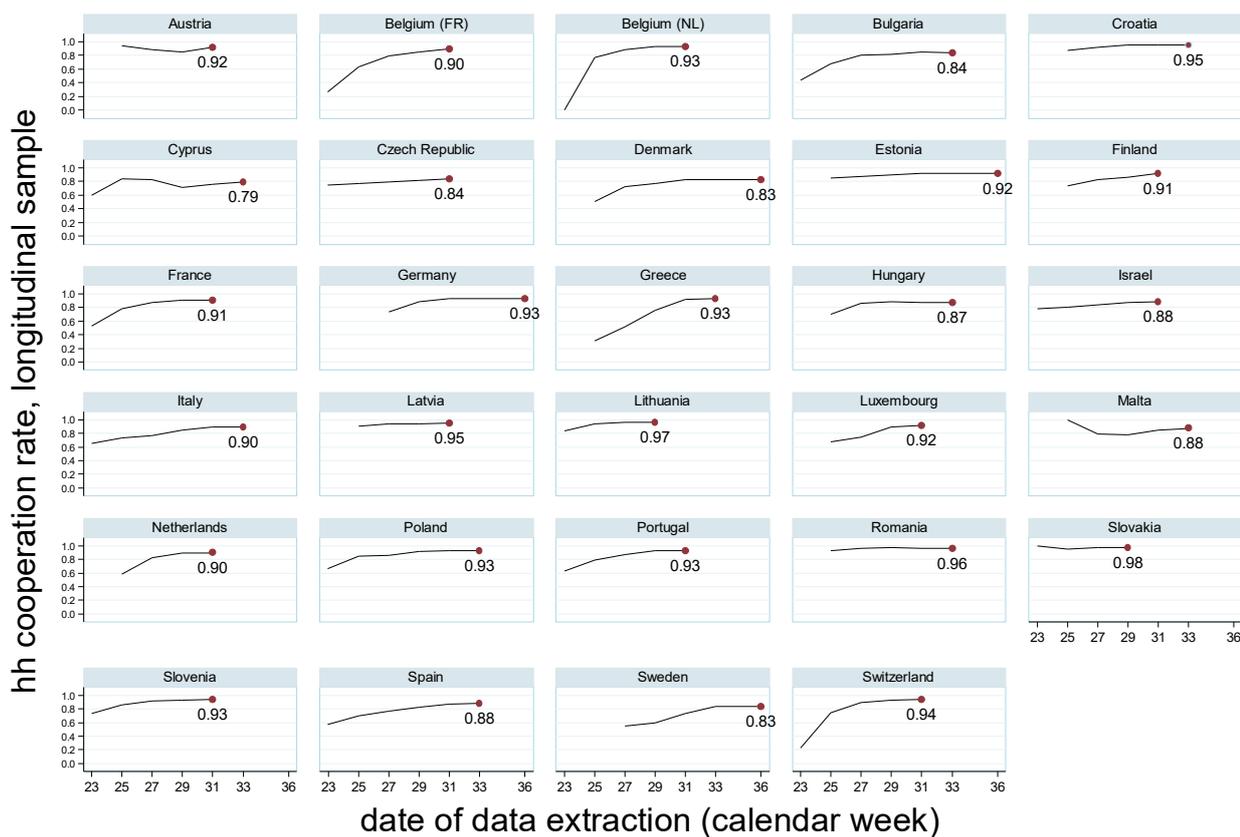
Graphs by country

Most countries have been able to achieve cooperation rates above 90 percent. This is a positive signal, as the cooperation rate is a logical step to the final retention rate.

Figure 6.7 below shows the response rate of panel samples, i.e., the number of panel households with at least one complete interview divided by the total number of (estimated) eligible panel households.

Figure 6.7: Response Rate of Panel Households by Country over Time
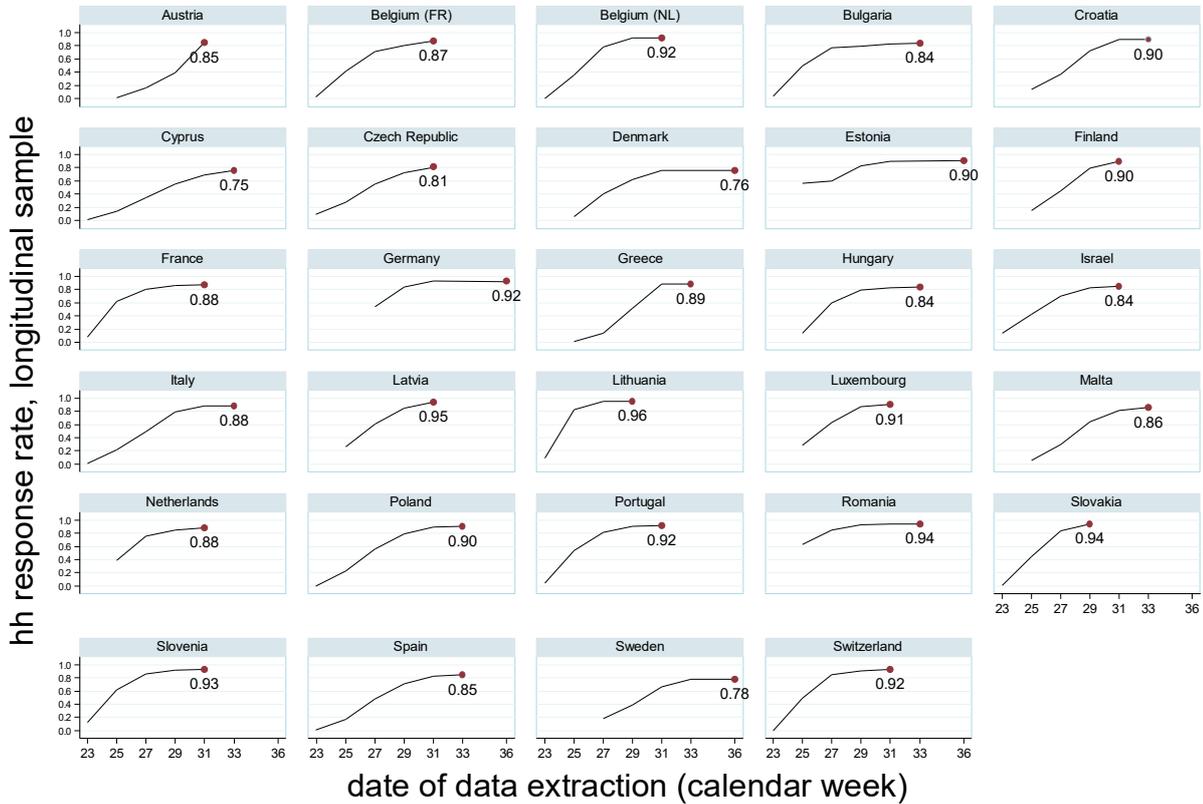
Graphs by country

Most countries have a sufficient household response rate with 85 percent or more.

6.4.3 Individual Response Rate

Figure 6.8 below shows the individual response rate of panel samples.

Figure 6.8: Response Rate of Panel Households by Country over Time

Graphs by country
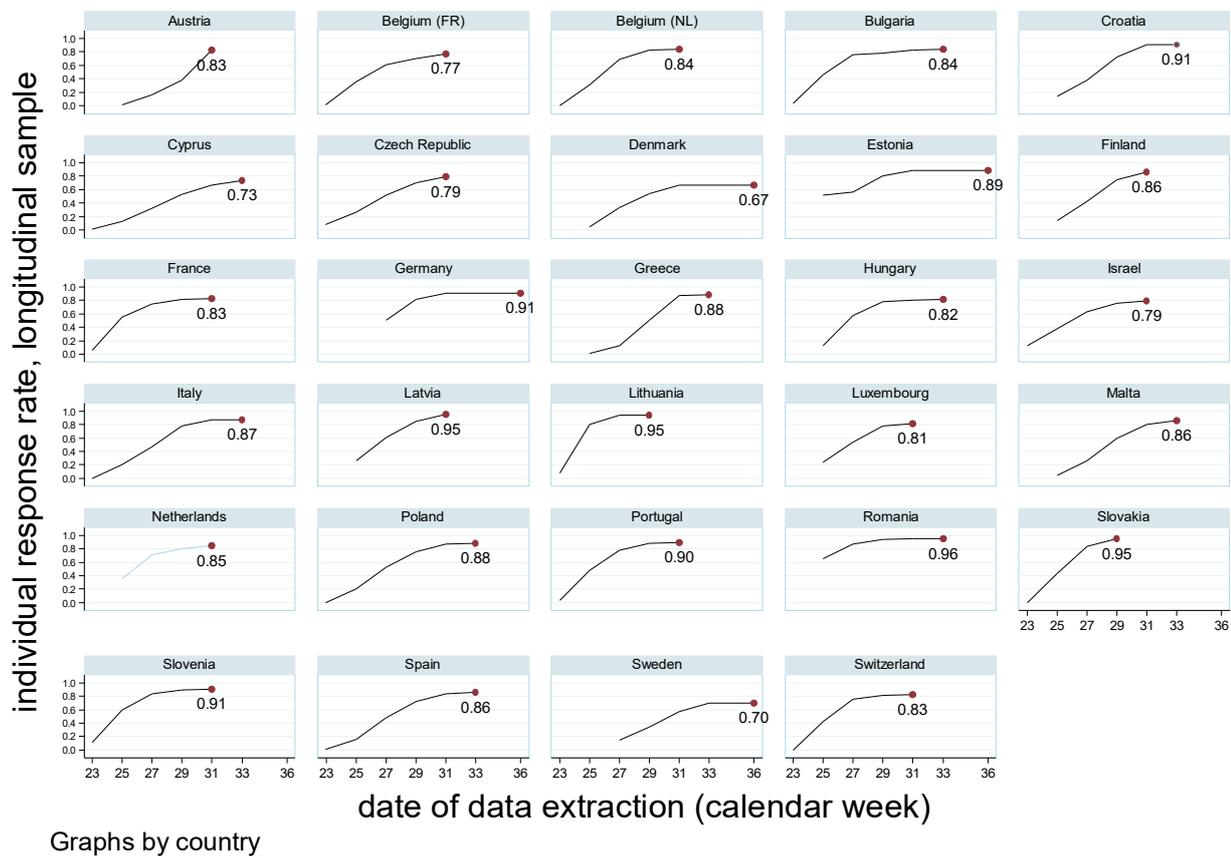
With some exceptions with response rates of around 70 percent, most countries exceeded our goal response rate of 85 percent. Romania, Latvia, Lithuania and Slovakia are the countries with the highest retention rates of 95 – 96 percent.

6.4.4   Summary of SHARE Corona Survey 2

Figure 6.9 shows the final household-level contact, cooperation, and retention rates of the SCS2 samples after the end of fieldwork.

Figure 6.9: Contact, Cooperation and Retention Rates for the SHARE Corona Survey 2
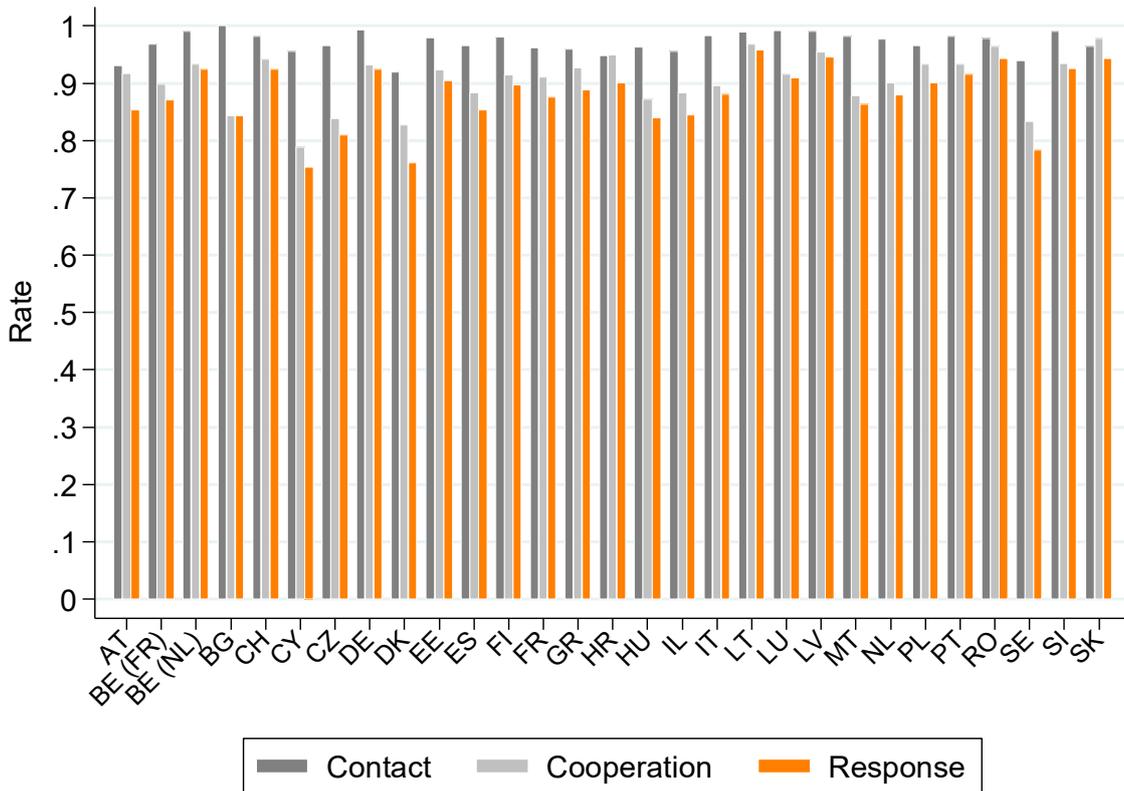
Participation in the SCS2 was outstanding. All contact rates are between 90 and 100 percent. With three exceptions (Cyprus, Denmark, Sweden), the final household retention rates range between 80 and 96 percent. Figure 6.10 shows the absolute number of interviews per country at the end of SCS's fieldwork. Detailed breakdowns can be found in the appendix of this chapter.

Figure 6.10: Absolute Numbers of Interviews in the SHARE Corona Survey 2 Samples
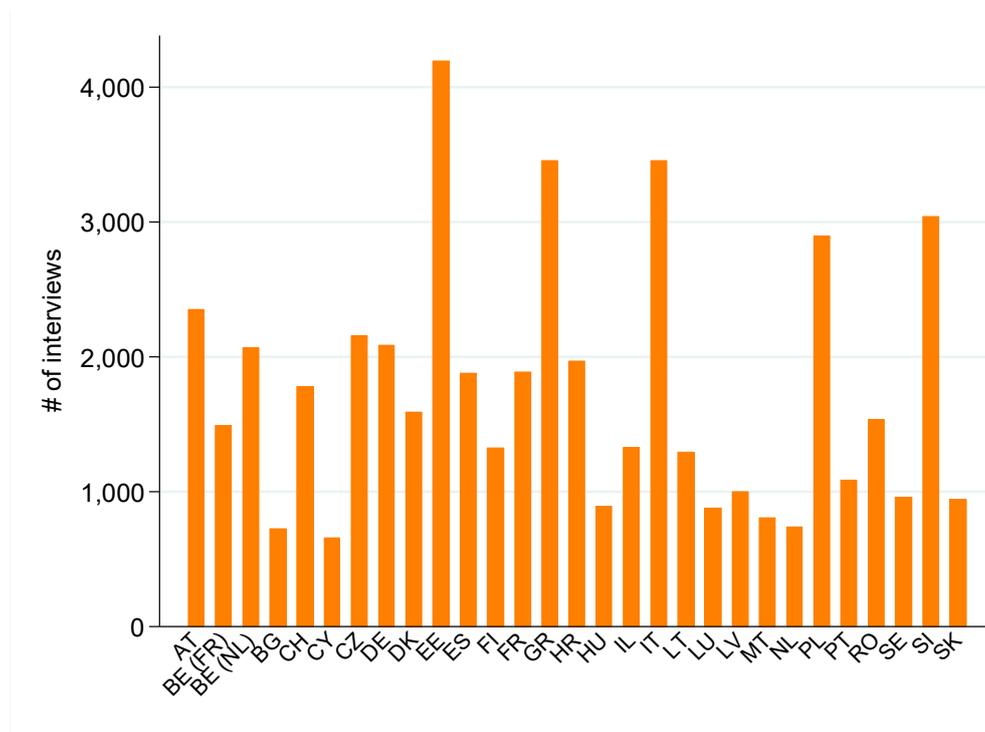
The number of completed interviews ranges from 660 in Cyprus to 4,193 in Estonia.

6.5   Fieldwork Outcomes of SHARE Main Wave 9

6.5.1   Refreshment Samples in the SHARE Main Wave 9

Due to the pandemic, the refreshment samples that were drawn for Wave 8 are still relevant for Wave 9. In Wave 8, 18 countries drew a refreshment sample: Austria, Belgium, Croatia, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Israel, Latvia, Poland, Portugal, Slovenia, Spain, Sweden, and Switzerland[15]. Refreshment samples that were drawn in Wave 8 but could not be worked off completely due to the discontinuation of fieldwork with the start of the pandemic were now readdressed in the regular SHARE Wave 9. Therefore, all results presented in this chapter must be seen in comparison with the results from Wave 8 (see Methodology Volume Wave 8). This is especially true for Switzerland, Denmark, Estonia, Hungary, Latvia and foremost Israel, which were stopped right in the middle of fieldwork, Israel even at the very end of fieldwork. All other countries had to stop fieldwork rather early in their contact phase of the refreshment sample. No new refreshment samples were drawn in Wave 9.

Figure 6.11 shows the size of the refreshment samples. Apart from the reasons leading to ineligibility in the longitudinal sample (i.e., incarceration, moving abroad, language barriers), refreshment households are also considered ineligible in the following cases: death of the drawn respondent, in-patient treatment during the entire field time, unknown or invalid addresses, and if the Coverscreen (CV) interview yields no eligible persons in the household.

The samples in the Czech Republic, France, Israel and Latvia had to be screened for age-eligibility first, as no personal registers including information on age exist in these countries. Therefore, ineligibility could also be an outcome of a screening contact. However, the fraction of ineligible households was highest in Croatia, which might be due to outdated addresses that had

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15   Furthermore, Finland, Spain, and Portugal drew refreshment samples, but were not able to field them due to the suspension of fieldwork in March 2020.

originally been drawn in 2019 for Wave 8. Households are classified as having "unknown eligibility" after any form of screening non-response (non-contact, refusal, other non-response). This share is largest in the Czech Republic.

Figure 6.11: Refreshment Samples by Classification of Sample Units
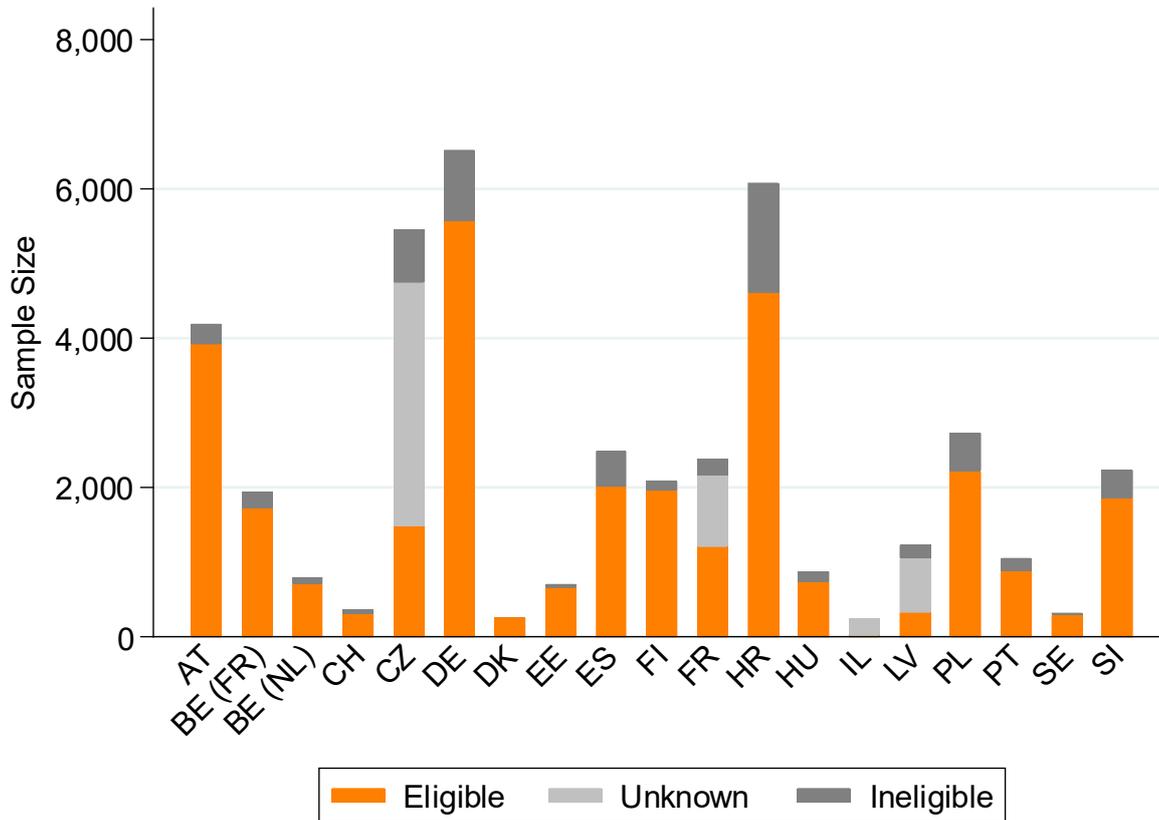
6.5.1.1   Contacting Households

Figure 6.12 shows the fraction of households in the refreshment samples where a contact was attempted (i.e., all households where either an interviewer reports a contact attempt but was unable to actually contact anybody or where a contact is successful). This also includes households with one or more conducted interviews. The last data extraction before the close of fieldwork took place in week 37 in 2022. The corresponding data point provides the final rates according to completed Case CTRL data extractions for each country.

Figure 6.12: Fraction of Refreshment Sample Households with Contact Attempts by Country over Time
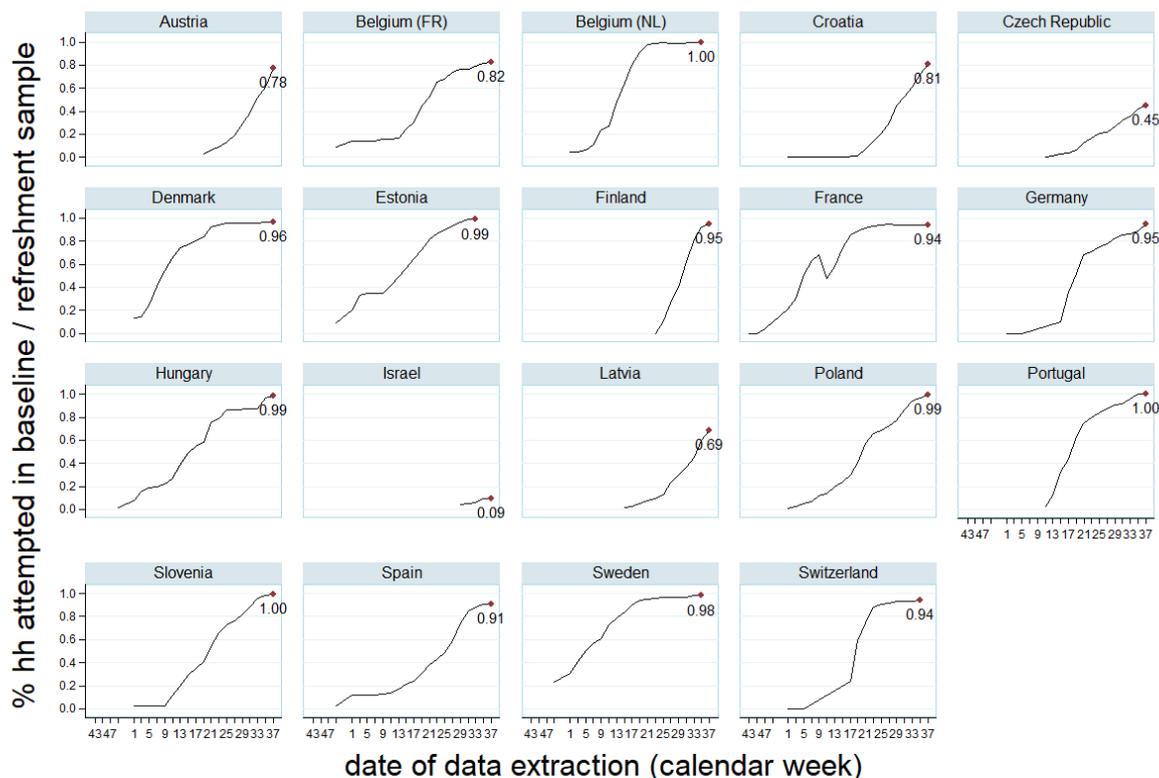
Most countries attempted to contact at least 95 percent of their sample. The rather low rates that can be seen in Latvia and especially in Israel can be explained by the fact that those countries had already contacted a large part of their refreshment sample in Wave 8. Israel even managed to reach the target response rate before the suspension of Wave 8 fieldwork. It thus only finished already attempted cases in Wave 9.

Further, the Czech Republic had activated a very large sample at the beginning of regular Wave 9 fieldwork to allow for maximum flexibility in reaction to the ongoing pandemic. Due to the rapidly changing COVID-19 situation, many households could not be attempted at all until the end of fieldwork.

Figure 6.13 shows household contact rates by country. This contains contact attempts, which resulted in an actual contact. This may also include households with at least one completed interview.

Fieldwork of the refreshment sample looked to be exceptionally affected by the ongoing pandemic, as evidenced by the contact rates that are 10 to 20 percentage points lower in some countries than the rates of attempted households.

Figure 6.13: Contact Rate of Refreshment Sample Households by Country over Time
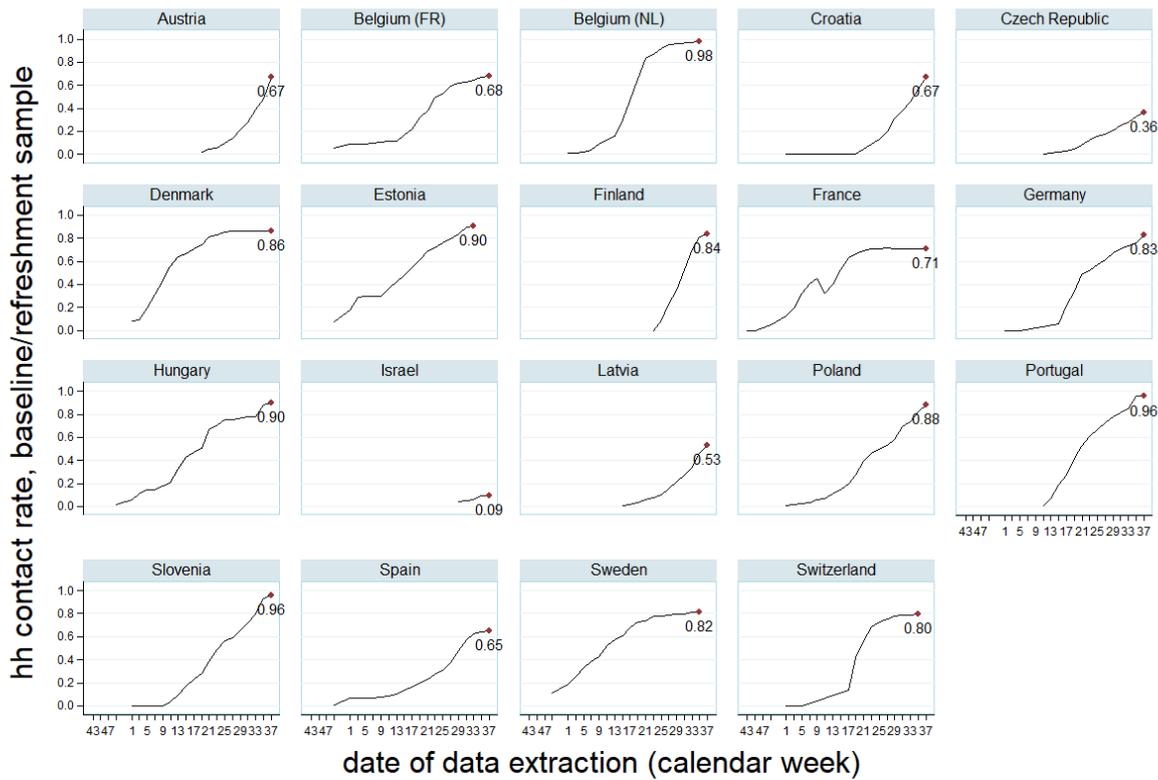
Graphs by country

6.5.1.2 Household Cooperation and Response Rate

Figure 6.14 shows the cooperation rate of refreshment samples by country (i.e., the rate of all contacted households that have at least one completed interview).

Figure 6.14: Cooperation Rate of Refreshment Sample Households by Country over Time
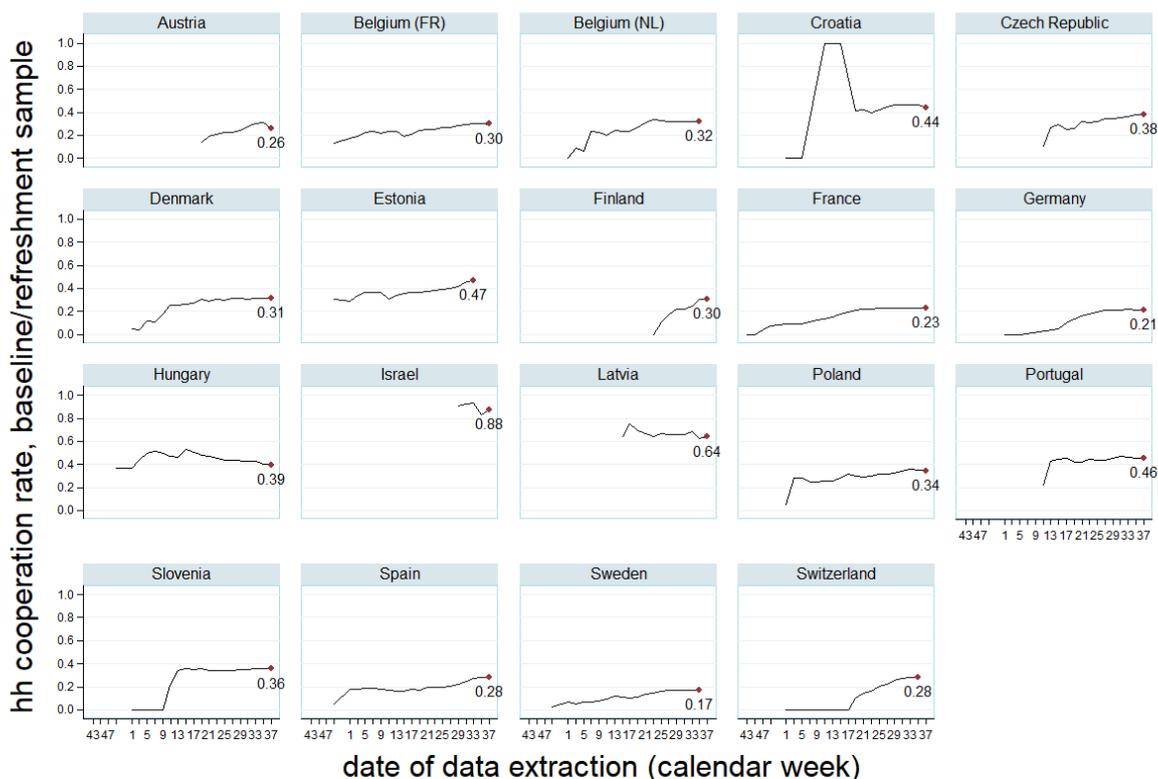
The cooperation rate is based only on sample units with a previous contact. For this reason, it can fluctuate upwards or downwards (e.g., in Croatia, the jump in Figure 6.14 is due to the fact that it is based on very small number of contacted cases). The more contacts have been established, the less it fluctuates and the better it can be interpreted. The cooperation rates vary between 17 percent in Sweden and 88 percent in Israel (especially the result for Israel has to be seen together with Wave 8 results for the reasons mentioned above).

Figure 6.15 shows the household response rate (i.e., the number of refreshment households with at least one complete interview divided by the total number of (estimated) eligible refreshment households).

Figure 6.15: Response Rate of Refreshment Sample Households by Country over Time
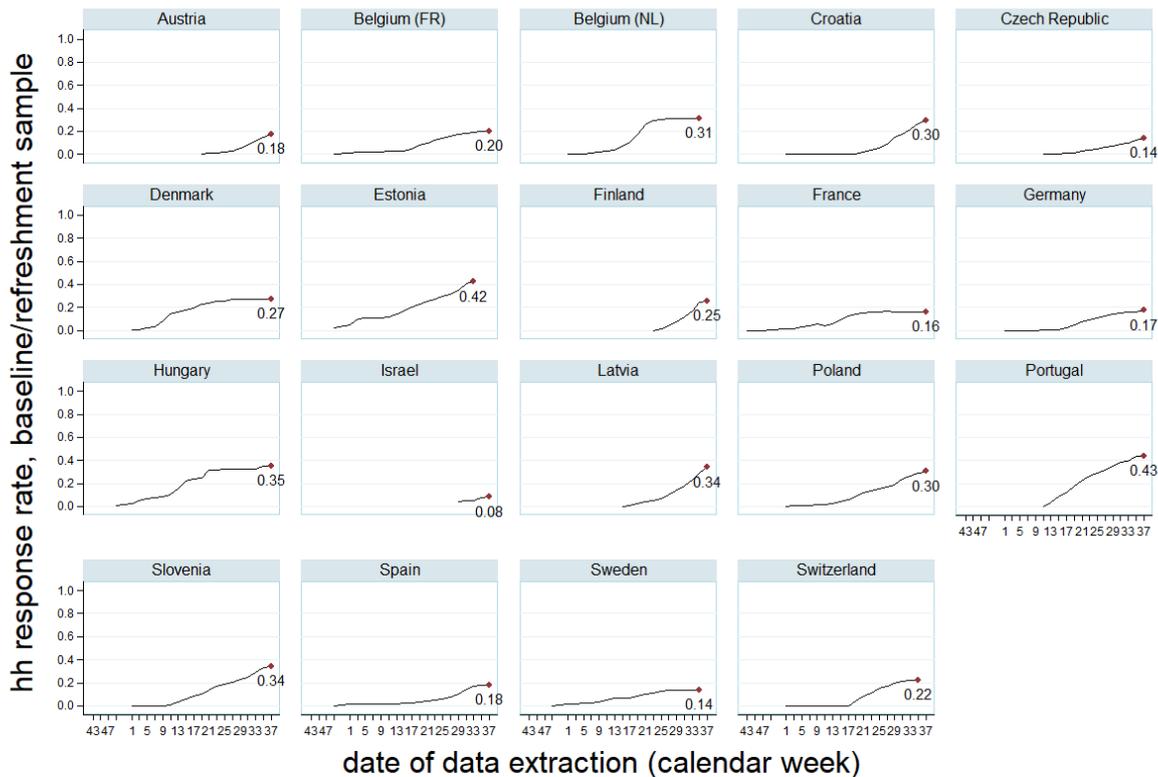
Graphs by country

The household response rate varies between 8 percent in Israel and 43 percent in Portugal. The rates of Switzerland, Denmark, Estonia, Hungary, Latvia and especially Israel should be compared to the results of Wave 8.

6.5.1.3   Individual Participation of Refreshment Samples

Figure 6.16 shows the individual response rate of refreshment samples in Wave 9.

Figure 6.16: Individual Response Rate of Refreshment Respondents by Country over Time
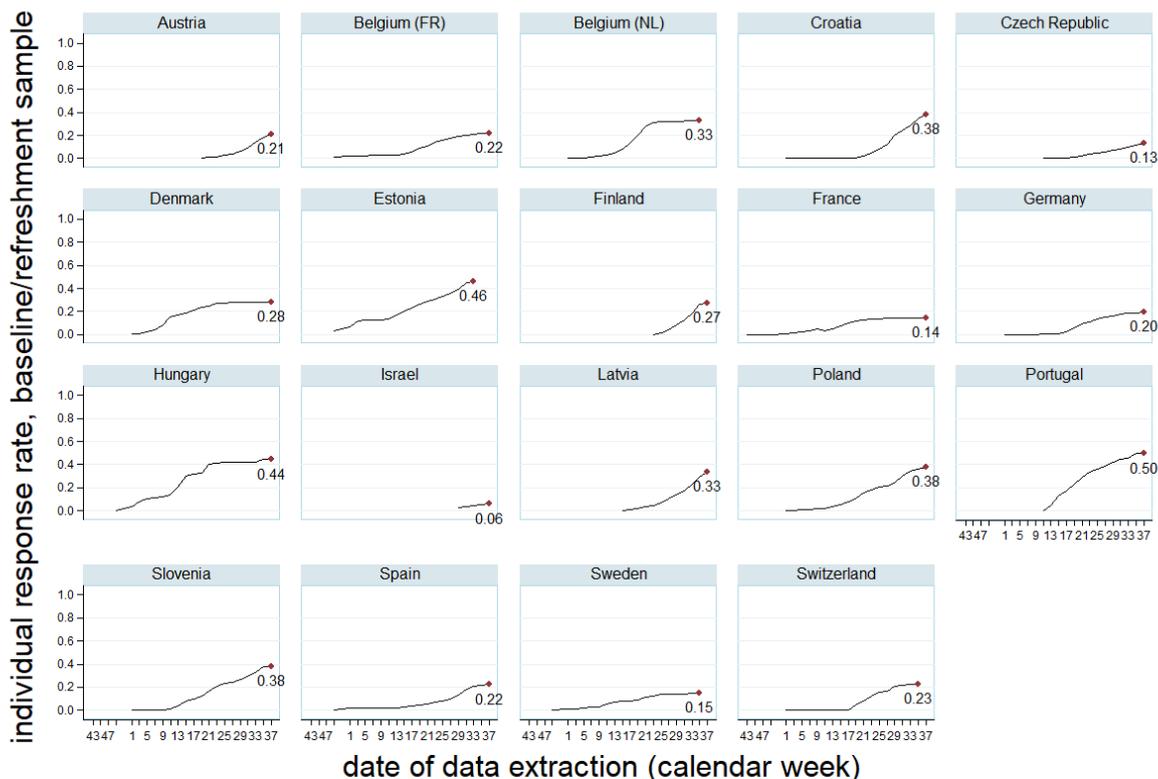
The individual response rates largely vary between 6 percent in Israel and 50 percent in Portugal. Israel had already reached the goal response rate of 43 percent before fieldwork had to be suspended in Wave 8. Thus, as mentioned before, the response rate presented in this chapter can only be correctly evaluated when seen together with Wave 8 results.

6.5.1.4 Summary of Refreshment Samples

Figure 6.17 shows the final household contact, cooperation, and response rates at the end of face-to-face fieldwork of Wave 9.

Figure 6.17: Contact, Cooperation and Response Rates for Refreshment Samples
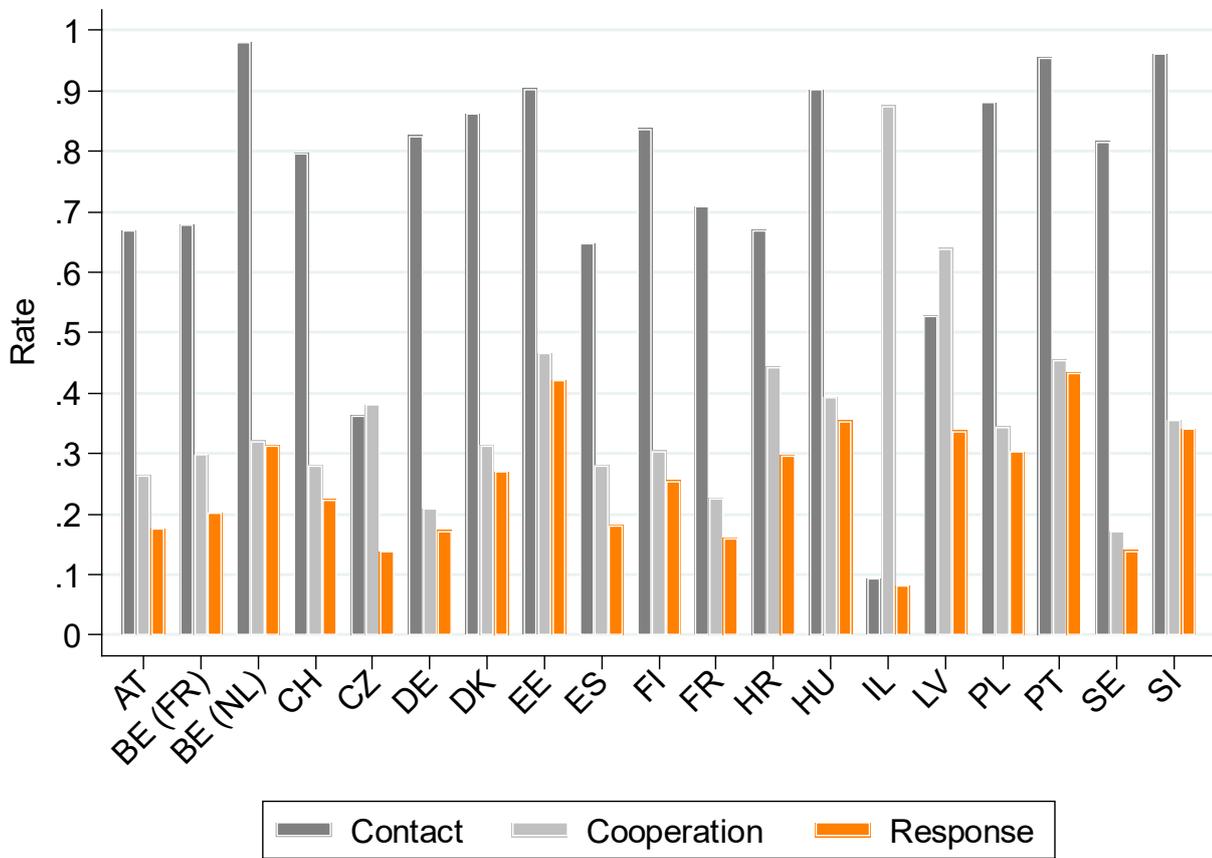
Due to the special situation of the COVID-19 pandemic, which interrupted the interviewing of the refreshment samples in Wave 8 and could only resume it in Wave 9, the contact rates are quite low compared to earlier waves because they must be seen in addition to the results from Wave 8. It can also be seen that the cooperation rates are much lower than the contact rates, which shows the difficulties that interviewers encountered while contacting new households during an ongoing pandemic. Figure 6.18 shows the final household- and respondent-level response rates.

Figure 6.18: Household- and Respondent-level Survey Participation in Refreshment Samples
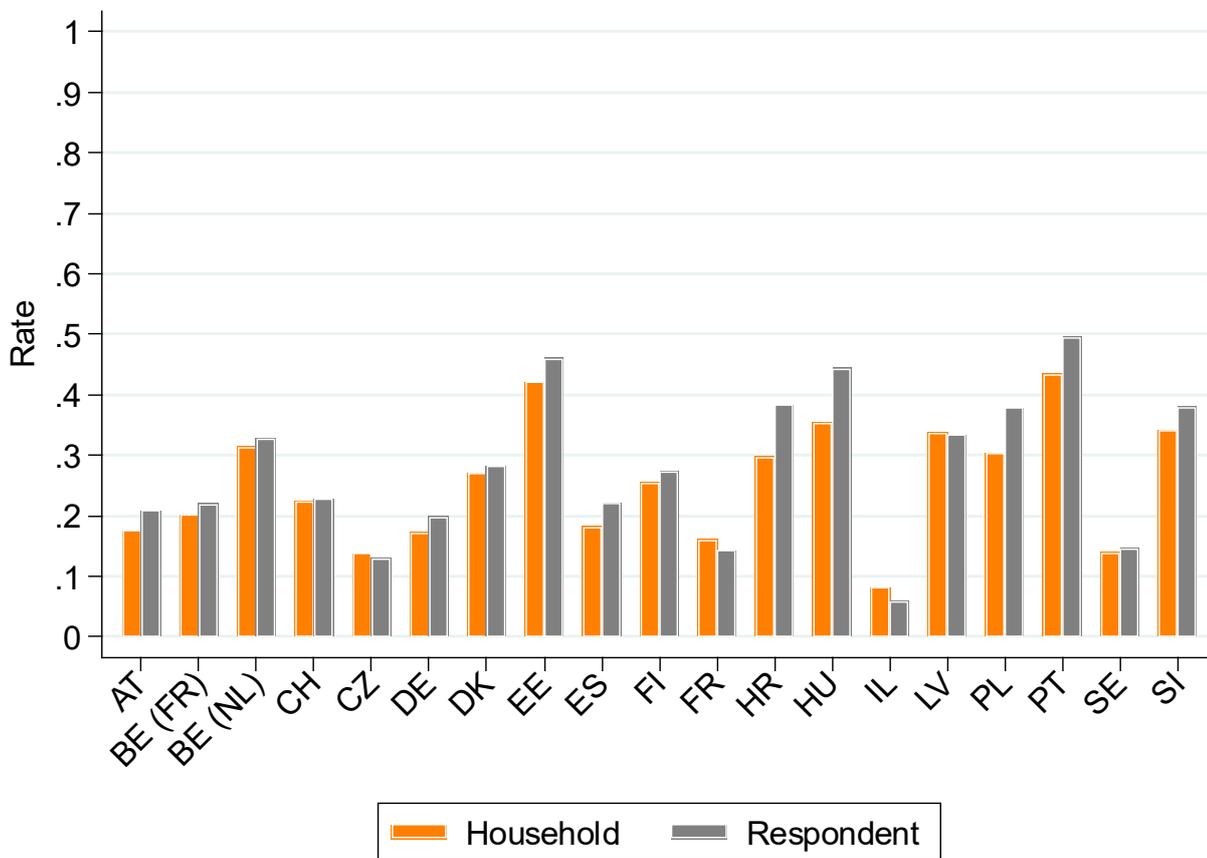
Consequently, the household and individual response rates are low as well. With the exceptions of Belgium (NL), Estonia, Croatia, Hungary, Latvia, Poland, Portugal and Slovenia, all countries are below the 30 percent mark. The individual response rates are always slightly lower than the household response rates because of non-cooperation among some household members. The gap between both rates is smallest in Switzerland, Czech Republic, Latvia and Sweden, which means that in these countries, interviewers managed best to convince all household members to participate. Figure 6.19 shows the absolute number of interviews per country in the refreshment samples at the end of fieldwork. Again, we must point out that the results that are shown for Israel must be seen together with the results from Wave 8, as most of the fieldwork in this sample had already taken place. Figure 6.19 shows the absolute number of interviews per country in the refreshment samples at the end of fieldwork.

Figure 6.19: Absolute Number of Interviews in Refreshment Samples
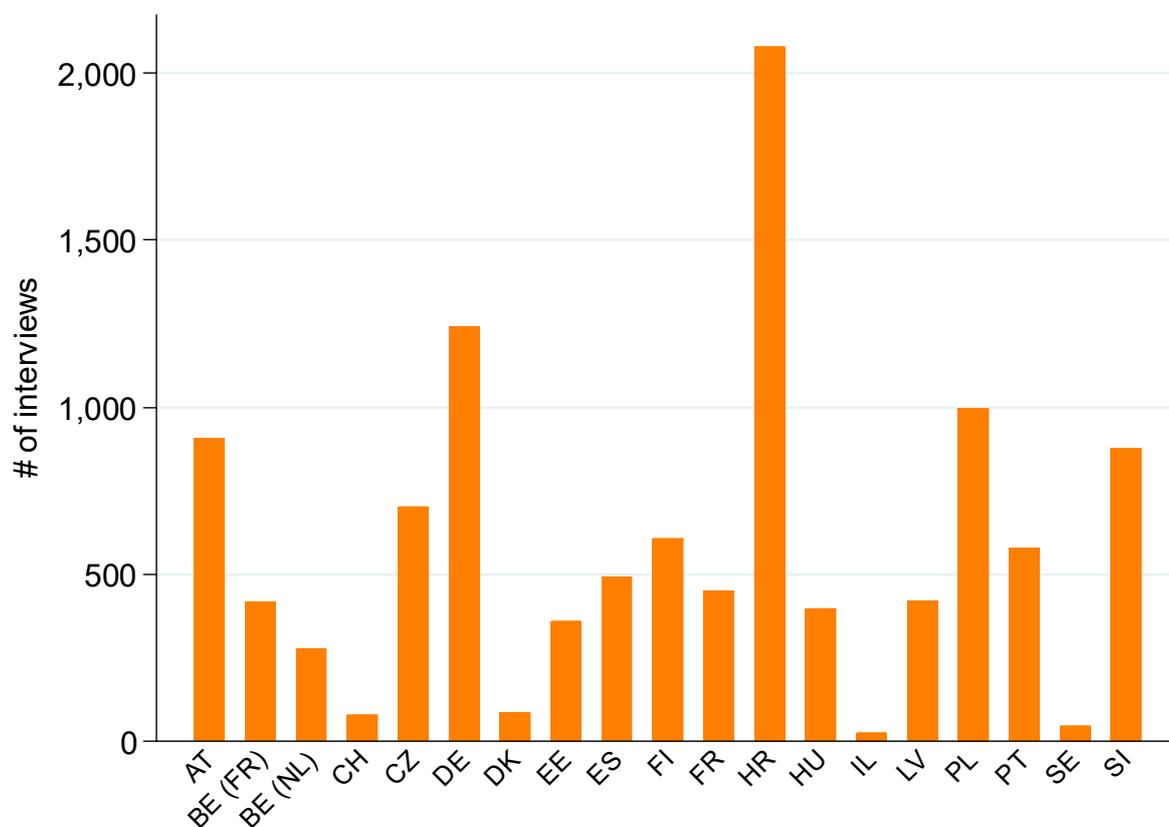
The number of interviews varies by country, sample size and state of fieldwork before the break-off in Wave 8. Germany had the largest refreshment sample fielded but only the second largest number of interviews. Croatia had the second largest sample and is the country with the highest number of interviews.

6.5.2 Panel Samples in SHARE Main Wave 9

In previous waves, longitudinal samples were divided into five subsamples at the individual level according to SHARE's eligibility rules. However, in Wave 9, subsamples were no longer used so as to simplify the process. Consequently, response rates are reported in Wave 9 for the entire sample.

Figure 6.20 shows the size and composition of the longitudinal sample per country in regular Wave 9. At the household level, the size of the longitudinal gross sample is defined by the number of households with at least one age-eligible respondent interviewed in any previous SHARE wave. For the purpose of fieldwork monitoring, the longitudinal gross sample is determined by the number of households preloaded into the Case CTRL. Households that must not be attempted again for legal reasons are dropped. Overall, the longitudinal gross samples of all countries contain almost exclusively eligible cases (99.3 percent), with the lowest share in Luxembourg (97.8 percent) and the highest in Israel (100 percent). While Estonia had the largest panel sample with more than 4,000 eligible households, most countries that joined SHARE in Wave 7 had samples of around 1,000 eligible households (e.g. Bulgaria, Cyprus, Latvia, Slovakia).

Figure 6.20: Panel Samples by Classification of Sample Units
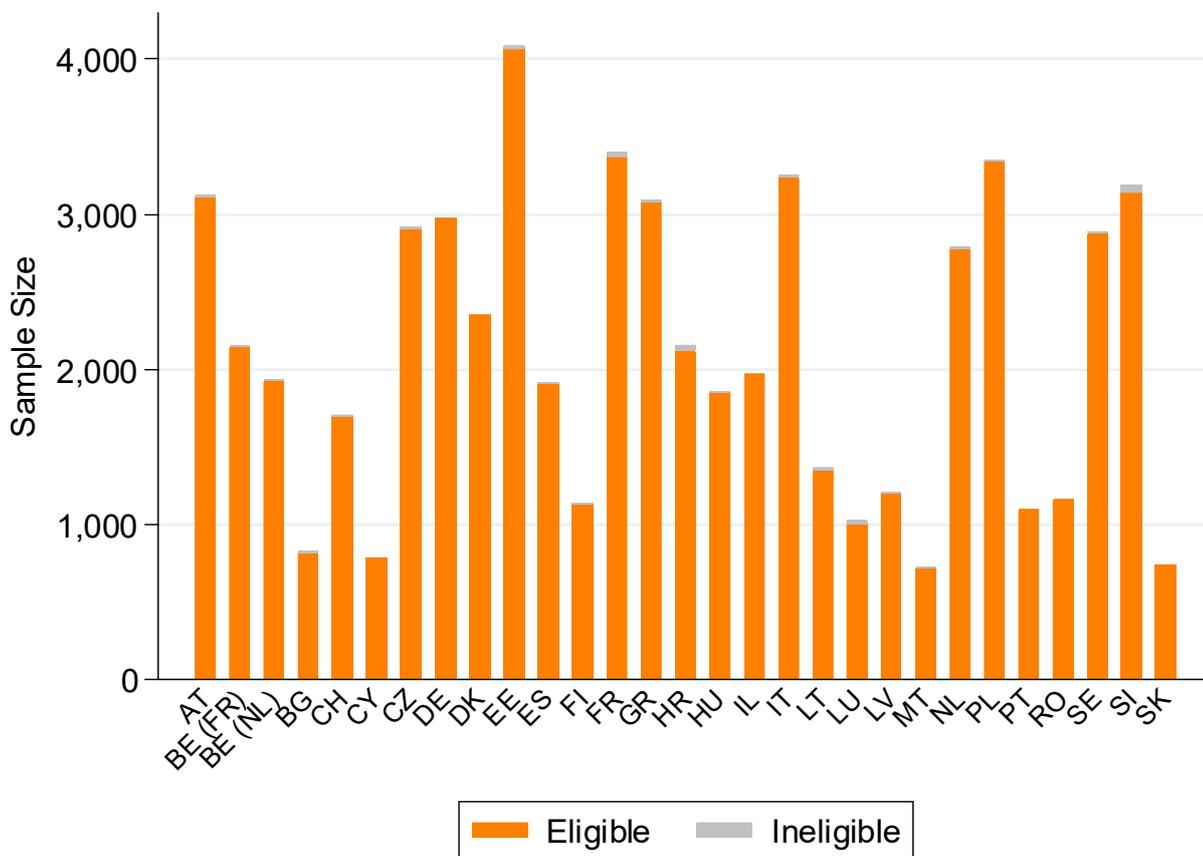
As said before, households in the longitudinal sample can only become ineligible due to incarceration, moving abroad, and language barriers. Death does not lead to ineligibility. Instead, a proxy respondent is supposed to respond to an End-of-Life interview about the deceased person. On average, ineligibility applies to 0.7 percent of all households in the longitudinal samples. Households with no contact attempts are considered to be eligible.

6.5.2.1 Contacting Households

Figure 6.21 shows the fraction of households in the longitudinal gross sample in which a contact was attempted (i.e., all households with a reported contact attempt, regardless of the success of the attempt). The data point at calendar week 37 provides the final rates for each country.

Figure 6.21: Fraction of Panel Households with Contact Attempts by Country over Time
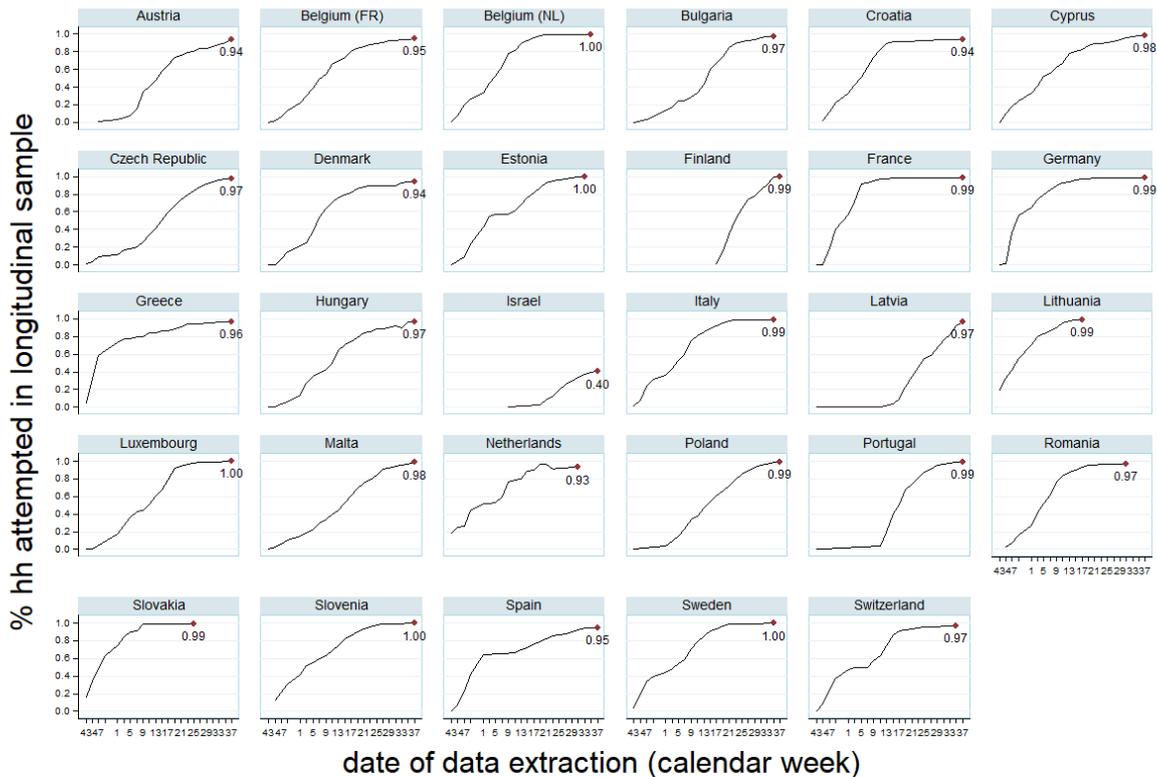
Fieldwork was extended to include the summer months July and August, enabling most countries to achieve contact attempt rates of about 95 percent or more. The only exception was Israel that had suffered from an extremely uncertain COVID-19 situation and many interviewers fearing an infection. Therefore, fieldwork had to be postponed several times (see Figure 6.2) and could not be carried out exhaustively. However, it must be emphasised that the well-being of our respondents as well as our interviewers has been the top priority, even at the cost of a better fieldwork performance. In addition, some countries (e.g., Belgium (NL), France, Germany, Greece, Slovakia) have a steep increase that levels out over time (i.e., interviewers were quick at attempting most households for contact at the beginning of fieldwork), while others show a linear trend, possibly due to a different contact strategy.

Figure 6.22 shows breakdowns of household contact rates by country over time. This contains contact attempts which resulted in an actual contact (i.e., at least one household member was reached).

Figure 6.22: Contact Rate of Panel Households by Country over Time
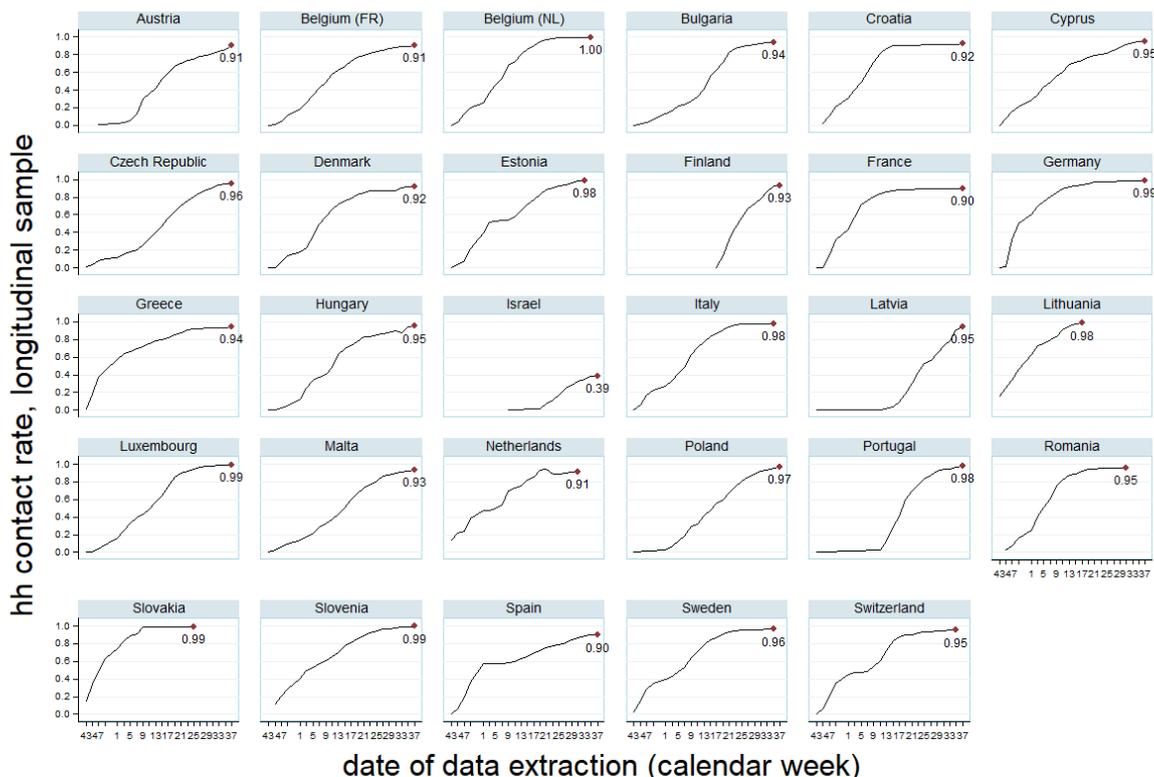
The trajectories of the contact rates are similar to the rates on attempted households reported above. Exceptions are France and Finland who seem to have been less successful in converting contact attempts into actual contacts compared to other countries. Spain, France and Israel have the lowest contact rates. The highest contact rate of 100 percent was achieved in Belgium (NL).

6.5.2.2   Household Cooperation and Response Rate

Figure 6.23 shows the cooperation rate of panel samples by country (i.e., the rate of all contacted households that completed at least one interview).

*Figure 6.23 Cooperation Rate of Panel Households by Country over Time*
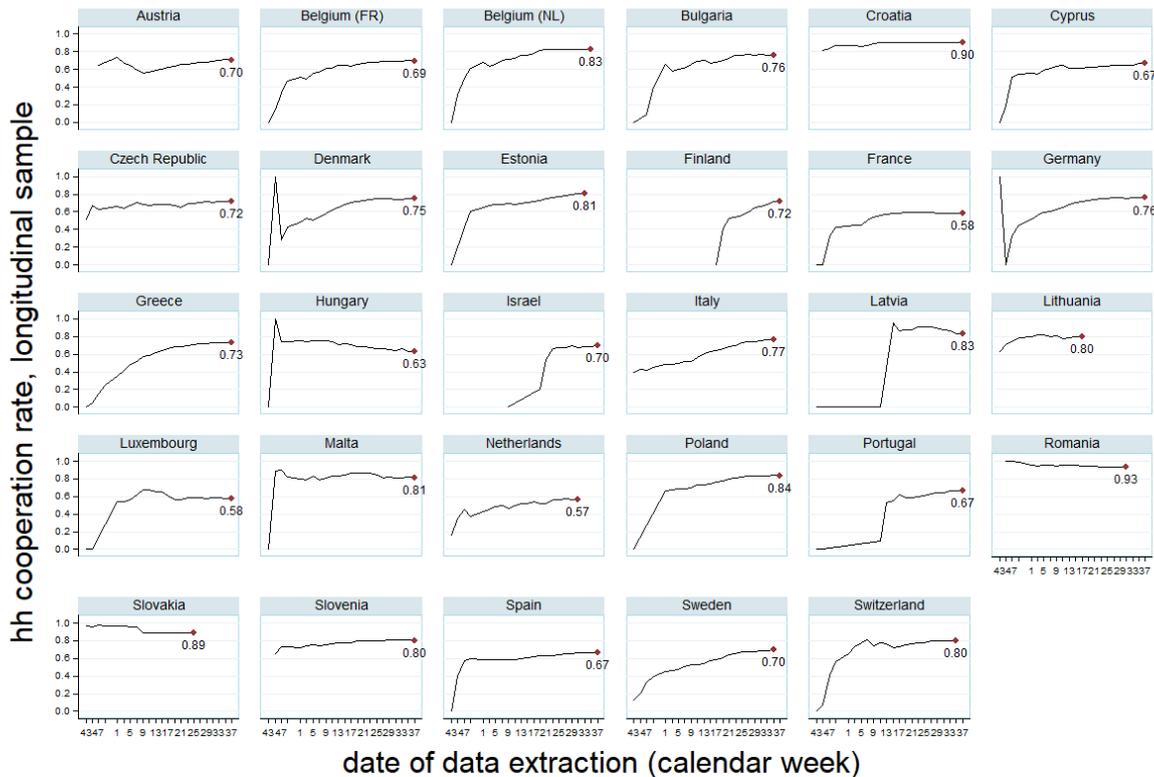
Since the cooperation rate is based on sample units with a previous contact, it is the only rate that can fluctuate up or downwards. Over time and with an increasing number of contacts, it stabilises and becomes more meaningful. While Croatia, Romania and Slovakia have the highest cooperation rates ranging from 89 to 93 percent, Luxembourg and the Netherlands ended up with the lowest cooperation rate (58 and 57 percent).

Figure 6.24 shows panel household retention rates (i.e., the number of panel households with at least one complete interview divided by the total number of (estimated) eligible panel households).

*Figure 6.24: Retention Rate of Panel Households by Country over Time*
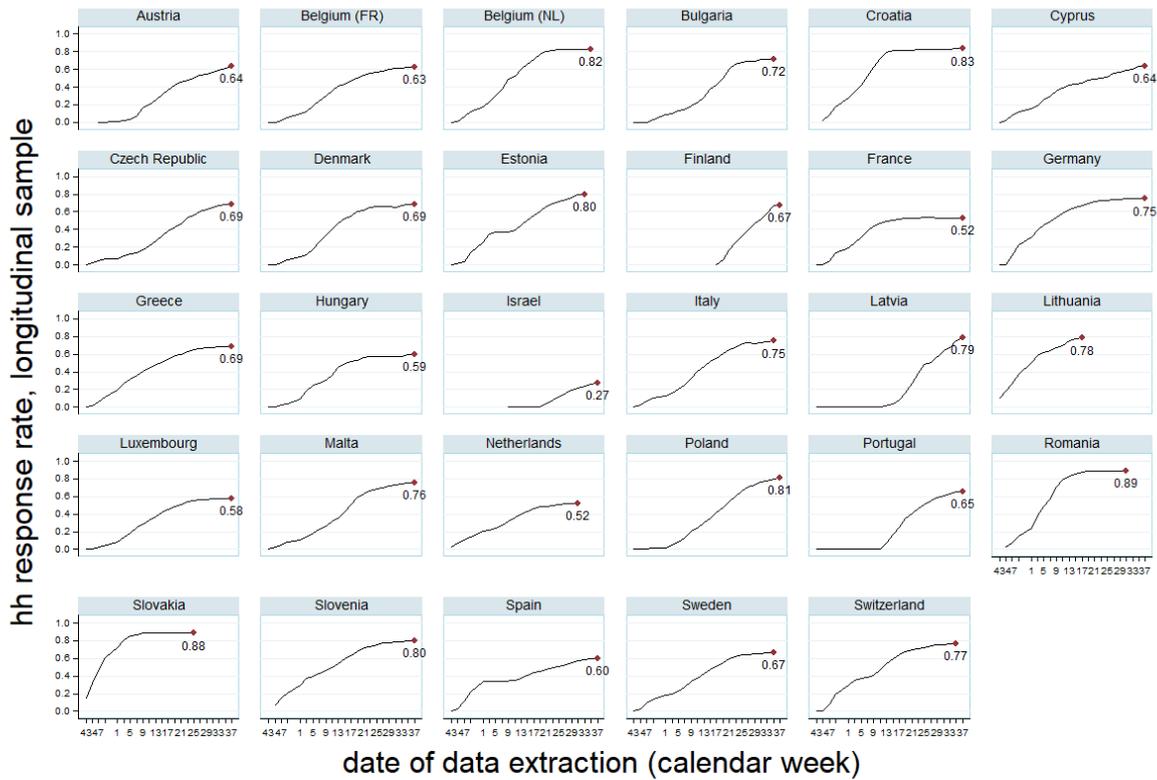
Almost all countries have steadily increasing trajectories that level out over time. The highest retention rates can be seen in Romania and Slovakia (89 and 88 percent). The Netherlands, France and Israel are at the lower end of the range of rates with 52 and 27 percent, the latter mainly due to delays in fieldwork caused by the uncertain COVID-19 situation and many interviewers fearing an infection.

6.5.2.3   Individual Participation of Panel Samples

Figure 6.25: Individual Retention Rates in the Overall Sample by Country over Time
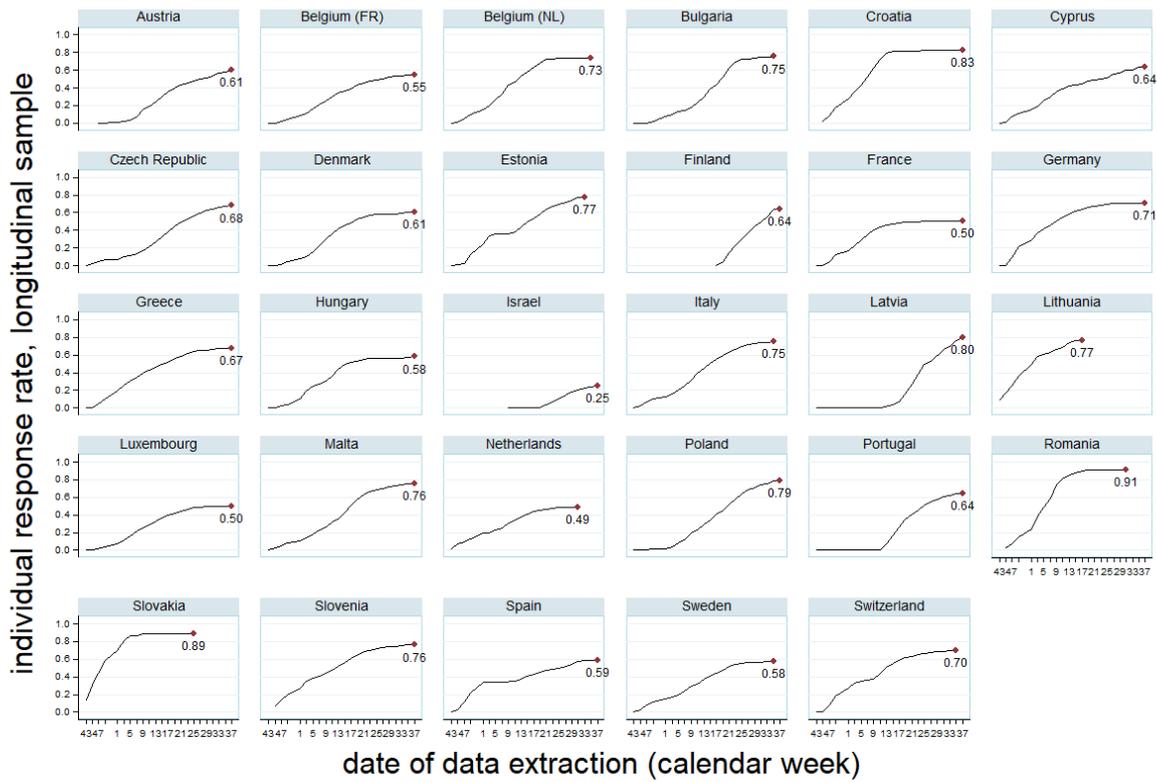
Figure 6.25 shows that only Romania and Slovakia met our target response rate of 85 percent (91 percent and 89 percent, respectively). Croatia came very close to the target response rate with 83 percent.

6.5.2.4 Summary of Panel Samples

Figure 6.26 shows the final household-level contact, cooperation, and retention rates of the panel samples after the end of the regular Wave 9 fieldwork.

Figure 6.26: Contact, Cooperation and Retention Rates for Panel Households
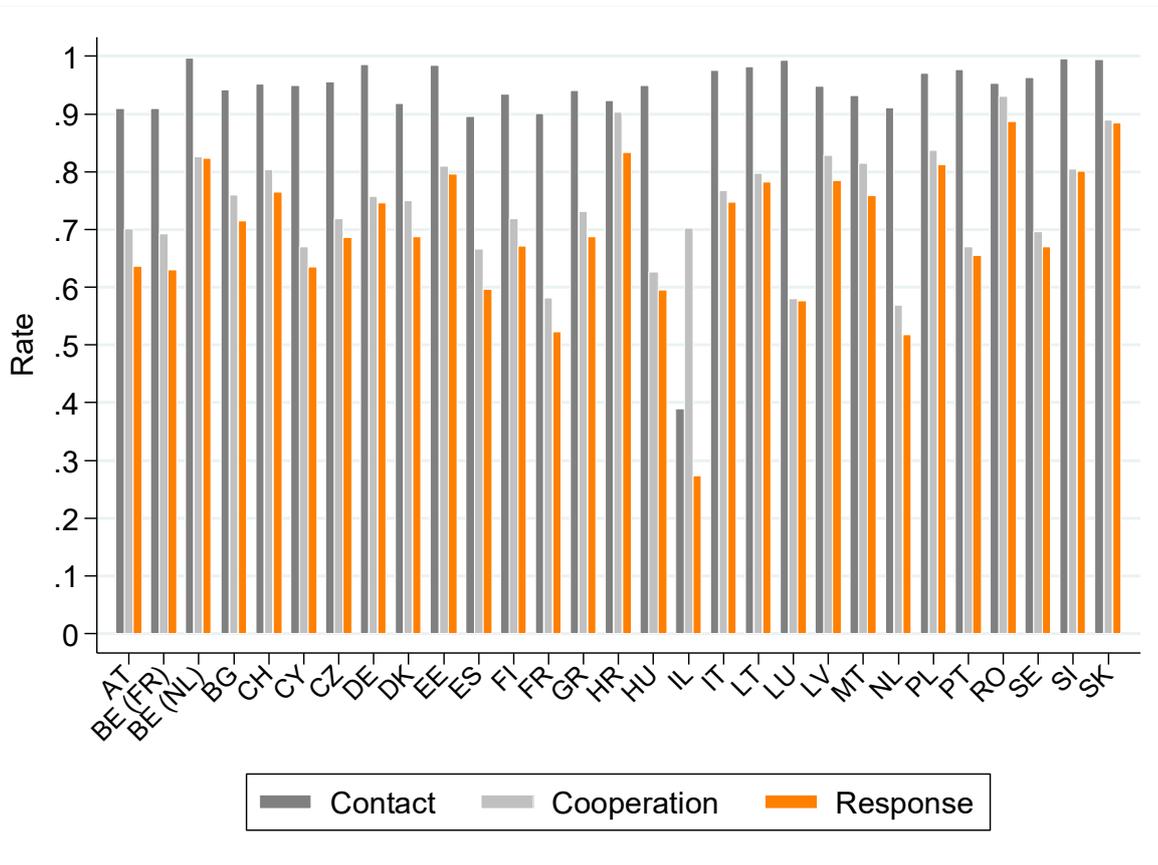
Contact rates are between 90 and 100 percent in most countries. The varying cooperation rates represent the ceiling of the final response/retention rates. For half the countries the final household retention rates range between 70 and 89 percent. Ten countries finalised fieldwork with retention rates between 60 and 70 percent. France, Hungary, Israel, Luxembourg and the Netherlands only reached retention rates below 60 percent. In this respect, it should be noted that variation in rates can, at least partly, be related also to differences in the panel sample composition. Comparisons between countries should therefore take into account when and how often refreshment samples were drawn, but also whether an oversampling of younger cohorts was used, which also affects the age composition of the sample.

Figure 6.27 shows the absolute number of panel interviews per country at the end of regular Wave 9 fieldwork. Detailed breakdowns can be found in the appendix of this chapter.

Figure 6.27: Absolute Numbers of Interviews in Panel Samples
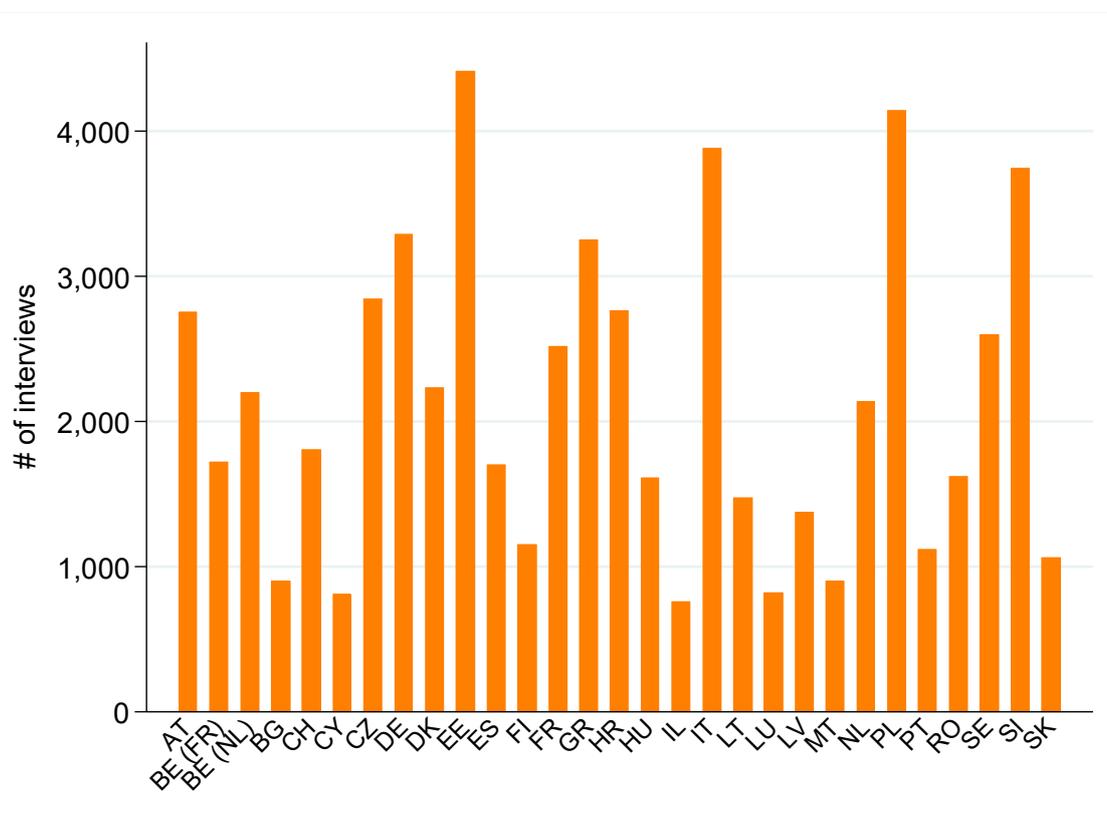
The number of completed interviews also varies with sample size in the longitudinal sample. While Germany, Estonia, Greece, Italy, Poland and Slovenia conducted about 3,000 or more interviews, most other countries finished fieldwork around the mark of 2,000 or less interviews. In a few countries the number of interviews ranges below 1,000 interviews (Bulgaria, Cyprus, Israel, Luxembourg, Malta).

6.6   Conclusion

Despite the exceptional circumstances, fieldwork performance was remarkable in many countries. All survey agencies managed to collect over 72,000 interviews in the regular fieldwork of Wave 9 with the help of roughly 2,000 interviewers across 27 European countries and Israel, pushing the overall numbers to about 160,000 respondents and 515,000 face-to-face interviews. These numbers are augmented with more than 100,000 telephone interviews in the two SHARE Corona Surveys (SCS1+SCS2) done by about 1,000 interviewers.

In Wave 9, SHARE Central benefited more than ever from large gains in efficiency by building on the conceptual framework established before Wave 5, its established software infrastructure, and an effective international cooperation. As usual, we adapted the fieldwork monitoring procedures from previous waves and made some improvements. All numbers and rates are calculated biweekly based on formulas set by AAPOR. This standardised way of computing fieldwork outcomes allows transparency for survey agencies and comparability with other studies.

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APPENDIX A1:

Final Outcomes by Country, SHARE Corona Survey 2 (CATI)

Austria	week 36
Longitudinal sample	
Gross sample:	1929
Households attempted:	1869
Households contacted:	1796
Households estimated to be eligible:	1929.00
Households with completed coverscreen interview:	1660
Households with at least one complete interview:	1647
Percentage of Households attempted:	96.89 %
Contact rate:	93.11 %
Cooperation rate:	91.70 %
Household response rate:	85.38 %
Refusal rate:	3.16 %
Other non-interview rate:	4.56 %
Individual interviews:	2353
Individual response rate:	83.06 %
Median number of attempts for not successfully contacted hh:	3
Number of interviewers in Sample CTRL:	46
Rate of active interviewers:	84.78 %

Belgium (FR)	week 36
Longitudinal sample	
Gross sample:	1301
Households attempted:	1290
Households contacted:	1260
Households estimated to be eligible:	1301.00
Households with completed coverscreen interview:	1139
Households with at least one complete interview:	1132
Percentage of Households attempted:	99.15 %
Contact rate:	96.85 %
Cooperation rate:	89.84 %
Household response rate:	87.01 %
Refusal rate:	5.23 %
Other non-interview rate:	4.61 %
Individual interviews:	1490
Individual response rate:	76.80 %
Median number of attempts for not successfully contacted hh:	8
Number of interviewers in Sample CTRL:	44
Rate of active interviewers:	95.45 %

Belgium (NL)	week 36
Longitudinal sample	
Gross sample:	1565
Households attempted:	1565
Households contacted:	1551
Households estimated to be eligible:	1565.00
Households with completed coverscreen interview:	1459
Households with at least one complete interview:	1447
Percentage of Households attempted:	100.00 %
Contact rate:	99.11 %
Cooperation rate:	93.29 %
Household response rate:	92.46 %
Refusal rate:	4.86 %
Other non-interview rate:	1.79 %
Individual interviews:	2069
Individual response rate:	83.56 %
Median number of attempts for not successfully contacted hh:	8
Number of interviewers in Sample CTRL:	39
Rate of active interviewers:	100.00 %

Bulgaria	week 36
Longitudinal sample	
Gross sample:	573
Households attempted:	573
Households contacted:	573
Households estimated to be eligible:	573.00
Households with completed coverscreen interview:	486
Households with at least one complete interview:	483
Percentage of Households attempted:	100.00 %
Contact rate:	100.00 %
Cooperation rate:	84.29 %
Household response rate:	84.29 %
Refusal rate:	5.41 %
Other non-interview rate:	10.30 %
Individual interviews:	725
Individual response rate:	83.62 %
Median number of attempts for not successfully contacted hh:	.
Number of interviewers in Sample CTRL:	18
Rate of active interviewers:	61.11 %

Switzerland	week 36
Longitudinal sample	
Gross sample:	1375
Households attempted:	1375
Households contacted:	1350
Households estimated to be eligible:	1375.00
Households with completed coverscreen interview:	1279
Households with at least one complete interview:	1271
Percentage of Households attempted:	100.00 %
Contact rate:	98.18 %
Cooperation rate:	94.15 %
Household response rate:	92.44 %
Refusal rate:	3.56 %
Other non-interview rate:	2.18 %
Individual interviews:	1778
Individual response rate:	82.89 %
Median number of attempts for not successfully contacted hh:	10
Number of interviewers in Sample CTRL:	64
Rate of active interviewers:	96.88 %

Cyprus	week 36
Longitudinal sample	
Gross sample:	544
Households attempted:	542
Households contacted:	520
Households estimated to be eligible:	544.00
Households with completed coverscreen interview:	422
Households with at least one complete interview:	410
Percentage of Households attempted:	99.63 %
Contact rate:	95.59 %
Cooperation rate:	78.85 %
Household response rate:	75.37 %
Refusal rate:	9.74 %
Other non-interview rate:	10.48 %
Individual interviews:	660
Individual response rate:	73.25 %
Median number of attempts for not successfully contacted hh:	8
Number of interviewers in Sample CTRL:	10
Rate of active interviewers:	100.00 %

Czech Republic	week 36
Longitudinal sample	
Gross sample:	1829
Households attempted:	1828
Households contacted:	1766
Households estimated to be eligible:	1829.00
Households with completed coverscreen interview:	1487
Households with at least one complete interview:	1481
Percentage of Households attempted:	99.95 %
Contact rate:	96.56 %
Cooperation rate:	83.86 %
Household response rate:	80.97 %
Refusal rate:	7.16 %
Other non-interview rate:	8.42 %
Individual interviews:	2157
Individual response rate:	78.95 %
Median number of attempts for not successfully contacted hh:	5
Number of interviewers in Sample CTRL:	15
Rate of active interviewers:	86.67 %

Germany	week 36
Longitudinal sample	
Gross sample:	1440
Households attempted:	1438
Households contacted:	1429
Households estimated to be eligible:	1440.00
Households with completed coverscreen interview:	1344
Households with at least one complete interview:	1331
Percentage of Households attempted:	99.86 %
Contact rate:	99.24 %
Cooperation rate:	93.14 %
Household response rate:	92.43 %
Refusal rate:	3.61 %
Other non-interview rate:	3.19 %
Individual interviews:	2085
Individual response rate:	90.53 %
Median number of attempts for not successfully contacted hh:	8
Number of interviewers in Sample CTRL:	91
Rate of active interviewers:	101.10 %

Denmark	week 36
Longitudinal sample	
Gross sample:	1461
Households attempted:	1409
Households contacted:	1343
Households estimated to be eligible:	1461.00
Households with completed coverscreen interview:	1120
Households with at least one complete interview:	1111
Percentage of Households attempted:	96.44 %
Contact rate:	91.92 %
Cooperation rate:	82.73 %
Household response rate:	76.04 %
Refusal rate:	10.34 %
Other non-interview rate:	5.54 %
Individual interviews:	1592
Individual response rate:	66.58 %
Median number of attempts for not successfully contacted hh:	4
Number of interviewers in Sample CTRL:	45
Rate of active interviewers:	88.89 %

Estonia	week 36
Longitudinal sample	
Gross sample:	3305
Households attempted:	3275
Households contacted:	3237
Households estimated to be eligible:	3305.00
Households with completed coverscreen interview:	3006
Households with at least one complete interview:	2989
Percentage of Households attempted:	99.09 %
Contact rate:	97.94 %
Cooperation rate:	92.34 %
Household response rate:	90.44 %
Refusal rate:	4.81 %
Other non-interview rate:	2.69 %
Individual interviews:	4193
Individual response rate:	89.02 %
Median number of attempts for not successfully contacted hh:	7
Number of interviewers in Sample CTRL:	33
Rate of active interviewers:	90.91 %

Spain	week 36
Longitudinal sample	
Gross sample:	1407
Households attempted:	1398
Households contacted:	1358
Households estimated to be eligible:	1407.00
Households with completed coverscreen interview:	1225
Households with at least one complete interview:	1200
Percentage of Households attempted:	99.36 %
Contact rate:	96.52 %
Cooperation rate:	88.37 %
Household response rate:	85.29 %
Refusal rate:	2.91 %
Other non-interview rate:	8.32 %
Individual interviews:	1877
Individual response rate:	85.94 %
Median number of attempts for not successfully contacted hh:	27
Number of interviewers in Sample CTRL:	30
Rate of active interviewers:	100.00 %

Finland	week 36
Longitudinal sample	
Gross sample:	941
Households attempted:	934
Households contacted:	923
Households estimated to be eligible:	941.00
Households with completed coverscreen interview:	851
Households with at least one complete interview:	844
Percentage of Households attempted:	99.26 %
Contact rate:	98.09 %
Cooperation rate:	91.44 %
Household response rate:	89.69 %
Refusal rate:	5.31 %
Other non-interview rate:	3.08 %
Individual interviews:	1326
Individual response rate:	86.27 %
Median number of attempts for not successfully contacted hh:	11
Number of interviewers in Sample CTRL:	28
Rate of active interviewers:	100.00 %

France	week 36
Longitudinal sample	
Gross sample:	1524
Households attempted:	1519
Households contacted:	1465
Households estimated to be eligible:	1524.00
Households with completed coverscreen interview:	1346
Households with at least one complete interview:	1335
Percentage of Households attempted:	99.67 %
Contact rate:	96.13 %
Cooperation rate:	91.13 %
Household response rate:	87.60 %
Refusal rate:	3.87 %
Other non-interview rate:	4.66 %
Individual interviews:	1887
Individual response rate:	82.76 %
Median number of attempts for not successfully contacted hh:	10
Number of interviewers in Sample CTRL:	53
Rate of active interviewers:	100.00 %

Greece	week 36
Longitudinal sample	
Gross sample:	2483
Households attempted:	2439
Households contacted:	2382
Households estimated to be eligible:	2483.00
Households with completed coverscreen interview:	2215
Households with at least one complete interview:	2207
Percentage of Households attempted:	98.23 %
Contact rate:	95.93 %
Cooperation rate:	92.65 %
Household response rate:	88.88 %
Refusal rate:	4.03 %
Other non-interview rate:	3.02 %
Individual interviews:	3455
Individual response rate:	88.16 %
Median number of attempts for not successfully contacted hh:	1
Number of interviewers in Sample CTRL:	97
Rate of active interviewers:	94.85 %

Croatia	week 36
Longitudinal sample	
Gross sample:	1351
Households attempted:	1329
Households contacted:	1281
Households estimated to be eligible:	1351.00
Households with completed coverscreen interview:	1229
Households with at least one complete interview:	1216
Percentage of Households attempted:	98.37 %
Contact rate:	94.82 %
Cooperation rate:	94.93 %
Household response rate:	90.01 %
Refusal rate:	2.89 %
Other non-interview rate:	1.92 %
Individual interviews:	1971
Individual response rate:	90.91 %
Median number of attempts for not successfully contacted hh:	3
Number of interviewers in Sample CTRL:	45
Rate of active interviewers:	97.78 %

Hungary	week 36
Longitudinal sample	
Gross sample:	704
Households attempted:	686
Households contacted:	678
Households estimated to be eligible:	704.00
Households with completed coverscreen interview:	608
Households with at least one complete interview:	591
Percentage of Households attempted:	97.44 %
Contact rate:	96.31 %
Cooperation rate:	87.17 %
Household response rate:	83.95 %
Refusal rate:	6.39 %
Other non-interview rate:	5.97 %
Individual interviews:	893
Individual response rate:	82.08 %
Median number of attempts for not successfully contacted hh:	1
Number of interviewers in Sample CTRL:	34
Rate of active interviewers:	97.06 %

Israel	week 36
Longitudinal sample	
Gross sample:	1068
Households attempted:	1043
Households contacted:	1021
Households estimated to be eligible:	1068.00
Households with completed coverscreen interview:	912
Households with at least one complete interview:	902
Percentage of Households attempted:	97.66 %
Contact rate:	95.60 %
Cooperation rate:	88.34 %
Household response rate:	84.46 %
Refusal rate:	7.02 %
Other non-interview rate:	4.12 %
Individual interviews:	1328
Individual response rate:	78.86 %
Median number of attempts for not successfully contacted hh:	5
Number of interviewers in Sample CTRL:	11
Rate of active interviewers:	100.00 %

Italy	week 36
Longitudinal sample	
Gross sample:	2424
Households attempted:	2424
Households contacted:	2383
Households estimated to be eligible:	2424.00
Households with completed coverscreen interview:	2153
Households with at least one complete interview:	2135
Percentage of Households attempted:	100.00 %
Contact rate:	98.31 %
Cooperation rate:	89.59 %
Household response rate:	88.08 %
Refusal rate:	4.99 %
Other non-interview rate:	5.24 %
Individual interviews:	3456
Individual response rate:	86.94 %
Median number of attempts for not successfully contacted hh:	11
Number of interviewers in Sample CTRL:	122
Rate of active interviewers:	96.72 %

Lithuania	week 36
Longitudinal sample	
Gross sample:	946
Households attempted:	944
Households contacted:	936
Households estimated to be eligible:	946.00
Households with completed coverscreen interview:	908
Households with at least one complete interview:	906
Percentage of Households attempted:	99.79 %
Contact rate:	98.94 %
Cooperation rate:	96.79 %
Household response rate:	95.77 %
Refusal rate:	1.06 %
Other non-interview rate:	2.11 %
Individual interviews:	1296
Individual response rate:	94.53 %
Median number of attempts for not successfully contacted hh:	11
Number of interviewers in Sample CTRL:	35
Rate of active interviewers:	97.14 %

Luxembourg	week 36
Longitudinal sample	
Gross sample:	647
Households attempted:	647
Households contacted:	642
Households estimated to be eligible:	647.00
Households with completed coverscreen interview:	591
Households with at least one complete interview:	588
Percentage of Households attempted:	100.00 %
Contact rate:	99.23 %
Cooperation rate:	91.59 %
Household response rate:	90.88 %
Refusal rate:	5.87 %
Other non-interview rate:	2.47 %
Individual interviews:	879
Individual response rate:	81.24 %
Median number of attempts for not successfully contacted hh:	9
Number of interviewers in Sample CTRL:	18
Rate of active interviewers:	105.56 %

Latvia	week 36
Longitudinal sample	
Gross sample:	737
Households attempted:	737
Households contacted:	730
Households estimated to be eligible:	737.00
Households with completed coverscreen interview:	699
Households with at least one complete interview:	697
Percentage of Households attempted:	100.00 %
Contact rate:	99.05 %
Cooperation rate:	95.48 %
Household response rate:	94.57 %
Refusal rate:	1.76 %
Other non-interview rate:	2.71 %
Individual interviews:	1003
Individual response rate:	94.80 %
Median number of attempts for not successfully contacted hh:	13
Number of interviewers in Sample CTRL:	21
Rate of active interviewers:	95.24 %

Malta	week 36
Longitudinal sample	
Gross sample:	561
Households attempted:	556
Households contacted:	551
Households estimated to be eligible:	561.00
Households with completed coverscreen interview:	485
Households with at least one complete interview:	484
Percentage of Households attempted:	99.11 %
Contact rate:	98.22 %
Cooperation rate:	87.84 %
Household response rate:	86.27 %
Refusal rate:	9.80 %
Other non-interview rate:	2.14 %
Individual interviews:	808
Individual response rate:	85.59 %
Median number of attempts for not successfully contacted hh:	17
Number of interviewers in Sample CTRL:	10
Rate of active interviewers:	90.00 %

Netherlands	week 36
Longitudinal sample	
Gross sample:	549
Households attempted:	546
Households contacted:	536
Households estimated to be eligible:	549.00
Households with completed coverscreen interview:	485
Households with at least one complete interview:	483
Percentage of Households attempted:	99.45 %
Contact rate:	97.63 %
Cooperation rate:	90.11 %
Household response rate:	87.98 %
Refusal rate:	5.46 %
Other non-interview rate:	4.19 %
Individual interviews:	739
Individual response rate:	84.55 %
Median number of attempts for not successfully contacted hh:	11
Number of interviewers in Sample CTRL:	26
Rate of active interviewers:	96.15 %

Poland	week 36
Longitudinal sample	
Gross sample:	2045
Households attempted:	2038
Households contacted:	1974
Households estimated to be eligible:	2045.00
Households with completed coverscreen interview:	1866
Households with at least one complete interview:	1843
Percentage of Households attempted:	99.66 %
Contact rate:	96.53 %
Cooperation rate:	93.36 %
Household response rate:	90.12 %
Refusal rate:	1.71 %
Other non-interview rate:	4.69 %
Individual interviews:	2896
Individual response rate:	87.81 %
Median number of attempts for not successfully contacted hh:	6
Number of interviewers in Sample CTRL:	47
Rate of active interviewers:	89.36 %

Portugal	week 36
Longitudinal sample	
Gross sample:	748
Households attempted:	747
Households contacted:	734
Households estimated to be eligible:	748.00
Households with completed coverscreen interview:	689
Households with at least one complete interview:	685
Percentage of Households attempted:	99.87 %
Contact rate:	98.13 %
Cooperation rate:	93.32 %
Household response rate:	91.58 %
Refusal rate:	3.48 %
Other non-interview rate:	3.07 %
Individual interviews:	1085
Individual response rate:	89.60 %
Median number of attempts for not successfully contacted hh:	11
Number of interviewers in Sample CTRL:	21
Rate of active interviewers:	104.76 %

Romania	week 36
Longitudinal sample	
Gross sample:	1023
Households attempted:	1009
Households contacted:	1001
Households estimated to be eligible:	1023.00
Households with completed coverscreen interview:	987
Households with at least one complete interview:	965
Percentage of Households attempted:	98.63 %
Contact rate:	97.85 %
Cooperation rate:	96.40 %
Household response rate:	94.33 %
Refusal rate:	0.98 %
Other non-interview rate:	2.54 %
Individual interviews:	1539
Individual response rate:	95.77 %
Median number of attempts for not successfully contacted hh:	2
Number of interviewers in Sample CTRL:	34
Rate of active interviewers:	91.18 %

Sweden	week 36
Longitudinal sample	
Gross sample:	871
Households attempted:	862
Households contacted:	818
Households estimated to be eligible:	871.00
Households with completed coverscreen interview:	687
Households with at least one complete interview:	682
Percentage of Households attempted:	98.97 %
Contact rate:	93.92 %
Cooperation rate:	83.37 %
Household response rate:	78.30 %
Refusal rate:	10.22 %
Other non-interview rate:	5.40 %
Individual interviews:	963
Individual response rate:	69.73 %
Median number of attempts for not successfully contacted hh:	8
Number of interviewers in Sample CTRL:	22
Rate of active interviewers:	95.45 %

Slovenia	week 36
Longitudinal sample	
Gross sample:	2127
Households attempted:	2125
Households contacted:	2107
Households estimated to be eligible:	2127.00
Households with completed coverscreen interview:	1981
Households with at least one complete interview:	1970
Percentage of Households attempted:	99.91 %
Contact rate:	99.06 %
Cooperation rate:	93.50 %
Household response rate:	92.62 %
Refusal rate:	4.00 %
Other non-interview rate:	2.44 %
Individual interviews:	3042
Individual response rate:	90.94 %
Median number of attempts for not successfully contacted hh:	11
Number of interviewers in Sample CTRL:	49
Rate of active interviewers:	93.88 %

Slovakia	week 36
Longitudinal sample	
Gross sample:	620
Households attempted:	602
Households contacted:	598
Households estimated to be eligible:	620.00
Households with completed coverscreen interview:	595
Households with at least one complete interview:	585
Percentage of Households attempted:	97.10 %
Contact rate:	96.45 %
Cooperation rate:	97.83 %
Household response rate:	94.35 %
Refusal rate:	1.77 %
Other non-interview rate:	0.32 %
Individual interviews:	945
Individual response rate:	94.78 %
Median number of attempts for not successfully contacted hh:	1
Number of interviewers in Sample CTRL:	37
Rate of active interviewers:	94.59 %

APPENDIX A2:

Final Outcomes by Country, SHARE Main Wave 9 (Panel and Refreshment, CAPI)

Austria	week 37
Baseline / refreshment sample	
Gross sample:	4191
Eligible households:	3922
Ineligible households:	269
Households with unknown eligibility:	0
Households attempted:	3259
Households contacted:	2894
Estimated proportion of eligible households:	93.58 %
Households estimated to be eligible:	3922.00
Households with completed coverscreen interview:	708
Households with at least one complete interview:	693
Percentage of Households attempted:	77.76 %
Contact rate:	66.93 %
Cooperation rate:	26.40 %
Household response rate:	17.67 %
Household response rate (only based on attempted HH):	17.67 %
Refusal rate:	42.40 %
Other non-interview rate:	6.86 %
Individual interviews:	907
Estimated average number of eligibles in hh:	1.10
Individual response rate:	20.96 %
Median number of attempts for not successfully contacted hh:	3
Longitudinal sample	
Gross sample:	3124
Eligible households:	3109
Ineligible households:	15
Households with unknown eligibility:	0
Households attempted:	2933
Households contacted:	2841
Estimated proportion of eligible households:	99.52 %
Households estimated to be eligible:	3109.00
Households with completed coverscreen interview:	1994
Households with at least one complete interview:	1980
Percentage of Households attempted:	93.89 %

Contact rate:	90.90 %
Cooperation rate:	70.06 %
Household response rate:	63.69 %
Household response rate (only based on attempted HH):	63.69 %
Refusal rate:	17.69 %
Other non-interview rate:	9.52 %
Individual interviews:	2755
Individual response rate:	60.76 %
Median number of attempts for not successfully contacted hh:	3
Number of interviewers in Sample CTRL:	73
Number of interviewers who have synched*	68

Belgium (FR)	week 37
Baseline / refreshment sample	
Gross sample:	1952
Eligible households:	1737
Ineligible households:	214
Households with unknown eligibility:	0
Households attempted:	1607
Households contacted:	1394
Estimated proportion of eligible households:	89.03 %
Households estimated to be eligible:	1737.00
Households with completed coverscreen interview:	362
Households with at least one complete interview:	352
Percentage of Households attempted:	82.33 %
Contact rate:	67.88 %
Cooperation rate:	29.86 %
Household response rate:	20.26 %
Household response rate (only based on attempted HH):	20.26 %
Refusal rate:	41.05 %
Other non-interview rate:	6.56 %
Individual interviews:	416
Estimated average number of eligibles in hh:	1.09
Individual response rate:	21.93 %
Median number of attempts for not successfully contacted hh:	2
Longitudinal sample	
Gross sample:	2152
Eligible households:	2143
Ineligible households:	9
Households with unknown eligibility:	0
Households attempted:	2046

Households contacted:	1958
Estimated proportion of eligible households:	99.58 %
Households estimated to be eligible:	2143.00
Households with completed coverscreen interview:	1364
Households with at least one complete interview:	1349
Percentage of Households attempted:	95.07 %
Contact rate:	90.95 %
Cooperation rate:	69.21 %
Household response rate:	62.95 %
Household response rate (only based on attempted HH):	62.95 %
Refusal rate:	18.71 %
Other non-interview rate:	9.29 %
Individual interviews:	1720
Individual response rate:	54.71 %
Median number of attempts for not successfully contacted hh:	5
Number of interviewers in Sample CTRL:	74
Number of interviewers who have synched*	64

Belgium (NL)	week 37
Baseline / refreshment sample	
Gross sample:	805
Eligible households:	712
Ineligible households:	93
Households with unknown eligibility:	0
Households attempted:	805
Households contacted:	791
Estimated proportion of eligible households:	88.45 %
Households estimated to be eligible:	712.00
Households with completed coverscreen interview:	228
Households with at least one complete interview:	224
Percentage of Households attempted:	100.00 %
Contact rate:	98.03 %
Cooperation rate:	32.09 %
Household response rate:	31.46 %
Household response rate (only based on attempted HH):	31.46 %
Refusal rate:	64.33 %
Other non-interview rate:	2.25 %
Individual interviews:	278
Estimated average number of eligibles in hh:	1.19
Individual response rate:	32.86 %
Median number of attempts for not successfully contacted hh:	9

Longitudinal sample	
Gross sample:	1934
Eligible households:	1926
Ineligible households:	8
Households with unknown eligibility:	0
Households attempted:	1932
Households contacted:	1927
Estimated proportion of eligible households:	99.59 %
Households estimated to be eligible:	1926.00
Households with completed coverscreen interview:	1594
Households with at least one complete interview:	1585
Percentage of Households attempted:	99.90 %
Contact rate:	99.64 %
Cooperation rate:	82.60 %
Household response rate:	82.29 %
Household response rate (only based on attempted HH):	82.29 %
Refusal rate:	14.23 %
Other non-interview rate:	3.12 %
Individual interviews:	2201
Individual response rate:	73.46 %
Median number of attempts for not successfully contacted hh:	15
Number of interviewers in Sample CTRL:	50
Number of interviewers who have synched*	48

Bulgaria	**week 37**
Longitudinal sample	
Gross sample:	834
Eligible households:	822
Ineligible households:	11
Households with unknown eligibility:	0
Households attempted:	812
Households contacted:	786
Estimated proportion of eligible households:	98.68 %
Households estimated to be eligible:	822.00
Households with completed coverscreen interview:	626
Households with at least one complete interview:	588
Percentage of Households attempted:	97.36 %
Contact rate:	94.16 %
Cooperation rate:	75.97 %
Household response rate:	71.53 %
Household response rate (only based on attempted HH):	71.53 %
Refusal rate:	11.68 %
Other non-interview rate:	10.95 %

Individual interviews:	902
Individual response rate:	75.36 %
Median number of attempts for not successfully contacted hh:	5
Number of interviewers in Sample CTRL:	46
Number of interviewers who have synched*	33

Switzerland	week 37
Baseline / refreshment sample	
Gross sample:	373
Eligible households:	316
Ineligible households:	57
Households with unknown eligibility:	0
Households attempted:	351
Households contacted:	309
Estimated proportion of eligible households:	84.72 %
Households estimated to be eligible:	316.00
Households with completed coverscreen interview:	71
Households with at least one complete interview:	71
Percentage of Households attempted:	94.10 %
Contact rate:	79.75 %
Cooperation rate:	28.17 %
Household response rate:	22.47 %
Household response rate (only based on attempted HH):	22.47 %
Refusal rate:	43.99 %
Other non-interview rate:	13.29 %
Individual interviews:	80
Estimated average number of eligibles in hh:	1.11
Individual response rate:	22.79 %
Median number of attempts for not successfully contacted hh:	5
Longitudinal sample	
Gross sample:	1711
Eligible households:	1698
Ineligible households:	12
Households with unknown eligibility:	0
Households attempted:	1657
Households contacted:	1630
Estimated proportion of eligible households:	99.30 %
Households estimated to be eligible:	1698.00
Households with completed coverscreen interview:	1307
Households with at least one complete interview:	1299
Percentage of Households attempted:	96.84 %
Contact rate:	95.23 %

Cooperation rate:	80.33 %
Household response rate:	76.50 %
Household response rate (only based on attempted HH):	76.50 %
Refusal rate:	12.78 %
Other non-interview rate:	5.95 %
Individual interviews:	1805
Individual response rate:	70.22 %
Median number of attempts for not successfully contacted hh:	5
Number of interviewers in Sample CTRL:	76
Number of interviewers who have synched*	55

Cyprus	week 37
Longitudinal sample	
Gross sample:	793
Eligible households:	790
Ineligible households:	3
Households with unknown eligibility:	0
Households attempted:	777
Households contacted:	753
Estimated proportion of eligible households:	99.62 %
Households estimated to be eligible:	790.00
Households with completed coverscreen interview:	511
Households with at least one complete interview:	502
Percentage of Households attempted:	97.98 %
Contact rate:	94.94 %
Cooperation rate:	66.93 %
Household response rate:	63.54 %
Household response rate (only based on attempted HH):	63.54 %
Refusal rate:	19.24 %
Other non-interview rate:	12.15 %
Individual interviews:	814
Individual response rate:	63.74 %
Median number of attempts for not successfully contacted hh:	5
Number of interviewers in Sample CTRL:	18
Number of interviewers who have synched*	17

Czech Republic	week 37
Baseline / refreshment sample	
Gross sample:	5441
Eligible households:	1493
Ineligible households:	695
Households with unknown eligibility:	3253
Households attempted:	2457
Households contacted:	2182
Estimated proportion of eligible households:	68.24 %
Households estimated to be eligible:	3712.71
Households with completed coverscreen interview:	538
Households with at least one complete interview:	514
Percentage of Households attempted:	45.16 %
Contact rate:	36.31 %
Cooperation rate:	38.13 %
Household response rate:	13.84 %
Household response rate (only based on attempted HH):	34.43 %
Refusal rate:	17.86 %
Other non-interview rate:	4.61 %
Individual interviews:	702
Estimated average number of eligibles in hh:	1.46
Individual response rate:	12.99 %
Median number of attempts for not successfully contacted hh:	0
Longitudinal sample	
Gross sample:	2926
Eligible households:	2907
Ineligible households:	16
Households with unknown eligibility:	0
Households attempted:	2845
Households contacted:	2796
Estimated proportion of eligible households:	99.45 %
Households estimated to be eligible:	2907.00
Households with completed coverscreen interview:	2018
Households with at least one complete interview:	1994
Percentage of Households attempted:	97.23 %
Contact rate:	95.53 %
Cooperation rate:	71.80 %
Household response rate:	68.59 %
Household response rate (only based on attempted HH):	68.59 %
Refusal rate:	12.83 %
Other non-interview rate:	14.10 %

Individual interviews:	2843
Individual response rate:	67.83 %
Median number of attempts for not successfully contacted hh:	1
Number of interviewers in Sample CTRL:	95
Number of interviewers who have synched*	83

Germany	week 37
Baseline / refreshment sample	
Gross sample:	6520
Eligible households:	5582
Ineligible households:	938
Households with unknown eligibility:	0
Households attempted:	6192
Households contacted:	5546
Estimated proportion of eligible households:	85.61 %
Households estimated to be eligible:	5582.00
Households with completed coverscreen interview:	1008
Households with at least one complete interview:	964
Percentage of Households attempted:	94.97 %
Contact rate:	82.55 %
Cooperation rate:	20.92 %
Household response rate:	17.27 %
Household response rate (only based on attempted HH):	17.27 %
Refusal rate:	57.92 %
Other non-interview rate:	7.36 %
Individual interviews:	1240
Estimated average number of eligibles in hh:	1.12
Individual response rate:	19.87 %
Median number of attempts for not successfully contacted hh:	2
Longitudinal sample	
Gross sample:	2985
Eligible households:	2976
Ineligible households:	7
Households with unknown eligibility:	0
Households attempted:	2957
Households contacted:	2943
Estimated proportion of eligible households:	99.77 %
Households estimated to be eligible:	2976.00
Households with completed coverscreen interview:	2237
Households with at least one complete interview:	2220
Percentage of Households attempted:	99.06 %

Contact rate:	98.59 %
Cooperation rate:	75.66 %
Household response rate:	74.60 %
Household response rate (only based on attempted HH):	74.60 %
Refusal rate:	17.27 %
Other non-interview rate:	6.72 %
Individual interviews:	3289
Individual response rate:	70.66 %
Median number of attempts for not successfully contacted hh:	4
Number of interviewers in Sample CTRL:	168
Number of interviewers who have synched*	160

Denmark	week 37
Baseline / refreshment sample	
Gross sample:	267
Eligible households:	262
Ineligible households:	5
Households with unknown eligibility:	0
Households attempted:	257
Households contacted:	231
Estimated proportion of eligible households:	98.13 %
Households estimated to be eligible:	262.00
Households with completed coverscreen interview:	75
Households with at least one complete interview:	71
Percentage of Households attempted:	96.25 %
Contact rate:	86.26 %
Cooperation rate:	31.42 %
Household response rate:	27.10 %
Household response rate (only based on attempted HH):	27.10 %
Refusal rate:	52.67 %
Other non-interview rate:	6.49 %
Individual interviews:	87
Estimated average number of eligibles in hh:	1.18
Individual response rate:	28.25 %
Median number of attempts for not successfully contacted hh:	4
Longitudinal sample	
Gross sample:	2355
Eligible households:	2352
Ineligible households:	2
Households with unknown eligibility:	0
Households attempted:	2217

Households contacted:	2161
Estimated proportion of eligible households:	99.92 %
Households estimated to be eligible:	2352.00
Households with completed coverscreen interview:	1654
Households with at least one complete interview:	1617
Percentage of Households attempted:	94.14 %
Contact rate:	91.75 %
Cooperation rate:	74.93 %
Household response rate:	68.75 %
Household response rate (only based on attempted HH):	68.75 %
Refusal rate:	18.49 %
Other non-interview rate:	4.51 %
Individual interviews:	2233
Individual response rate:	60.55 %
Median number of attempts for not successfully contacted hh:	4
Number of interviewers in Sample CTRL:	113
Number of interviewers who have synched*	95

Estonia	week 37
Baseline / refreshment sample	
Gross sample:	708
Eligible households:	662
Ineligible households:	46
Households with unknown eligibility:	0
Households attempted:	699
Households contacted:	644
Estimated proportion of eligible households:	93.50 %
Households estimated to be eligible:	662.00
Households with completed coverscreen interview:	287
Households with at least one complete interview:	279
Percentage of Households attempted:	98.73 %
Contact rate:	90.33 %
Cooperation rate:	46.66 %
Household response rate:	42.15 %
Household response rate (only based on attempted HH):	42.15 %
Refusal rate:	40.03 %
Other non-interview rate:	8.16 %
Individual interviews:	360
Estimated average number of eligibles in hh:	1.18
Individual response rate:	46.04 %
Median number of attempts for not successfully contacted hh:	7

Longitudinal sample	
Gross sample:	4097
Eligible households:	4064
Ineligible households:	25
Households with unknown eligibility:	0
Households attempted:	4080
Households contacted:	4031
Estimated proportion of eligible households:	99.39 %
Households estimated to be eligible:	4064.00
Households with completed coverscreen interview:	3255
Households with at least one complete interview:	3236
Percentage of Households attempted:	99.59 %
Contact rate:	98.38 %
Cooperation rate:	80.94 %
Household response rate:	79.63 %
Household response rate (only based on attempted HH):	79.63 %
Refusal rate:	13.71 %
Other non-interview rate:	5.04 %
Individual interviews:	4413
Individual response rate:	77.29 %
Median number of attempts for not successfully contacted hh:	6
Number of interviewers in Sample CTRL:	99
Number of interviewers who have synched*	95

Spain	week 37
Baseline / refreshment sample	
Gross sample:	2502
Eligible households:	2016
Ineligible households:	485
Households with unknown eligibility:	0
Households attempted:	2268
Households contacted:	1792
Estimated proportion of eligible households:	80.61 %
Households estimated to be eligible:	2016.00
Households with completed coverscreen interview:	400
Households with at least one complete interview:	368
Percentage of Households attempted:	90.65 %
Contact rate:	64.78 %
Cooperation rate:	28.18 %
Household response rate:	18.25 %
Household response rate (only based on attempted HH):	18.25 %
Refusal rate:	29.91 %

Other non-interview rate:	16.62 %
Individual interviews:	489
Estimated average number of eligibles in hh:	1.10
Individual response rate:	22.11 %
Median number of attempts for not successfully contacted hh:	3
Longitudinal sample	
Gross sample:	1925
Eligible households:	1909
Ineligible households:	11
Households with unknown eligibility:	0
Households attempted:	1822
Households contacted:	1725
Estimated proportion of eligible households:	99.43 %
Households estimated to be eligible:	1909.00
Households with completed coverscreen interview:	1187
Households with at least one complete interview:	1138
Percentage of Households attempted:	94.65 %
Contact rate:	89.52 %
Cooperation rate:	66.59 %
Household response rate:	59.61 %
Household response rate (only based on attempted HH):	59.61 %
Refusal rate:	16.61 %
Other non-interview rate:	13.31 %
Individual interviews:	1704
Individual response rate:	59.03 %
Median number of attempts for not successfully contacted hh:	7
Number of interviewers in Sample CTRL:	89
Number of interviewers who have synched*	75

Finland	week 37
Baseline / refreshment sample	
Gross sample:	2100
Eligible households:	1974
Ineligible households:	126
Households with unknown eligibility:	0
Households attempted:	1997
Households contacted:	1779
Estimated proportion of eligible households:	94.00 %
Households estimated to be eligible:	1974.00
Households with completed coverscreen interview:	512
Households with at least one complete interview:	503

Percentage of Households attempted:	95.10 %
Contact rate:	83.74 %
Cooperation rate:	30.43 %
Household response rate:	25.48 %
Household response rate (only based on attempted HH):	25.48 %
Refusal rate:	40.32 %
Other non-interview rate:	17.93 %
Individual interviews:	607
Estimated average number of eligibles in hh:	1.12
Individual response rate:	27.40 %
Median number of attempts for not successfully contacted hh:	2
Longitudinal sample	
Gross sample:	1135
Eligible households:	1130
Ineligible households:	5
Households with unknown eligibility:	0
Households attempted:	1128
Households contacted:	1061
Estimated proportion of eligible households:	99.56 %
Households estimated to be eligible:	1130.00
Households with completed coverscreen interview:	766
Households with at least one complete interview:	759
Percentage of Households attempted:	99.38 %
Contact rate:	93.45 %
Cooperation rate:	71.88 %
Household response rate:	67.17 %
Household response rate (only based on attempted HH):	67.17 %
Refusal rate:	13.54 %
Other non-interview rate:	12.74 %
Individual interviews:	1155
Individual response rate:	63.92 %
Median number of attempts for not successfully contacted hh:	4
Number of interviewers in Sample CTRL:	81
Number of interviewers who have synched*	75

France	**week 37**
Baseline / refreshment sample	
Gross sample:	2389
Eligible households:	1213
Ineligible households:	211
Households with unknown eligibility:	965

Households attempted:	2241
Households contacted:	1714
Estimated proportion of eligible households:	85.18 %
Households estimated to be eligible:	2035.01
Households with completed coverscreen interview:	393
Households with at least one complete interview:	328
Percentage of Households attempted:	93.80 %
Contact rate:	70.90 %
Cooperation rate:	22.73 %
Household response rate:	16.12 %
Household response rate (only based on attempted HH):	27.04 %
Refusal rate:	30.84 %
Other non-interview rate:	23.94 %
Individual interviews:	450
Estimated average number of eligibles in hh:	1.54
Individual response rate:	14.34 %
Median number of attempts for not successfully contacted hh:	0
Longitudinal sample	
Gross sample:	3402
Eligible households:	3368
Ineligible households:	34
Households with unknown eligibility:	0
Households attempted:	3354
Households contacted:	3066
Estimated proportion of eligible households:	99.00 %
Households estimated to be eligible:	3368.00
Households with completed coverscreen interview:	1845
Households with at least one complete interview:	1763
Percentage of Households attempted:	98.59 %
Contact rate:	90.02 %
Cooperation rate:	58.15 %
Household response rate:	52.35 %
Household response rate (only based on attempted HH):	52.35 %
Refusal rate:	17.52 %
Other non-interview rate:	20.16 %
Individual interviews:	2520
Individual response rate:	50.36 %
Median number of attempts for not successfully contacted hh:	3
Number of interviewers in Sample CTRL:	123
Number of interviewers who have synched*	114

Greece	week 37
Longitudinal sample	
Gross sample:	3095
Eligible households:	3082
Ineligible households:	13
Households with unknown eligibility:	0
Households attempted:	2983
Households contacted:	2911
Estimated proportion of eligible households:	99.58 %
Households estimated to be eligible:	3082.00
Households with completed coverscreen interview:	2123
Households with at least one complete interview:	2117
Percentage of Households attempted:	96.38 %
Contact rate:	94.03 %
Cooperation rate:	73.05 %
Household response rate:	68.69 %
Household response rate (only based on attempted HH):	68.69 %
Refusal rate:	21.45 %
Other non-interview rate:	3.89 %
Individual interviews:	3252
Individual response rate:	67.50 %
Median number of attempts for not successfully contacted hh:	4
Number of interviewers in Sample CTRL:	114
Number of interviewers who have synched*	107

Croatia	week 37
Baseline / refreshment sample	
Gross sample:	6075
Eligible households:	4614
Ineligible households:	1461
Households with unknown eligibility:	0
Households attempted:	4920
Households contacted:	4553
Estimated proportion of eligible households:	75.95 %
Households estimated to be eligible:	4614.00
Households with completed coverscreen interview:	1442
Households with at least one complete interview:	1371
Percentage of Households attempted:	80.99 %
Contact rate:	67.01 %
Cooperation rate:	44.34 %

Household response rate:	29.71 %
Household response rate (only based on attempted HH):	29.71 %
Refusal rate:	34.53 %
Other non-interview rate:	2.77 %
Individual interviews:	2080
Estimated average number of eligibles in hh:	1.17
Individual response rate:	38.38 %
Median number of attempts for not successfully contacted hh:	1
Longitudinal sample	
Gross sample:	2158
Eligible households:	2119
Ineligible households:	39
Households with unknown eligibility:	0
Households attempted:	2025
Households contacted:	1994
Estimated proportion of eligible households:	98.19 %
Households estimated to be eligible:	2119.00
Households with completed coverscreen interview:	1779
Households with at least one complete interview:	1765
Percentage of Households attempted:	93.84 %
Contact rate:	92.26 %
Cooperation rate:	90.28 %
Household response rate:	83.29 %
Household response rate (only based on attempted HH):	83.29 %
Refusal rate:	5.71 %
Other non-interview rate:	3.26 %
Individual interviews:	2762
Individual response rate:	82.80 %
Median number of attempts for not successfully contacted hh:	1
Number of interviewers in Sample CTRL:	113
Number of interviewers who have synched*	106

Hungary	week 37
Baseline / refreshment sample	
Gross sample:	880
Eligible households:	747
Ineligible households:	133
Households with unknown eligibility:	0
Households attempted:	869
Households contacted:	807
Estimated proportion of eligible households:	84.89 %

Households estimated to be eligible:	747.00
Households with completed coverscreen interview:	317
Households with at least one complete interview:	265
Percentage of Households attempted:	98.75 %
Contact rate:	90.23 %
Cooperation rate:	39.32 %
Household response rate:	35.48 %
Household response rate (only based on attempted HH):	35.48 %
Refusal rate:	47.79 %
Other non-interview rate:	6.96 %
Individual interviews:	397
Estimated average number of eligibles in hh:	1.20
Individual response rate:	44.41 %
Median number of attempts for not successfully contacted hh:	1
Longitudinal sample	
Gross sample:	1864
Eligible households:	1856
Ineligible households:	8
Households with unknown eligibility:	0
Households attempted:	1806
Households contacted:	1770
Estimated proportion of eligible households:	99.57 %
Households estimated to be eligible:	1856.00
Households with completed coverscreen interview:	1144
Households with at least one complete interview:	1104
Percentage of Households attempted:	96.89 %
Contact rate:	94.94 %
Cooperation rate:	62.66 %
Household response rate:	59.48 %
Household response rate (only based on attempted HH):	59.48 %
Refusal rate:	24.30 %
Other non-interview rate:	11.15 %
Individual interviews:	1612
Individual response rate:	58.13 %
Median number of attempts for not successfully contacted hh:	2
Number of interviewers in Sample CTRL:	62
Number of interviewers who have synched*	57

Israel	week 37
Baseline / refreshment sample	
Gross sample:	256
Eligible households:	24
Ineligible households:	0
Households with unknown eligibility:	232
Households attempted:	24
Households contacted:	24
Estimated proportion of eligible households:	100.00 %
Households estimated to be eligible:	256.00
Households with completed coverscreen interview:	21
Households with at least one complete interview:	21
Percentage of Households attempted:	9.38 %
Contact rate:	9.38 %
Cooperation rate:	87.50 %
Household response rate:	8.20 %
Household response rate (only based on attempted HH):	87.50 %
Refusal rate:	0.39 %
Other non-interview rate:	0.78 %
Individual interviews:	26
Estimated average number of eligibles in hh:	1.71
Individual response rate:	5.92 %
Median number of attempts for not successfully contacted hh:	.
Longitudinal sample	
Gross sample:	1977
Eligible households:	1975
Ineligible households:	0
Households with unknown eligibility:	0
Households attempted:	795
Households contacted:	770
Estimated proportion of eligible households:	100.00 %
Households estimated to be eligible:	1975.00
Households with completed coverscreen interview:	547
Households with at least one complete interview:	539
Percentage of Households attempted:	40.21 %
Contact rate:	38.89 %
Cooperation rate:	70.18 %
Household response rate:	27.29 %
Household response rate (only based on attempted HH):	27.29 %
Refusal rate:	7.24 %
Other non-interview rate:	4.35 %

Individual interviews:	760
Individual response rate:	24.85 %
Median number of attempts for not successfully contacted hh:	2
Number of interviewers in Sample CTRL:	17
Number of interviewers who have synched*	11

Italy	**week 37**
Longitudinal sample	
Gross sample:	3258
Eligible households:	3236
Ineligible households:	22
Households with unknown eligibility:	0
Households attempted:	3210
Households contacted:	3178
Estimated proportion of eligible households:	99.32 %
Households estimated to be eligible:	3236.00
Households with completed coverscreen interview:	2502
Households with at least one complete interview:	2420
Percentage of Households attempted:	98.53 %
Contact rate:	97.53 %
Cooperation rate:	76.68 %
Household response rate:	74.78 %
Household response rate (only based on attempted HH):	74.78 %
Refusal rate:	15.17 %
Other non-interview rate:	7.57 %
Individual interviews:	3883
Individual response rate:	75.07 %
Median number of attempts for not successfully contacted hh:	6
Number of interviewers in Sample CTRL:	142
Number of interviewers who have synched*	122

Lithuania	**week 37**
Longitudinal sample	
Gross sample:	1372
Eligible households:	1352
Ineligible households:	20
Households with unknown eligibility:	0
Households attempted:	1353
Households contacted:	1348
Estimated proportion of eligible households:	98.54 %

Households estimated to be eligible:	1352.00
Households with completed coverscreen interview:	1075
Households with at least one complete interview:	1058
Percentage of Households attempted:	98.62 %
Contact rate:	98.22 %
Cooperation rate:	79.67 %
Household response rate:	78.25 %
Household response rate (only based on attempted HH):	78.25 %
Refusal rate:	12.72 %
Other non-interview rate:	7.25 %
Individual interviews:	1477
Individual response rate:	76.59 %
Median number of attempts for not successfully contacted hh:	8
Number of interviewers in Sample CTRL:	42
Number of interviewers who have synched*	38

Luxembourg	week 37
Longitudinal sample	
Gross sample:	1026
Eligible households:	1004
Ineligible households:	22
Households with unknown eligibility:	0
Households attempted:	1026
Households contacted:	1019
Estimated proportion of eligible households:	97.86 %
Households estimated to be eligible:	1004.00
Households with completed coverscreen interview:	580
Households with at least one complete interview:	579
Percentage of Households attempted:	100.00 %
Contact rate:	99.30 %
Cooperation rate:	58.07 %
Household response rate:	57.67 %
Household response rate (only based on attempted HH):	57.67 %
Refusal rate:	25.00 %
Other non-interview rate:	16.63 %
Individual interviews:	824
Individual response rate:	50.31 %
Median number of attempts for not successfully contacted hh:	9
Number of interviewers in Sample CTRL:	19
Number of interviewers who have synched*	19

Latvia	week 37
Baseline / refreshment sample	
Gross sample:	1235
Eligible households:	335
Ineligible households:	179
Households with unknown eligibility:	721
Households attempted:	848
Households contacted:	654
Estimated proportion of eligible households:	65.18 %
Households estimated to be eligible:	804.91
Households with completed coverscreen interview:	276
Households with at least one complete interview:	272
Percentage of Households attempted:	68.66 %
Contact rate:	52.87 %
Cooperation rate:	63.92 %
Household response rate:	33.79 %
Household response rate (only based on attempted HH):	81.19 %
Refusal rate:	15.13 %
Other non-interview rate:	3.94 %
Individual interviews:	420
Estimated average number of eligibles in hh:	1.56
Individual response rate:	33.41 %
Median number of attempts for not successfully contacted hh:	0
Longitudinal sample	
Gross sample:	1214
Eligible households:	1206
Ineligible households:	8
Households with unknown eligibility:	0
Households attempted:	1176
Households contacted:	1151
Estimated proportion of eligible households:	99.34 %
Households estimated to be eligible:	1206.00
Households with completed coverscreen interview:	963
Households with at least one complete interview:	947
Percentage of Households attempted:	96.87 %
Contact rate:	94.78 %
Cooperation rate:	82.85 %
Household response rate:	78.52 %
Household response rate (only based on attempted HH):	78.52 %
Refusal rate:	11.11 %
Other non-interview rate:	5.14 %

Individual interviews:	1374
Individual response rate:	80.12 %
Median number of attempts for not successfully contacted hh:	3
Number of interviewers in Sample CTRL:	29
Number of interviewers who have synched*	25

Malta	week 37
Longitudinal sample	
Gross sample:	725
Eligible households:	722
Ineligible households:	2
Households with unknown eligibility:	0
Households attempted:	714
Households contacted:	676
Estimated proportion of eligible households:	99.72 %
Households estimated to be eligible:	722.00
Households with completed coverscreen interview:	549
Households with at least one complete interview:	548
Percentage of Households attempted:	98.48 %
Contact rate:	93.21 %
Cooperation rate:	81.43 %
Household response rate:	75.90 %
Household response rate (only based on attempted HH):	75.90 %
Refusal rate:	14.82 %
Other non-interview rate:	2.49 %
Individual interviews:	904
Individual response rate:	75.69 %
Median number of attempts for not successfully contacted hh:	3
Number of interviewers in Sample CTRL:	16
Number of interviewers who have synched*	11

Netherlands	week 37
Longitudinal sample	
Gross sample:	2795
Eligible households:	2780
Ineligible households:	13
Households with unknown eligibility:	0
Households attempted:	2595
Households contacted:	2547
Estimated proportion of eligible households:	99.53 %

Households estimated to be eligible:	2780.00
Households with completed coverscreen interview:	1452
Households with at least one complete interview:	1439
Percentage of Households attempted:	92.84 %
Contact rate:	91.08 %
Cooperation rate:	56.83 %
Household response rate:	51.76 %
Household response rate (only based on attempted HH):	51.76 %
Refusal rate:	23.02 %
Other non-interview rate:	16.29 %
Individual interviews:	2139
Individual response rate:	48.88 %
Median number of attempts for not successfully contacted hh:	8
Number of interviewers in Sample CTRL:	92
Number of interviewers who have synched*	80

Poland	week 37
Baseline / refreshment sample	
Gross sample:	2740
Eligible households:	2228
Ineligible households:	512
Households with unknown eligibility:	0
Households attempted:	2722
Households contacted:	2475
Estimated proportion of eligible households:	81.31 %
Households estimated to be eligible:	2228.00
Households with completed coverscreen interview:	730
Households with at least one complete interview:	676
Percentage of Households attempted:	99.34 %
Contact rate:	88.11 %
Cooperation rate:	34.44 %
Household response rate:	30.34 %
Household response rate (only based on attempted HH):	30.34 %
Refusal rate:	51.26 %
Other non-interview rate:	6.51 %
Individual interviews:	998
Estimated average number of eligibles in hh:	1.18
Individual response rate:	37.90 %
Median number of attempts for not successfully contacted hh:	3
Longitudinal sample	
Gross sample:	3356

Eligible households:	3342
Ineligible households:	12
Households with unknown eligibility:	0
Households attempted:	3319
Households contacted:	3258
Estimated proportion of eligible households:	99.64 %
Households estimated to be eligible:	3342.00
Households with completed coverscreen interview:	2746
Households with at least one complete interview:	2715
Percentage of Households attempted:	98.90 %
Contact rate:	97.07 %
Cooperation rate:	83.69 %
Household response rate:	81.24 %
Household response rate (only based on attempted HH):	81.24 %
Refusal rate:	10.62 %
Other non-interview rate:	5.21 %
Individual interviews:	4141
Individual response rate:	79.12 %
Median number of attempts for not successfully contacted hh:	6
Number of interviewers in Sample CTRL:	114
Number of interviewers who have synched*	96

Portugal	week 37
Baseline / refreshment sample	
Gross sample:	1057
Eligible households:	892
Ineligible households:	165
Households with unknown eligibility:	0
Households attempted:	1057
Households contacted:	1017
Estimated proportion of eligible households:	84.39 %
Households estimated to be eligible:	892.00
Households with completed coverscreen interview:	421
Households with at least one complete interview:	388
Percentage of Households attempted:	100.00 %
Contact rate:	95.52 %
Cooperation rate:	45.54 %
Household response rate:	43.50 %
Household response rate (only based on attempted HH):	43.50 %
Refusal rate:	43.39 %
Other non-interview rate:	8.63 %
Individual interviews:	577

Estimated average number of eligibles in hh:	1.30
Individual response rate:	49.57 %
Median number of attempts for not successfully contacted hh:	7
Longitudinal sample	
Gross sample:	1104
Eligible households:	1100
Ineligible households:	3
Households with unknown eligibility:	0
Households attempted:	1098
Households contacted:	1078
Estimated proportion of eligible households:	99.73 %
Households estimated to be eligible:	1100.00
Households with completed coverscreen interview:	737
Households with at least one complete interview:	720
Percentage of Households attempted:	99.46 %
Contact rate:	97.64 %
Cooperation rate:	67.04 %
Household response rate:	65.45 %
Household response rate (only based on attempted HH):	65.45 %
Refusal rate:	17.64 %
Other non-interview rate:	14.55 %
Individual interviews:	1120
Individual response rate:	64.40 %
Median number of attempts for not successfully contacted hh:	6
Number of interviewers in Sample CTRL:	72
Number of interviewers who have synched*	68

Romania	week 37
Longitudinal sample	
Gross sample:	1172
Eligible households:	1165
Ineligible households:	6
Households with unknown eligibility:	0
Households attempted:	1139
Households contacted:	1118
Estimated proportion of eligible households:	99.49 %
Households estimated to be eligible:	1165.00
Households with completed coverscreen interview:	1072
Households with at least one complete interview:	1034
Percentage of Households attempted:	97.18 %
Contact rate:	95.36 %

Cooperation rate:	93.07 %
Household response rate:	88.76 %
Household response rate (only based on attempted HH):	88.76 %
Refusal rate:	5.24 %
Other non-interview rate:	1.37 %
Individual interviews:	1623
Individual response rate:	91.15 %
Median number of attempts for not successfully contacted hh:	1
Number of interviewers in Sample CTRL:	39
Number of interviewers who have synched*	35

Sweden	week 37
Baseline / refreshment sample	
Gross sample:	324
Eligible households:	300
Ineligible households:	24
Households with unknown eligibility:	0
Households attempted:	318
Households contacted:	269
Estimated proportion of eligible households:	92.59 %
Households estimated to be eligible:	300.00
Households with completed coverscreen interview:	43
Households with at least one complete interview:	42
Percentage of Households attempted:	98.15 %
Contact rate:	81.67 %
Cooperation rate:	17.14 %
Household response rate:	14.00 %
Household response rate (only based on attempted HH):	14.00 %
Refusal rate:	40.33 %
Other non-interview rate:	27.33 %
Individual interviews:	47
Estimated average number of eligibles in hh:	1.06
Individual response rate:	14.73 %
Median number of attempts for not successfully contacted hh:	4
Longitudinal sample	
Gross sample:	2889
Eligible households:	2877
Ineligible households:	12
Households with unknown eligibility:	0
Households attempted:	2880
Households contacted:	2781

Estimated proportion of eligible households:	99.58 %
Households estimated to be eligible:	2877.00
Households with completed coverscreen interview:	1931
Households with at least one complete interview:	1926
Percentage of Households attempted:	99.69 %
Contact rate:	96.25 %
Cooperation rate:	69.56 %
Household response rate:	66.94 %
Household response rate (only based on attempted HH):	66.94 %
Refusal rate:	23.29 %
Other non-interview rate:	6.01 %
Individual interviews:	2597
Individual response rate:	57.96 %
Median number of attempts for not successfully contacted hh:	8
Number of interviewers in Sample CTRL:	76
Number of interviewers who have synched*	69

Slovenia	week 37
Baseline / refreshment sample	
Gross sample:	2236
Eligible households:	1863
Ineligible households:	373
Households with unknown eligibility:	0
Households attempted:	2225
Households contacted:	2164
Estimated proportion of eligible households:	83.32 %
Households estimated to be eligible:	1863.00
Households with completed coverscreen interview:	653
Households with at least one complete interview:	636
Percentage of Households attempted:	99.51 %
Contact rate:	96.14 %
Cooperation rate:	35.51 %
Household response rate:	34.14 %
Household response rate (only based on attempted HH):	34.14 %
Refusal rate:	58.78 %
Other non-interview rate:	3.22 %
Individual interviews:	878
Estimated average number of eligibles in hh:	1.24
Individual response rate:	38.03 %
Median number of attempts for not successfully contacted hh:	6
Longitudinal sample	

Gross sample:	3187
Eligible households:	3141
Ineligible households:	45
Households with unknown eligibility:	0
Households attempted:	3176
Households contacted:	3171
Estimated proportion of eligible households:	98.59 %
Households estimated to be eligible:	3141.00
Households with completed coverscreen interview:	2526
Households with at least one complete interview:	2514
Percentage of Households attempted:	99.65 %
Contact rate:	99.49 %
Cooperation rate:	80.45 %
Household response rate:	80.04 %
Household response rate (only based on attempted HH):	80.04 %
Refusal rate:	16.71 %
Other non-interview rate:	2.74 %
Individual interviews:	3744
Individual response rate:	76.17 %
Median number of attempts for not successfully contacted hh:	9
Number of interviewers in Sample CTRL:	66
Number of interviewers who have synched*	62

Slovakia	week 37
Longitudinal sample	
Gross sample:	750
Eligible households:	742
Ineligible households:	8
Households with unknown eligibility:	0
Households attempted:	746
Households contacted:	746
Estimated proportion of eligible households:	98.93 %
Households estimated to be eligible:	742.00
Households with completed coverscreen interview:	671
Households with at least one complete interview:	656
Percentage of Households attempted:	99.47 %
Contact rate:	99.46 %
Cooperation rate:	88.89 %
Household response rate:	88.41 %
Household response rate (only based on attempted HH):	88.41 %
Refusal rate:	8.63 %
Other non-interview rate:	2.43 %

Individual interviews:	1062
Individual response rate:	88.87 %
Median number of attempts for not successfully contacted hh:	.
Number of interviewers in Sample CTRL:	38
Number of interviewers who have synched*	37

* Number of interviewers synched may slightly differentiate from the number of interviewrers in Sample CTRL and identifies interviewers without conducted interviews.

CHAPTER 7

Data Quality Back-checks in SHARE Wave 9 (CATI & CAPI)

07
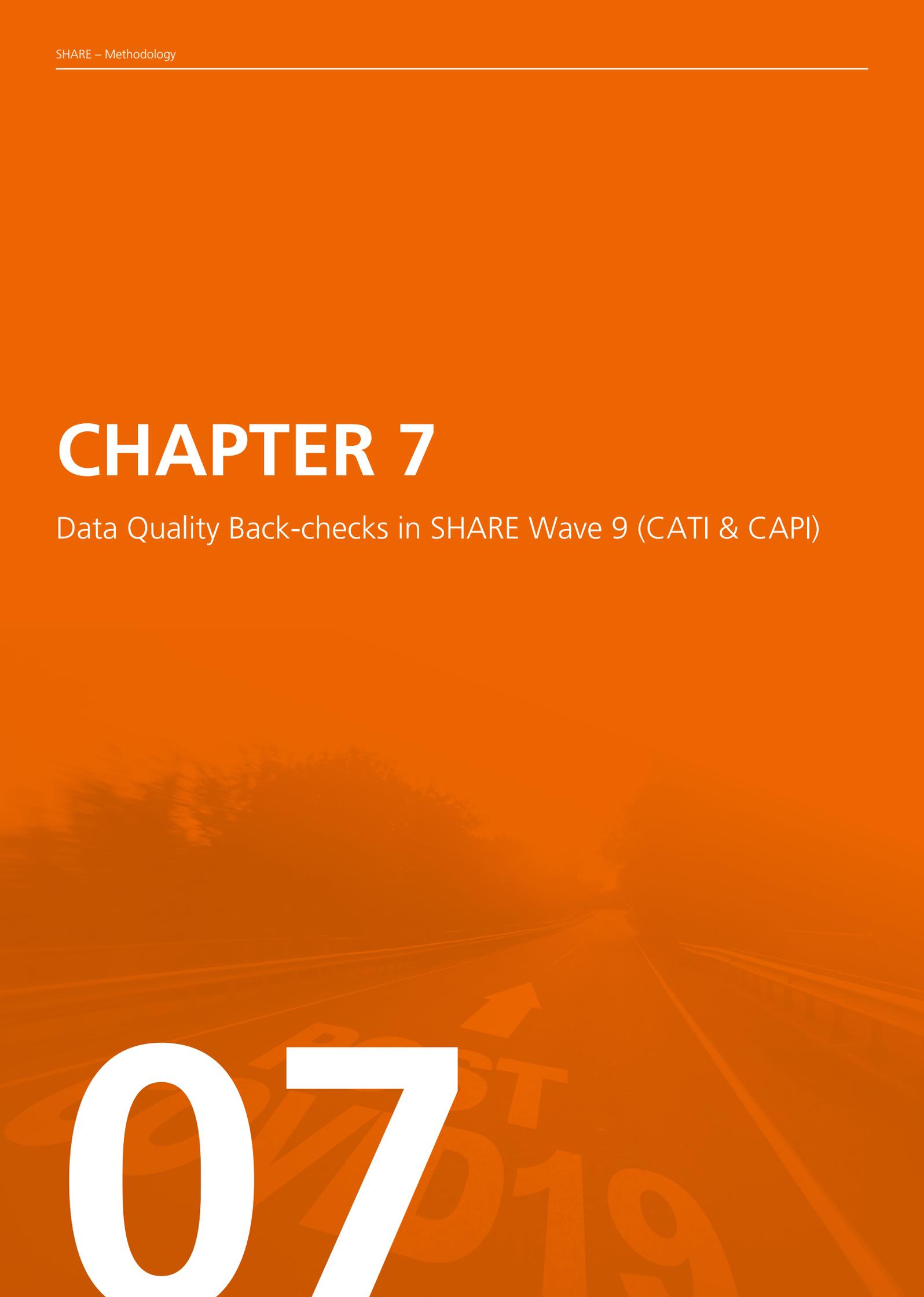
7 DATA QUALITY BACK-CHECKS IN SHARE WAVE 9 (CATI & CAPI)

Tessa-Virginia Hannemann and Michael Bergmann

SHARE takes several steps to ensure data quality. One important step is to verify the authenticity of the interviews themselves. This is done in SHARE with continuous back-checking of a subset of completed interviews during fieldwork. In the following, we will explain the procedures set in place to systematically check interviews, in a subset of randomly selected completed interviews, i.e. random back-checks and in interviews that had been identified as suspicious, i.e. focused back-checks. Further, we will report on the detection of suspicious interviews throughout Wave 9 fieldwork, including the second SHARE Corona Survey (SCS2) in summer 2021 and the regular Wave 9 face-to-face fieldwork beginning end of 2021 until summer 2022.

The procedure was first implemented in Wave 8 (see Hannemann & Bergmann, 2021) and adjusted in Wave 9 to meet the requirements of the survey agencies and SHARE Central. This included decreasing the percentage of selected households to 10 percent of all completed interviews, whereas the frequency of selection was kept in a biweekly rhythm in accordance with data synchronisation. This allowed for necessary interventions during fieldwork. Focused back-checks were conducted to detect possible falsification, using the procedure described in Bergmann and Schuller (2019). The following will describe in further detail the selection process and interventions needed during the fieldwork of Wave 9.

7.1 Data Quality Back-checks in SHARE Corona Survey 2

Although the technicalities of fieldwork had changed substantially compared to previous waves, due to the COVID-19 pandemic, interview verification was nonetheless an important part of quality control in SHARE. In the first SHARE Corona Survey (SCS1), interview verification had adjusted to the new circumstances (see Hannemann & Bergmann, 2021). This sub-chapter will describe any further adaptations needed for the second instalment, as well as a case study on falsified interviews and the actions taken in response to their discovery.

7.1.1 Accommodations Made for SHARE Corona Survey 2

Random Back-checks
Random back-checking resumed in calendar week 23 in 2021 and the final back-checks were sent out in week 36 in 2021. As data from the Computer-Assisted Telephone Interviews (CATI) were synchronised continuously, interviews considered for the selection of the back-checks were those that had been completed between the previous back-check and the current one. In order to compensate for the increased workload experienced in the SCS1, the amount of interviews randomly selected for verification was reduced to 10 percent in the SCS2. The verification questions were kept equal to the verification questions employed during SCS1. This was a reduced set of questions that were used in the main fieldwork (see Table 7.1 in the appendix, which shows the verification questions asked during the telephone back-checks in the SCS2). Questions that did not pertain to the telephone interviews were disregarded. These included the use of the hand-grip measure or the use of show cards by the interviewer.

Focused Back-checks
Two rounds of focused back-checks were sent out during the SCS2 fieldwork. There were five indicators that were used to identify suspicious interviews. These included the number of interviews conducted on a single day, (implausible) interview times, interview duration and speed, as well as response patterns, precisely item non-response and (near) duplicates. The indicators used to flag suspicious interviews are presented in Tables 7.2 as well as 7.6 and 7.7 (see appendix).

7.1.2 Results

A total of 4893 interviews were randomly selected to be verified during the SCS2 fieldwork. SHARE Central received 4031 completed back-checks. Table 7.3 in the appendix describes further the distribution of sent and received random back-checks across countries. During the focused back-

checks 221 interviews were identified as suspicious, i.e., at least 3 indicators have been flagged (see Table 7.4). Below, the process implemented for interviews that have been deemed falsifications is described in a case study.

7.1.3 Case Study: Falsifications in Belgium

In week 33, the Belgian (French) survey agency informed SHARE Central about suspicions of falsifications in the work of one interviewer, due to a completed SCS2 interview of a deceased respondent, which was discovered during the back-checks deeming the interview impossible. The survey agency then proceeded to check all the households that had been interviewed by this interviewer and raised suspicions about further interviews conducted by this interviewer. As soon as informed, SHARE Central carefully checked the 28 households (41 respondents) that had been interviewed by this interviewer, based on the indicators used for the focused back-checks. In contrast to many other interviewers, this interviewer did not conduct a large number of interviews on a single day (maximum: 6); the interview duration was plausible (minimum duration: 15 minutes, average: 28 minutes, which is even slightly longer than the country mean/median); item non-response was low, similar to other interviewers; there were no near duplicates (maximum match rate: 78 percent); only one single interview received one flag (this interview was started after 11pm).

Subsequently a more detailed analysis of the interviews was undertaken. The difficulty posed here, was that the SHARE Corona Survey questionnaire did not yield many questions that could be used for verification (i.e., compared to previous waves). In a first step, information on gender, age and sex was compared to the interview data to detect any mismatches in the households. This check did not reveal any anomalies, although this information could be easily retrieved by the interviewer. In a second step, respondents' working status as well as self-rated health was checked for apparent inconsistencies over time. As both items are subject to potential changes over time, concluding a falsification on these items, however, was difficult. Regarding working status, we did not detect any anomalies. Retired respondents did not re-enter the job market and other changes in the respondents' working status did not raise suspicion. While self-rated health remained stable between Waves 6, 7 and 8 (in Wave 8, however, only one respondent could be reached before the suspension of fieldwork), as well as the SCS1, there was an unexpected large improvement of self-rated health in the SCS2 of more than 2.5 points on a 5-point scale. This is in sharp contrast to the rest of the Belgian (French) SHARE sample, which shows an overall small decrease in self-rated health between SCS1 and SCS2.

Following this, the survey agency questioned the suspected interviewer and concluded that survey protocols were not followed correctly. Collectively, the information provided by the survey agency, the analyses carried out by SHARE Central, and the responses from the interviewer in question, lead to the decision not to consider the 41 interviews by said interviewer.

7.1.4 Discussion and Lessons Learned

The continuation of interview verification proved to be easily implemented, considering the exceptional circumstances of the SCS2. Only few adaptations from the SCS1 were needed, most notably the reduction of selected households to 10 percent.

The case study described in this chapter shows not only the importance of interview verification processes, but more importantly the close communication with the national survey agencies in the field. At SHARE Central, we can search for inconsistencies within the data in order to infer falsifications, but the teams in the field, that are in direct contact with the interviewers and respondents, have access to valuable additional information, to further inform any type of investigation. In the present case, a conclusion was made based on information provided by the survey agency, the interviewer and SHARE Central. It also illustrates the importance of timing of verifications. The sooner cases of falsifications are flagged and investigated the fewer affected interviews will be deemed unusable.

7.2 Data Quality Back-checks in SHARE Main Wave 9

7.2.1 Selection, Distribution, and Verification of Interviews

Random Back-checks
As with fieldwork of the SCS2, only interviews that were completed in the time since last data delivery (i.e., 2 weeks) were included in the back-check selection. We aimed again at a verifying 10 percent of interviews that were conducted by each interviewer throughout fieldwork as the workload for the survey agencies was very high during the SCS1 and we did not want to overburden respondents.

Similar to Wave 8, a template was sent out including the interviews to be back-checked along with verification questions. An overview of the template used for the random back-checks during the Computer-Assisted Personal Interview (CAPI) can be seen in Table 7.1 in the appendix. These templates were shared via a secure server to ensure data protection according to GDPR. Once checking had been completed, the survey agencies were instructed to send

back the completed back-checking template, again via the secure server.

To increase the compliance of completing the back-checks, SHARE Central sent out regular updates on the number of households that had been selected for random (and focused) back-checks and the number of completed back-checks we had thus far received. This update was shared with the survey agencies as well as the country teams and helped encourage back-checking in several instances.

End-of-Life interviews were excluded from the back-checking procedure to prevent sample attrition through unnecessary strain on a bereaved proxy. In addition, the verification questions would not align with the content of the End-of-Life interviews and would lead to incorrect conclusions from the checks.

In almost all countries the main mode of contact for the back-checks was telephone. Only the Netherlands and Germany opted to verifying the interviews via post. As in the previous wave, 100 percent of households with completed interviews were recontacted via mail and asked to complete the verification questionnaire and send it back per mail. A total of 2,788 verification questionnaires were returned, 8 were returned due to faulty addresses.

Focused Back-checks

Focused back-checks are checks to verify interviews that have been flagged as suspicious, i.e., it is not certain that these interviews have been conducted at all. Focused back-checks were conducted every 4-6 weeks during the face-to-face fieldwork of Wave 9. As opposed to Wave 8, in which 14 indicators were employed, 7 indicators were monitored to determine whether or not an interview was deemed suspicious. The indicators are presented in Table 7.2 in the appendix. To calculate the indicators information from the Case CTRL software (see Chapter 5 on software innovations), the CAPI data as well as paradata was taken into consideration. The mere presence of an indicator did not deem an interview as suspicious but rather a threshold of indicators (4/7) created the need to verify the interview. However, contradicting information from preload and CAPI was sufficient to flag an interview as suspicious.

For both back-checking procedures, we asked the survey agencies to evaluate the verification, stating whether the interview appeared to be "OK" or not. If any doubts about the interview arose due to the back-checks, the survey agencies were instructed to first contact the corresponding interviewer and discuss the issue with them. If this resulted in further suspicion, the issue was brought up to SHARE Central, and any subsequent steps were discussed (see above for a case study, in which suspicious interviews were identified by the survey agency and the subsequent actions that were taken).

7.2.2 Results

During Wave 9 main data collection, 6,920 households were selected for random back-checking. The first back-checks were sent out after the data synchronisation of calendar week 45 in 2021 and the final back-checks were sent out after data synchronisation in calendar week 37 in 2022. Individual fieldwork times determined in which weeks countries would receive back-checks from SHARE Central. A total of 6,076 completed back-checks were returned to SHARE Central. Table 7.3 (see appendix) gives an overview of the random back-checks sent out to each country as well as the number of checked interviews received.

Focused back-checks were sent out after data synchronisation in calendar weeks 49 in 2021, and calendar weeks 3, 13, 19 and 31 in 2022. In total, 288 interviews were identified as suspicious during Wave 9 fieldwork (see Table 7.4).

7.2.3 Contact Rates in Back-checking

A few countries reported their difficulties reaching the 10 percent back-checked, due to not being able to reach the selected households. For this chapter the contact rate as well as reasons for no contact regarding the random back-checks were investigated further and are presented in Table 7.5 in the appendix. The country with the most successful contact attempts was Slovakia, who reached nearly all households (93 percent), considering only the completed back-checks provided to SHARE Central. Romania seemed to have the most difficulties in reaching households for back-checking purposes, as only 31 percent of selected households could be back-checked. The reason most frequently stated for no contact was either no answer, even with multiple attempts, or no or incorrect telephone number. In Austria, additional households were selected for back-checking, as there was the concern that not all interviewers would have at least some of their work verified, due to difficulties reaching respondents.

7.2.4 Discussion and Lessons Learned

Overall, there was good acceptance of the procedures. The updates sent out periodically to inform the survey agencies and country teams of the progress of the back-checks proved to be helpful in increasing compliance of the completed back-checks. However, it must also be mentioned that the timing of the previous wave coincided with the beginning of the global COVID-19 pandemic, which had a profound impact on all of fieldwork, including verification of interviews. The added updates also allowed for a swift reaction during fieldwork, should there be problems with the verification process – i.e., low contact rates, problems

with accessing the files, or missed communications. Following this, the task of back-checking itself also yielded some results in identifying problems during fieldwork, i.e., suspicious interviews. This shows clearly that conducting the quality checks during the time of fieldwork, as opposed to afterwards, increases the possibilities to react and correct any issues that arise promptly.

In this chapter we also looked in particular at the contact rate for the verification interviews. There was great variation across countries as well as during the fieldwork, but the outreach to the households remained a concern alongside the contact rate of the main fieldwork. One solution to ensure that interviewers work is verified despite the difficulties of reaching respondents is the additional selection of household. This was suggested by a few countries and could be implemented in the future by simply increasing the percentage of completed interviews selected (i.e., selecting 12-15 percent of interviews instead of 10 percent). Given the easily adjustable procedure of the back-checks this is an issue that

can be addressed quickly during fieldwork if the need arises. Additionally, one of the most frequently stated reasons for no contact during the back-checking procedure was the lack of contact information. Prior to fieldwork, contact information of the respondents need to be verified and updated, if needed. Apart from data quality back-checks, this will become even more important with regard to a future implementation of multimode designs including telephone and web interviews in SHARE.

Finally, it is of great importance that the verification of the interviews takes place as soon as possible. Given that the SHARE target population consists of respondents aged 50 years and older, relying on specific verification questions can be difficult. Timely back-checking can ensure more precise information also from cognitively impaired respondents and therefore more reliable results. In addition, it also facilitates swift correction of falsifications or other discrepancies before fieldwork has ended.

References

Hannemann, T.-V. and Bergmann, M. (2021). Data quality back-checks in the regular SHARE Wave 8. In: M. Bergmann & A. Börsch-Supan (Eds.). SHARE Wave 8 Methodology: Collecting cross-national survey data in times of COVID-19. MEA, Max Planck Institute for Social Law and Social Policy.

Bergmann, M. and Schuller, K. (2019). Improving the efficiency of data quality back checks: A new procedure to prevent curbstoning. In: M. Bergmann, A.Scherpenzeel, & A. Börsch-Supan (Eds.). SHARE Wave 7 Methodology: Panel innovations and life histories. MEA, Max Planck Institute for Social Law and Social Policy.

APPENDIX

Table 7.1: Verification Questions Asked during Fieldwork

		SCS2 (CATI)	SHARE Main Wave 9 (CAPI)
Household ID (hhidcom)		+	+
Person ID (pidcom)		+	+
Laptop ID (laptop_s9)		+	+
Interviewer ID (interviewerid_s9)		+	+
Mode and sequence of contact attempts	1 - in person 2 - telephone 3 - mail (Please document each contact attempt before actual contact by new code in a row)	+	+
Successful contact in the end?	1 - yes 2 - no	+	+
If no: Reason for non-contact	1 - no/wrong phone number 2 - wrong address 3 - no answer 4 - refusal 5 - deceased 6 - other	+	+
If reached person is not selected person	enter pidcom of reached person (if different from Person ID)	+	+
1) Has one of our interviewers recently interviewed you or someone from your household for the SHARE study?	1 - yes 2 - DK (quit interview!) 3 - no (quit interview!)	+	+
2) If yes: With whom was the interview conducted?	1 - with me 2 - with my partner 3 - with me and my partner 4 - with another person	+	+
3) How was the interview conducted?	1 - in person (with laptop) 2 - in person (paper & pencil) 3 - by telephone 4 - other	+	+
4) Where was the interview conducted?	1 - at respondent's home 2 - in hospital 3 - at nursing home 4 - at another place		+
5a) How long was the interview with you?	≈ minutes	+	+
5b) If partner interview: How long was the interview with your partner?	≈ minutes	+	+

		SCS2 (CATI)	SHARE Main Wave 9 (CAPI)
6) Did the interviewer use a device to measure the strength of your hands?	1 - yes 2 - no, measure was not possible 3 - no, I refused to do the measure 4 - no, I was not asked 5 - DK		+
7) Did the interviewer use showcards during the interview?	1 - yes 2 - no 3 - DK		+
8) Did you receive a monetary incentive for your participation in the SHARE study?	1 - yes 2 - no 3 - DK	+	+
9) What is your year of birth?	year of birth	+	+
10) Only if not sure: What is your gender?	1 - male 2 - female	+	+
Other comments by respondent		+	+
Evaluation of back check by survey agency	1 - interview ok 2 - not sure/DK 3 - interview not ok	+	+
If interview not ok: Consultation with interviewer regarding suspicion	1 - yes 2 - no	+	+
Final decision by survey agency after consultation with interviewer	1 - interview ok 2 - interview not ok	+	+

Table 7.2: Indicators Used to Flag Suspicious Interviews

CAPI Data		CATI Data		Description
Number of interviews on same day	+	Number of interviews on same day	+	Interview is flagged as suspicious if four (CAPI)/seven (CATI) or more interviews in different households have been conducted by an interviewer on the same day
Implausible interview times	+	Implausible interview times	+	Interview is flagged as suspicious if the starting time of an interview is between 11 pm and 6 am & if the time interval between consecutive interviews in different households by a single interviewer is lower than 15 minutes (only for CAPI)
Interview duration & speed	-	Interview duration & speed	-	Interview is flagged as suspicious if the residual of a linear regression, using the log normal distribution of interview length (based on keystroke data without the IV module) regressed on key respondent and interview characteristics (i.e. year of birth, self-rated health, number of asked items, sequence number of interview, questionnaire version, and interview language) is below the 5th percentile in the respective country

CAPI Data		CATI Data		Description
Item nonresponse (overall, income)	+	Item nonresponse (overall, income)	+	Interview is flagged as suspicious if a) the proportion of item nonresponse on the household income item of all interviews conducted by the same interviewer is higher than 50% or lower than 1% b) the proportion of item nonresponse on all substantial items of all interviews conducted by the same interviewer is higher than 50% or lower than 1%
Near duplicate	+	Near duplicate	+	Interview is flagged as suspicious if the match rate (i.e. the percentage of items on which a respondent's data matches the data of any other respondent in the sample) within an interviewer is above 85%
Deviation from last wave	+			Interview is flagged as suspicious if a change in the respondent's dominant hand and/or an absolute weight change of more than 20 kg have been recorded)
Rounding in grip strength measurement	+			Rounding in grip strength measurement: interview is flagged as suspicious if multiples of 5 have been recorded in all four grip strength measures (two measurements with each hand)

Note: A minus (plus) sign besides the variable indicates that we assume less (more) of this respective indicator for fabricated interviews; e.g., we expect more deviations from last wave.

Table 7.3: Overview of Random Back-checks during Fieldwork

Country	SHARE Corona Survey 2 (CATI)		SHARE Main Wave 9 (CAPI)	
	hhs selected	hhs checked	hhs selected	hhs checked
AT	236	236	363	380
BE_fr	158	158	225	269
BE_nl	210	210	262	262
BG	76	76	92	92
CH	195	195	211	211
CY	67	67	84	84
CZ	214	192	373	200
DK	157	124	251	251
EE	413	413	508	503
ES	192	192	237	229
FI	145	145	195	195
FR	191	191	341	341
GR	364	4	353	0
HR	199	199	524	508
HU	86	86	199	199

Country	SHARE Corona Survey 2 (CATI)		SHARE Main Wave 9 (CAPI)	
	hhs selected	hhs checked	hhs selected	hhs checked
IL	135	135	77	78
IT	373	83	418	313
LT	135	135	133	133
LU	93	93	91	91
LV	103	0	190	190
MT	80	80	94	94
PL	292	292	545	545
PT	114	114	188	188
RO	154	154	162	70
SE	103	103	275	275
SI	306	302	457	457
SK	52	52	92	92
Total	4843	4031	6940	6250

Table 7.4: Overview of Focused Back-checks during Fieldwork

Country	SHARE Corona Survey 2 (CATI)		SHARE Main Wave 9 (CAPI)	
	hhs selected	hhs checked	hhs selected	hhs checked
AT	5	0	2	2
BE_fr	0	0	2	1
BE_nl	0	0	4	0
BG	5	5	0	0
CH	2	2	5	2
CY	0	0	2	1
CZ	0	0	4	2
DK	0	0	2	1
EE	28	27	5	2
ES	0	0	41	25
FI	0	0	0	0
FR	0	0	2	0
GR	82	0	6	0
HR	0	0	27	12
HU	19	0	33	0
IL	3	3	0	0
IT	12	0	30	10
LT	1	1	6	4
LU	1	1	0	0
LV	1	0	2	1
MT	2	1	3	2
PL	0	0	11	3

Country	SHARE Corona Survey 2 (CATI)		SHARE Main Wave 9 (CAPI)	
	hhs selected	hhs checked	hhs selected	hhs checked
PT	1	1	14	7
RO	17	15	38	5
SE	0	0	0	0
SI	10	10	12	6
SK	30	30	29	19
Total	221	96	288	105

Table 7.5: Contact Rates for Random Back-checks

Country	Mean Contact Rate Random Back-checks
AT	0.57
BE_fr	0.70
BE_nl	0.67
BG	0.74
CH	0.65
CY	0.69
CZ	0.34
DK	0.65
EE	0.81
ES	0.56
FI	0.72
FR	0.55
GR	-
HR	0.92
HU	0.55
IL	-
IT	0.83
LT	0.87
LU	0.66
LV	0.81
MT	0.91
PL	0.55
PT	0.67
RO	0.31
SE	0.69
SI	0.64
SK	0.93

Table 7.6: Interview Length in SHARE Corona Survey 2 by Countries

Country	Mean	Median	SD	# Items (mean)	N
AT	16.34	15.44	5.97	84.29	2314
BE (fr)	25.44	24.15	7.31	86.14	1425
BE (nl)	22.34	21.19	7.64	85.90	2026
BG	16.12	15.60	5.07	82.80	705
CH	22.36	21.54	6.98	81.34	1751
CY	14.09	12.36	7.20	84.15	653
CZ	18.92	18.19	6.10	80.89	2112
DE	23.60	22.84	6.49	82.31	2039
DK	23.88	22.99	6.72	82.32	1593
EE	16.10	15.49	6.53	80.68	4069
ES	16.69	15.50	6.83	90.09	1800
FI	25.53	25.08	6.06	79.37	1311
FR	21.29	20.84	6.44	83.30	1853
GR	17.99	16.49	8.20	78.37	3399
HR	14.81	14.15	6.26	80.88	1911
HU	15.57	15.37	5.85	80.79	862
IL	16.95	15.96	5.22	82.69	1291
IT	14.80	13.77	6.21	80.34	3358
LT	19.32	18.42	6.25	84.54	1259
LU	19.96	19.69	7.24	81.94	867
LV	18.29	17.69	6.29	83.27	975
MT	16.29	15.40	6.71	79.30	790
NL	22.40	21.55	5.55	82.29	730
PL	16.59	15.94	5.69	81.50	2794
RO	13.36	12.68	4.90	77.63	1467
SE	26.99	25.33	7.61	82.04	970
SI	17.00	16.30	5.26	81.45	2946
SK	16.46	15.75	6.53	79.04	926
Total	18.55	17.71	7.37	81.94	48196

Note: The sample is restricted to completed interviews; cases with missing keystroke information are not considered.
SD=standard deviation, N=Number of observations.

Table 7.7: Interview Length in SHARE Main Wave 9 by Country, Interview Version and Sample

Country	Interview version	Sample	Mean	Median	SD	# Items (mean)	N
AT	Single	Baseline/refreshment	59.07	57.32	17.46	359.22	268
		Panel	49.54	48.45	13.30	331.60	971
	Couple, first respondent	Baseline/refreshment	59.70	58.25	17.17	372.89	414
		Panel	48.61	47.67	12.23	335.21	827
	Couple, second respondent	Baseline/refreshment	34.66	32.07	12.17	272.29	234
		Panel	33.40	31.68	10.44	261.29	657
BE (fr)	Single	Baseline/refreshment	69.10	68.82	15.08	361.33	190
		Panel	65.30	64.67	15.72	336.39	673
	Couple, first respondent	Baseline/refreshment	72.38	71.05	16.01	377.15	173
		Panel	64.12	62.92	14.23	347.39	615
	Couple, second respondent	Baseline/refreshment	51.99	52.63	12.76	278.64	91
		Panel	46.99	45.64	10.41	274.14	324
BE (nl)	Single	Baseline/refreshment	68.47	64.73	17.36	370.56	87
		Panel	58.00	55.94	16.08	333.60	654
	Couple, first respondent	Baseline/refreshment	69.73	67.63	15.72	381.30	145
		Panel	57.84	55.95	14.61	344.75	887
	Couple, second respondent	Baseline/refreshment	54.09	53.00	15.29	294.19	84
		Panel	41.83	41.29	12.32	275.81	534
BG	Single	Baseline/refreshment	53.43	46.82	21.73	332.57	63
		Panel	45.69	43.61	19.23	304.77	262
	Couple, first respondent	Baseline/refreshment	51.62	50.37	16.26	338.02	53
		Panel	46.39	44.88	18.13	312.30	199
	Couple, second respondent	Baseline/refreshment	37.60	35.28	10.99	261.21	53
		Panel	31.96	32.17	12.66	246.55	187
CH	Single	Baseline/refreshment	59.15	57.27	16.10	350.67	36
		Panel	59.87	59.67	15.94	331.96	583
	Couple, first respondent	Baseline/refreshment	71.47	71.32	16.20	376.94	51
		Panel	60.85	60.93	14.25	337.38	690
	Couple, second respondent	Baseline/refreshment	50.38	53.13	15.09	273.00	28
		Panel	47.43	46.80	11.75	275.02	451
CY	Single	Baseline/refreshment	45.83	43.13	17.39	337.29	58
		Panel	48.96	45.85	16.65	307.80	99
	Couple, first respondent	Baseline/refreshment	48.42	43.50	19.02	336.22	173
		Panel	50.38	47.90	18.59	308.86	126
	Couple, second respondent	Baseline/refreshment	31.98	29.17	12.85	251.92	157
		Panel	33.33	31.88	11.60	245.22	117

Country	Interview version	Sample	Mean	Median	SD	# Items (mean)	N
CZ	Single	Baseline/refreshment	63.75	60.72	16.87	360.51	294
		Panel	55.68	54.05	14.07	327.50	986
	Couple, first respondent	Baseline/refreshment	64.09	60.40	19.63	368.09	253
		Panel	55.68	54.29	14.38	333.64	830
	Couple, second respondent	Baseline/refreshment	43.94	42.67	11.56	269.42	194
		Panel	38.92	37.63	10.55	260.45	722
DE	Single	Baseline/refreshment	70.42	69.60	17.14	360.77	311
		Panel	59.63	58.18	13.98	334.77	914
	Couple, first respondent	Baseline/refreshment	72.59	70.68	16.14	374.20	683
		Panel	59.29	57.70	12.99	337.17	1265
	Couple, second respondent	Baseline/refreshment	50.56	50.05	11.89	286.23	313
		Panel	43.97	42.93	10.44	275.41	963
DK	Single	Baseline/refreshment	87.60	87.73	15.45	389.85	27
		Panel	70.56	69.78	15.60	349.65	664
	Couple, first respondent	Baseline/refreshment	81.95	81.12	15.44	388.63	52
		Panel	70.46	69.82	15.20	360.08	972
	Couple, second respondent	Baseline/refreshment	57.21	58.92	10.55	299.73	41
		Panel	52.25	51.63	11.86	288.56	573
EE	Single	Baseline/refreshment	63.80	60.97	20.42	358.39	156
		Panel	53.21	50.20	19.12	322.92	1763
	Couple, first respondent	Baseline/refreshment	67.30	67.95	20.45	369.77	130
		Panel	55.21	53.55	19.18	337.13	1253
	Couple, second respondent	Baseline/refreshment	42.40	41.42	16.31	272.98	112
		Panel	37.97	36.38	14.35	262.30	995
ES	Single	Baseline/refreshment	37.94	36.47	20.47	324.18	181
		Panel	42.70	41.17	17.45	320.63	475
	Couple, first respondent	Baseline/refreshment	47.56	48.12	16.17	345.28	202
		Panel	42.44	42.12	15.94	322.60	547
	Couple, second respondent	Baseline/refreshment	33.20	31.42	12.73	262.03	115
		Panel	29.84	29.63	11.42	254.27	455
FI	Single	Baseline/refreshment	86.33	84.47	16.98	365.70	331
		Panel	72.73	70.90	18.27	335.48	225
	Couple, first respondent	Baseline/refreshment	85.08	85.15	15.44	379.10	377
		Panel	71.08	71.37	15.07	340.26	329
	Couple, second respondent	Baseline/refreshment	61.67	60.13	13.29	286.82	230
		Panel	54.71	54.33	12.63	273.67	255

Country	Interview version	Sample	Mean	Median	SD	# Items (mean)	N
FR	Single	Baseline/refreshment	64.48	62.13	16.41	362.28	156
		Panel	59.70	57.92	14.36	337.67	881
	Couple, first respondent	Baseline/refreshment	67.42	66.08	14.87	369.38	197
		Panel	57.56	56.47	13.35	340.48	855
	Couple, second respondent	Baseline/refreshment	46.55	45.68	13.64	279.80	117
		Panel	43.21	42.30	10.11	276.08	625
GR	Single	Panel	51.39	50.62	18.99	304.22	881
		Baseline/refreshment	40.47	35.03	18.86	312.00	11
	Couple, first respondent	Panel	49.86	50.38	18.68	310.81	1114
		Baseline/refreshment	29.64	28.60	9.58	242.44	18
	Couple, second respondent	Panel	36.92	36.63	15.27	245.92	1057
HR	Single	Baseline/refreshment	43.31	41.12	16.04	334.14	630
		Panel	40.49	38.31	13.76	311.20	684
	Couple, first respondent	Baseline/refreshment	43.77	41.05	14.75	346.23	881
		Panel	43.07	42.31	14.23	322.40	878
	Couple, second respondent	Baseline/refreshment	27.94	25.82	9.79	254.65	789
		Panel	30.42	29.41	10.37	252.11	790
HU	Single	Baseline/refreshment	39.87	37.23	18.07	323.54	117
		Panel	43.33	44.68	16.90	309.39	417
	Couple, first respondent	Baseline/refreshment	43.92	41.18	18.96	332.74	167
		Panel	44.78	44.15	17.77	316.69	443
	Couple, second respondent	Baseline/refreshment	30.81	27.57	15.45	255.21	183
		Panel	32.02	30.72	13.83	248.70	358
IL	Single	Baseline/refreshment	54.89	52.92	12.47	364.83	6
		Panel	41.76	41.93	11.36	321.04	221
	Couple, first respondent	Baseline/refreshment	50.49	50.77	5.87	386.00	19
		Panel	41.99	43.30	10.53	332.60	277
	Couple, second respondent	Baseline/refreshment	38.14	38.57	7.51	283.53	19
		Panel	30.86	30.73	8.22	266.34	191
IT	Single	Baseline/refreshment	52.14	52.14	19.34	348.00	2
		Panel	37.89	35.86	15.22	310.83	932
	Couple, first respondent	Baseline/refreshment	42.94	34.75	16.93	334.27	15
		Panel	37.85	35.63	14.72	315.29	1341
	Couple, second respondent	Baseline/refreshment	31.39	29.07	14.55	250.69	51
		Panel	25.63	24.33	10.24	249.26	1218

Country	Interview version	Sample	Mean	Median	SD	# Items (mean)	N
LT	Single	Baseline/refreshment	56.39	53.08	18.50	344.13	80
		Panel	48.03	46.43	14.50	312.37	484
	Couple, first respondent	Baseline/refreshment	55.84	54.60	12.36	348.09	66
		Panel	49.13	46.18	14.78	319.29	377
	Couple, second respondent	Baseline/refreshment	38.15	38.43	8.80	258.54	72
		Panel	34.55	33.39	10.18	246.74	316
LU	Single	Panel	48.48	47.97	11.34	320.85	191
	Couple, first respondent	Baseline/refreshment	64.56	70.55	22.13	344.20	5
		Panel	48.33	48.68	10.92	327.50	373
	Couple, second respondent	Baseline/refreshment	28.45	27.67	11.67	247.63	24
		Panel	31.76	31.75	11.34	253.65	215
LV	Single	Baseline/refreshment	42.37	39.28	13.50	330.55	222
		Panel	38.27	35.82	14.38	298.81	369
	Couple, first respondent	Baseline/refreshment	39.76	35.23	13.70	334.76	234
		Panel	36.08	32.45	14.71	305.91	299
	Couple, second respondent	Baseline/refreshment	26.95	24.85	8.02	253.87	237
		Panel	24.92	21.67	10.10	241.48	277
MT	Single	Baseline/refreshment	44.68	44.14	13.46	328.04	48
		Panel	39.36	38.00	14.98	300.43	135
	Couple, first respondent	Baseline/refreshment	46.86	46.16	14.14	340.86	94
		Panel	38.13	38.00	11.47	309.35	259
	Couple, second respondent	Baseline/refreshment	27.39	27.35	9.50	249.09	93
		Panel	24.35	23.38	8.17	240.77	234
NL	Single	Panel	65.99	64.70	14.97	342.70	555
	Couple, first respondent	Baseline/refreshment	69.75	72.28	10.12	368.86	22
		Panel	63.97	63.03	14.38	345.16	830
	Couple, second respondent	Baseline/refreshment	53.15	52.62	13.36	288.21	29
		Panel	46.29	45.43	11.83	279.39	595
PL	Single	Baseline/refreshment	45.71	44.47	14.65	346.69	563
		Panel	42.48	40.73	13.32	317.71	845
	Couple, first respondent	Baseline/refreshment	44.21	43.62	13.26	351.30	855
		Panel	43.23	42.15	12.76	324.23	985
	Couple, second respondent	Baseline/refreshment	29.76	28.92	9.52	260.71	700
		Panel	31.16	30.23	9.72	253.34	836

Country	Interview version	Sample	Mean	Median	SD	# Items (mean)	N
RO	Single	Baseline/refreshment	34.39	33.13	11.75	336.15	115
		Panel	33.34	31.05	13.76	300.92	331
	Couple, first respondent	Baseline/refreshment	35.67	35.08	11.98	338.81	136
		Panel	34.82	33.28	12.40	306.23	382
	Couple, second respondent	Baseline/refreshment	23.92	23.25	8.17	249.71	140
		Panel	24.82	22.28	9.76	240.88	355
SE	Single	Baseline/refreshment	84.21	85.13	15.39	384.33	21
		Panel	71.92	70.93	18.32	345.95	770
	Couple, first respondent	Baseline/refreshment	86.26	87.92	20.53	387.52	27
		Panel	72.12	71.53	16.97	355.01	997
	Couple, second respondent	Baseline/refreshment	63.13	60.65	14.30	288.67	30
		Panel	54.72	53.75	13.46	282.51	573
SI	Single	Baseline/refreshment	49.02	47.32	15.55	341.41	206
		Panel	41.81	39.93	12.20	314.70	999
	Couple, first respondent	Baseline/refreshment	50.25	48.13	15.23	355.86	483
		Panel	42.80	40.92	12.18	324.09	1284
	Couple, second respondent	Baseline/refreshment	32.12	29.98	11.04	261.15	320
		Panel	30.10	28.77	9.05	252.50	986
SK	Single	Baseline/refreshment	41.39	34.28	19.84	316.81	37
		Panel	51.19	49.57	17.54	306.09	210
	Couple, first respondent	Baseline/refreshment	40.55	38.34	13.05	323.75	60
		Panel	43.13	39.80	18.32	302.32	349
	Couple, second respondent	Baseline/refreshment	28.03	26.19	10.07	250.09	58
		Panel	33.62	29.07	14.05	245.62	337
Total	Single	Baseline/refreshment	55.43	53.28	21.92	347.93	4205
		Panel	52.40	51.07	18.74	323.93	17174
	Couple, first respondent	Baseline/refreshment	56.00	54.07	21.01	358.05	5978
		Panel	52.44	51.42	18.27	331.05	19583
	Couple, second respondent	Baseline/refreshment	36.00	32.84	15.46	264.56	4532
		Panel	36.87	35.68	14.27	260.58	15196

Note: The sample is restricted to completed interviews (End-of-Life interviews are excluded); cases with missing keystroke information are not considered.
SD=standard deviation, N=Number of observations.

CHAPTER 8

Weights and Imputations in SHARE Wave 9

08

8 WEIGHTS AND IMPUTATIONS IN SHARE WAVE 9

Giuseppe De Luca and Paolo Li Donni

8.1 Introduction

This chapter describes the weighting and imputation strategies used for dealing with problems of unit nonresponse, sample attrition, and item nonresponse in the most recent SHARE studies: the ninth regular wave of SHARE and the second wave of the SHARE Corona Survey. The remainder of the chapter is organized as follows. Section 8.2 provides a brief overview of the key features of these two studies that are relevant for the purposes of our weights and imputation strategies. Section 8.3 focuses on the construction of calibrated survey weights that attempt to compensate for the potential selection effects generated by unit nonresponse and attrition, while Section 8.4 focuses on the construction of (multiple) imputations for the missing values due to item nonresponse errors.

8.2 Overview of SHARE Main Wave 9 and SHARE Corona Survey 2

8.2.1 SHARE Main Wave 9

The ninth regular wave of SHARE was fielded between October 2021 and September 2022 by means of a Computer-Assisted Personal Interview (CAPI) administered in the same 28 countries that had already participated in the eighth regular wave of the SHARE panel. Ignoring the End-of-Life interviews, SHARE Wave 9 collected data from 69,154 individual interviews in 47,957 households. The sample size available in each country ranges from a minimum of 731 observations for Cyprus and a maximum of 4,802 observations for Poland.

As discussed in Chapter 2, the uncertainty generated by the ongoing COVID-19 pandemic in 2021 prevented the drawing of new refreshment samples. Hence, the gross sample of Wave 9 can be viewed as a follow-up of the sample originally drawn in Wave 8. Note that, in addition to the longitudinal samples from previous waves and the national refreshment samples from batches that were already fielded in Wave 8, it also includes national refreshment samples from batches that were not fielded before the suspension of the Wave 8 fieldwork due to the COVID-19 outbreak in spring 2020.

In total, there are 18 countries that have drawn a refreshment sample in Wave 8: Austria, Belgium, Croatia, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Israel, Latvia, Poland, Portugal, Slovenia, Spain, Sweden, and Switzerland. The target population of Wave 9 has been defined as the 50+ population in 2019 that survives up to 2021 (i.e., the beginning of the data collection process in Wave 9) because the national gross samples of all these countries cover cohorts of people born in 1969 or earlier who were already age-eligible at the time of the latest refreshment samples in Wave 8. As for other longitudinal studies, this definition of the target population accounts for the sizeable effects of mortality between Wave 8 and Wave 9. It excludes cohorts of people born in 1970 and 1971, who were aged respectively 50 and 51 years in 2021, that are not covered by the national gross samples due to the lack of new refreshment samples in Wave 9. The representativeness of the cohorts of people born in 1968 and 1969 remains problematic for the ten countries (Bulgaria, Cyprus, Greece, Italy, Lithuania, Luxembourg, Malta, the Netherlands, Romania, and Slovakia) that have not drawn refreshment samples in Wave 8. Issues related to the coverage of these cohorts will be addressed in the refreshment samples of Wave 10.

In Section 8.3, we shall see that these survey design features have important implications on the calibrated weights of Wave 9. For example, unlike the other regular waves of SHARE, the calibrated cross-sectional weights of Wave 9 and the calibrated longitudinal weights of the wave combination 8 – 9 aim to reproduce the same target population. These two different sets of calibrated weights differ only in relation to their subsamples of respondents and their sets of population margins.

8.2.2 SHARE Corona Survey 2

The second wave of the SHARE Corona Survey was designed to study the long-term impact of the COVID-19 pandemic. It was fielded about one year later than the first wave, between June and August 2021, by means of a Computer-Assisted Telephone Interview (CATI) administered in the same 28 countries that had already participated in the first wave of this study.

The first wave of this study collected data from 57,560 individual interviews in 38,960 households, while its second wave involved 49,254 individual interviews in 33,109 households.[16] The cross-country average household attrition rate is 15 percent, with the lowest retention rate of 68 percent in Sweden and the highest retention rate of 94 percent in Lithuania. About 2 percent of the interviews in the second wave refer to new entries such as new spouses/partners of age-eligible respondents and nonresponding spouses/partners from the first wave that were eligible for the second wave. The balanced sample of respondents who have participated in both waves of the study includes 48,357 individuals.

By design, the first wave was administered to the longitudinal sample of Wave 8, but not to the refreshment sample. The sample of the second SHARE Corona Survey is a follow-up of those households that participated in the first SHARE Corona Survey, without refreshment samples in any of the participating countries. Unlike release 8.0.0, the target population of the first wave has been re-defined as the 50+ population in 2016 (i.e., the time of the latest baseline/refreshment samples drawn in Wave 7) that survives up to 2020 (i.e., the beginning of the data collection process in the first SHARE Corona Survey). Similarly, the target population of the second SHARE Corona Survey is defined as the 50+ population in 2016 that survives up to 2021.

8.3 Weighting Strategies

In the ideal situation of complete responses, design weights may allow one to account for the randomness of the sampling process by compensating for the unequal selection probabilities of the various sampling units. Unfortunately, the properties of inferential procedures based on the design weights depend strongly on this ideal assumption, which is almost never satisfied in practice. SHARE is not an exception to this common situation: the baseline/refreshment samples of each wave suffer from problems of unit nonresponse and the longitudinal part of the sample is also subject to problems of attrition. From this viewpoint, it is important to stress that design weights are included in the SHARE release 9.0.0 only to allow the comparison and development of alternative procedures for dealing with unit nonresponse and attrition errors, but we usually discourage users to rely on these weights for standard analyses of the SHARE data.

The basic strategy adopted by SHARE for handling problems of unit nonresponse and sample attrition is the calibration approach of Deville and Särndal (1992), which is summarized in the appendix. This choice is primarily motivated by the fact that, in addition to external auxiliary information on the target population of interest, this approach requires the availability of design weights and auxiliary variables only for the subsample of respondents (but not for the nonresponding units). Moreover, it allows aligning the sample and population marginal distributions of some benchmark variables without specifying an explicit model for the response process. Under the standard missing-at-random assumption, calibrated weights may help reduce the potential selection effects due to different sources of sampling and nonsampling errors. This is therefore the set of weights that we generally recommend using in standard analyses of the SHARE data.

The next subsections provide further information on the calibrated weights available in the SHARE release 9.0.0. Specifically, Section 8.3.1 describes the calibrated cross-section weights of SHARE Wave 9, while Section 8.3.2 describes the calibrated longitudinal weights for selected wave combinations of the SHARE panel. Section 8.3.3 focuses on the calibrated weights for the first two waves of the SHARE Corona Survey, while finally, Section 8.3.4 presents a few additional remarks on the supplementary material for the calibrated weights.

8.3.1 Calibrated Cross-sectional Weights of SHARE Wave 9

The calibrated cross-sectional weights of SHARE wave 9 were computed separately by country to match the size of the national 50+ populations in 2019 that survive up to 2021. In each country, we used a logit specification of the calibration function $F(\cdot)$ and a set of population margins for gender-age groups (i.e., males and females in the age classes ([50 − 59], [60 − 69], [70 − 79], [80+]). Mortality of the target population was taken into account by subtracting from each population margin the corresponding number of deaths between 2019 and 2021. Table 8.1 in the appendix shows the resulting set population margins separately by country.

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16 The second SHARE Corona Survey also includes 1,216 End-of-Life interviews which are ignored in the construction of weights and imputations.

Figure 8.1: NUTS1 Population Margins for the Calibrated Cross-Sectional Weights of Wave 9
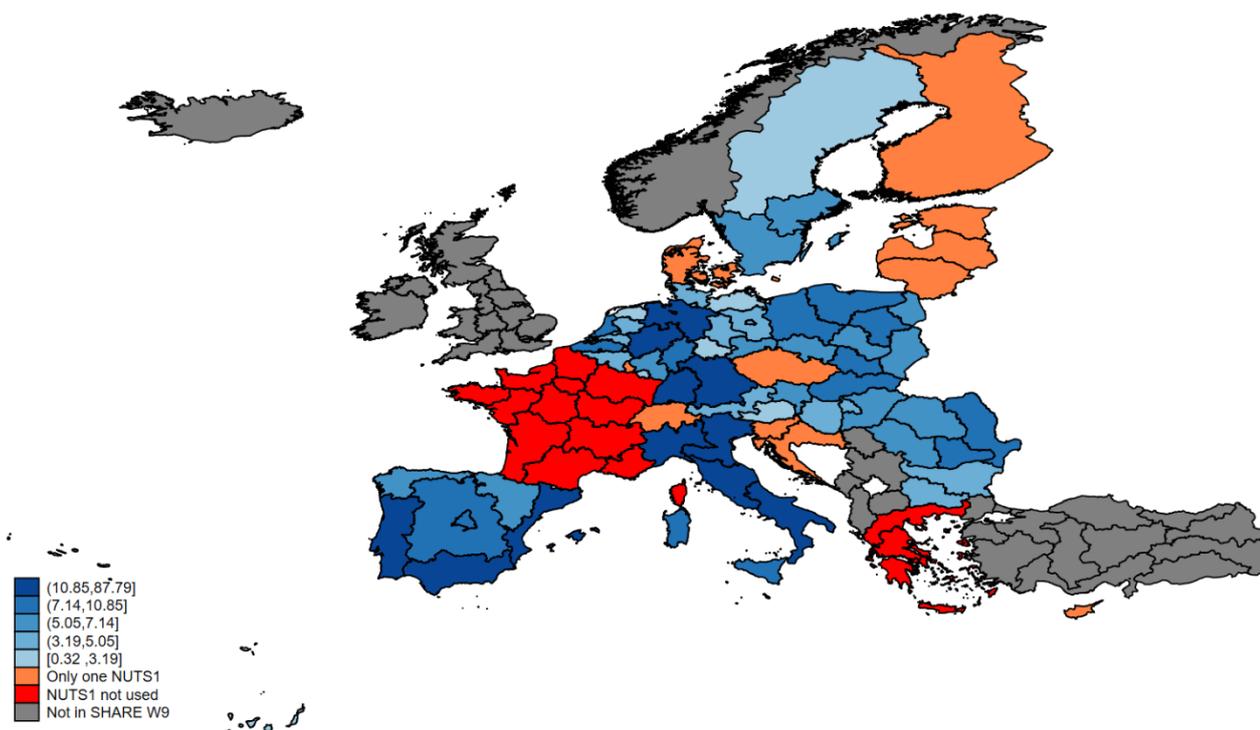
In 12 countries (Austria, Belgium, Bulgaria, Germany, Hungary, Italy, the Netherlands, Poland, Portugal, Romania, Spain, and Sweden), we included an additional set of population margins for the 2016 NUTS1 regional areas as illustrated in Figure 1 (Israel is excluded from the figure). This additional set of calibration margins was ineffective in all countries containing only one NUTS1 region.[17] In Greece, NUTS1 calibration margins were excluded because of unsolved inconsistencies in the recoding of NUTS1 codes over time. In Israel, where no NUTS nomenclature is available, we used instead an additional set of calibration margins for three population groups: Jewish Israeli, Arab Israeli, and immigrants from the former USSR. Population data about the calibration margins come from the Central Bureau of Statistics for Israel and the EUROSTAT regional database for all other countries.

As usual, calibrated cross-sectional weights are computed at the individual level for inference to the target population of individuals and at the household level for inference to the target population of households. At the individual level, we assigned an individual-specific weight to each 50+ respondent that depends on the household design weight and the respondent's set of calibration variables (namely, gender, age class, and NUTS1 code). At the household level, we assigned instead a common calibrated weight to all interviewed

household members which depends on the household design weight and the set of calibration variables for all 50+ respondents in that household.

By construction, calibrated cross-sectional weights are missing for respondents younger than 50 years (i.e., age-ineligible partners of an age-eligible respondent), for those with missing information on the calibration variables, and for those with missing sampling design weights (i.e., respondents from households for which we do not have sampling frame information). However, the number of these cases is negligible.

8.3.2 Calibrated Longitudinal Weights of the SHARE Panel

In addition to calibrated cross-sectional weights, the SHARE release 9.0.0 also includes calibrated longitudinal weights for the purposes of panel data analyses. Although these weights are based on the same calibration procedure, they differ from the cross-sectional weights in two important respects. First, calibrated longitudinal weights are usually computed for the balanced subsample of respondents who have participated in at least two waves of the study. Second,

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17 That is the case in Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Latvia, Lithuania, Luxembourg, Malta, Slovakia, Slovenia, and Switzerland.

since mortality is a source of attrition that affects both the sample and the population, calibrated longitudinal weights aim to reproduce the target population at the beginning of a reference period that survives up to the end of the period considered (see, e.g., Lynn, 2009). As discussed in Section 8.2.1, SHARE Wave 9 is somehow an exception. Due to the lack of new refreshment samples in Wave 9, its target population coincides with that reproduced by the calibrated longitudinal weights of the wave combination 8 – 9. However, these two sets of calibrated weights differ in relation to their subsamples of respondents and their sets of population margins.

To simplify the structure of the public release of the data, we still provide calibrated longitudinal weights only for selected wave combinations of the SHARE panel. Those available in the SHARE release 9.0.0 are the 8 possible couples of any two adjacent waves (i.e., the wave combinations 1 – 2, 2 – 3, 3 – 4, 4 – 5, 5 – 6, 6 – 7, 7 – 8, and 8 – 9) and the fully balanced panel (i.e., the wave combination 1 – 2 – 3 – 4 – 5 – 6 – 7 – 8 – 9). The weights of the generic wave combination $t - \cdots - s$ were always computed separately by country to represent the national 50+ populations of Wave t that survive up to the interview year of Wave s. For example, the wave combination 1 – 2 allows representing the 50+ national populations in 2004 that survive up to 2006, while the fully balanced panel allows representing the national 50+ populations in 2004 that survive up to 2021.

For the calibrated longitudinal weights of two adjacent waves, we used a logit specification of the calibration function $F(\cdot)$ and a set of calibration margins for the size of the target population across eight gender-age groups (i.e., males and females with age at the time of the starting wave in the four classes [50 – 59], [60 – 69], [70 – 79] and [80+]). Compared to the cross-sectional weights of previous waves, we did not control for the 2016 NUTS1 calibration margins due to the smaller number of observations usually available in the national longitudinal subsamples. Moreover, we always accounted for the mortality of the target population by subtracting from each calibration margin the corresponding number of deaths between Waves t and s. The gender-age population margins of the wave combination 8 – 9 coincides with those presented in Table 8.1 (see appendix). Those of the other wave combinations can be found in the SHARE methodology books of previous waves (available at the SHARE-ERIC website www.share-eric.eu/).

For the calibrated longitudinal weights of the fully balanced panel, we further restricted the set of calibration margins to the six gender-age groups reported in Table 8.2 (i.e., males and females with age in 2004 in the three classes [50 – 59], [60 – 69], and [70+]; see appendix).

As with the calibrated cross-sectional weights, calibrated longitudinal weights are available both at the individual level and at the household level. For the individual weights, the balanced sample consists of respondents interviewed in each wave of the selected wave combination. For the household weights, the balanced sample consists of households with at least one eligible member interviewed in each wave of the selected wave combination. These definitions imply that the balanced sample of households is larger than the balanced sample of individuals. For example, couples with one partner participating in Wave 8 and the other partner participating in Wave 9 belong to the balanced sample of households for the wave combination 8 – 9, even though none of the two partners belongs to the corresponding balanced panel of individuals.

8.3.3 Calibrated Cross-sectional and Longitudinal Weights of the SHARE Corona Survey

The SHARE release 9.0.0 includes two sets of calibrated cross-sectional weights for the first two waves of the SHARE Corona Survey and a set of calibrated longitudinal weights for the balanced panel of respondents who participated in both waves of the study.

A description of the calibrated cross-sectional weights for the first SHARE Corona Survey can be found in De Luca et al. (2021). As for release 8.0.0, the new release 9.0.0 includes separate sets of calibrated weights for the CAPI, CATI, and CAPI&CATI subsamples. The target population of the last two subsamples has been however redefined as the 50+ population in 2016 that survives up to 2020. As usual, the calibrated cross-sectional weights of each subsample were computed separately by country using a logit specification of the calibration function, a first set of population margins for the gender-age groups (i.e., males and females in the age classes classes [50 – 59], [60 – 69], [70 – 79], [80+]), and a second set of population margins for the 2016 NUTS1 regional areas. The country-specific population margins of the gender-age groups are presented in Table 8.3 (see appendix). The weights of each subsample were also defined at the individual level for inference to the target population of individuals and at the household level for inference to the target population of households.

For the calibrated cross-sectional weights of the second SHARE Corona Survey, we maintained the distinction between individual-level and household-level weights, but not the distinction between the CAPI, CATI, and CAPI&CATI subsamples. These weights were computed for the cross-sectional sample of 49,254 respondents and 33,109 households who participated in the CATI of the second wave, irrespective of whether they also participated in the CATI of the first wave. The population margins are like those of the calibrated cross-section weights of the first wave, but they

now refer to the national 50+ populations in 2016 that survive up to 2021 (see Table 8.4 in the appendix).

Calibrated longitudinal weights were computed for the balanced panel of 48,357 respondents and 33,109 households who participated in the first and second SHARE Corona Survey. Compared to the two cross-sectional samples, this sample excludes the 9,203 respondents who participated only in the first and the 897 respondents who participated only in the second SHARE Corona Survey. The target population coincides with that of the second wave, but the calibrated longitudinal weights were constructed by controlling for the population margins of the gender-age groups only.

8.3.4 Supplementary Material and User Guide on Calibrated Weights

Since the SHARE panel now consists of nine waves, one can compute many different types of calibrated longitudinal weights depending on the selected combination of waves and the selected unit of analysis (either individuals or households). In addition, one can compute many different types of calibrated cross-sectional weights for specific subsamples of the data collected in each regular wave of the panel or other related studies, such as the SHARELIFE interviews of waves 3 and 7 or the two waves of the SHARE Corona Survey. These considerations make it clear why the strategy of providing all possible calibrated cross-sectional and longitudinal weights is not feasible, especially in the future when additional waves will be available. For cross-sectional studies based on specific subsamples and longitudinal studies based on other wave combinations, users are required to control for the potential selection effects of unit nonresponse and attrition by computing their own calibrated weights or by implementing some alternative correction methods.

To support users in the nontrivial methodological task, we provide a set of Stata do-files and ado-files that illustrate step-by-step how to compute calibrated cross-sectional and longitudinal weights. Our supplementary material on calibrated weights also includes a dataset with updated information on population size and number of deaths by year, gender, age, and NUTS1 code. Registered users can download this supplementary material on calibrated weights from the SHARE data dissemination website, under the link "Generate Calibrated Weights Using Stata (2020)". A discussion of these step-by-step operations can also be found in the accompanying user guide "Computing Calibrated Weights".

8.4 Imputations

Let us now consider the imputation strategies employed to deal with the missing values generated by item nonresponse errors. Section 8.4.1 focuses on the imputations of missing values in SHARE Main Wave 9, while Section 8.4.2 focuses on the imputations of missing values in the SHARE Corona Survey 2.

8.4.1 Imputations of Missing Values in SHARE Main Wave 9

Imputations of missing values due to item non-response errors in the regular face-to-face interview of Wave 9 were constructed using the same general procedure adopted in the previous regular waves of SHARE (see, e.g., De Luca et al., 2015). However, we adapted the imputation model to the specific features of the Main Wave 9 interview in terms of branching, skip patterns, proxy interviews, country-specific deviations from the generic version of the questionnaire, and availability of partial information from the sequence of unfolding bracket questions. Moreover, we also attempted to preserve as much as possible the comparability of the imputations across different waves of the SHARE panel. The imputation procedure is essentially based on either the hot-deck method or the fully conditional specification (FCS) method, depending on the prevalence of missing values for the variables collected in the Main Wave 9 interview.

Hot-deck Imputations
In SHARE, we use the hot-deck method for variables affected by negligible fractions of missing values (usually, much less than 5 percent of the respondents eligible to answer a specific item on the CAPI questionnaire). This method consists of replacing the missing values in one or more variables for a non-respondent (called the recipient) with the observed values in the same variables obtained from a respondent (called the donor) who is "similar" to the recipient according to some metric (see, e.g., Andridge and Little, 2010).

In Main Wave 9, we computed hot-deck imputations in an early stage, separately by country, and according to a convenient order that accounts for branching and skip patterns in the various modules of the CAPI questionnaire. Donors were selected randomly within imputation classes based on observed auxiliary variables. We imputed first basic socio-demographic characteristics such as age and year of education, which contained very small fractions of missing values. These characteristics were then used as auxiliary variables to impute other variables. Our baseline set of auxiliary variables consisted of country, gender, five age classes ([– 49], [50 – 59], [60 – 69], [70 – 79], [80+]), five groups for years of education ([– 5], [6–10], [11–15], [16–20], [21+]), and two groups for self-reported good/bad health. For some var-

iables, we exploited a larger set of auxiliary variables. For example, we also used the number of children to impute the number of grandchildren and an indicator for being hospitalized overnight during the last year to impute other health-related variables. Variables that are known to be logically related, such as respondent's weight, height, and body mass index, were imputed jointly.
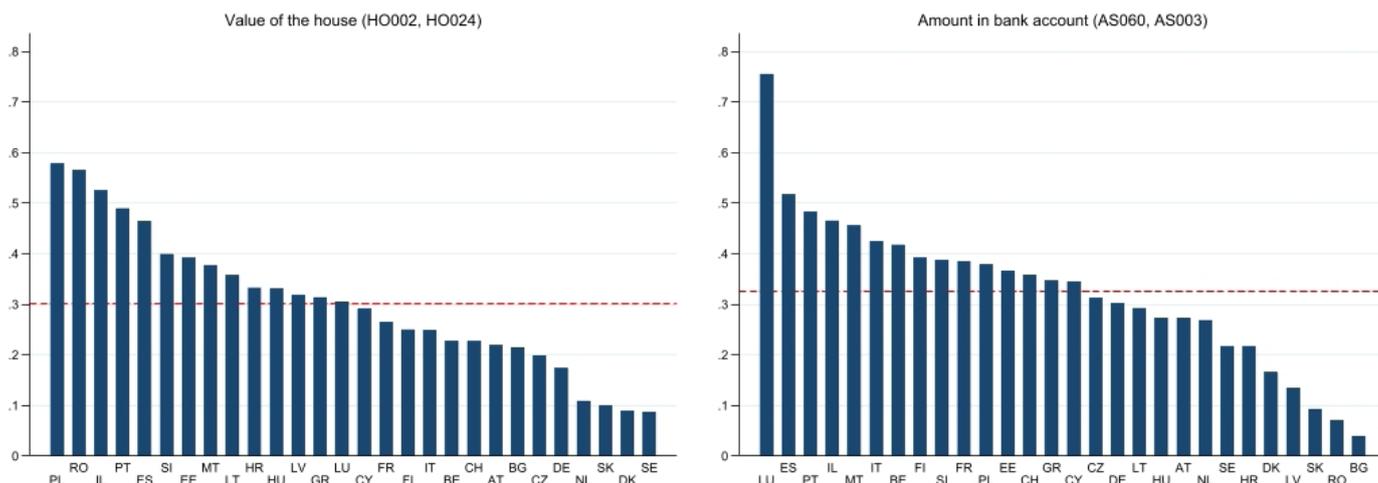
FCS Imputations
In the second stage of the imputation procedure, we dealt with the more worrisome issue of item non-response in monetary variables, such as income from various sources, real and financial assets, and consumption expenditures, which were collected by retrospective and open-ended questions that are sensitive and difficult to answer precisely.

Figure 8.2 shows the item non-response rates of two monetary variables: "Value of the house" (HO002, HO024), and "Amount in bank accounts" (AS060, AS003). For the first variable, the percentage of missing values among the eligible respondents ranges from a minimum of 8 percent in Denmark and Sweden to a maximum of 57 percent in Poland (30 percent on average). For the second variable, the item non-response rate ranges from a minimum of 4 percent in Bulgaria to a maximum of 76 percent in Luxembourg (32 percent on average). Similar patterns of item non-response were also observed in the previous waves

(see, for example, De Luca et al., 2021). Thus, item non-sampling errors show some degree of persistency both over time and over country.

Since Wave 1, we handled these sizeable fractions of missing values on monetary variables by the FCS method of van Buuren et al. (1999). This method exploits a Gibbs sampling algorithm that imputes a set of variables jointly and iteratively through a sequence of regression models. Assume we want to impute arbitrary patterns of missing values on a set of J variables. At each step of the iterative process, we impute the missing values on the jth variable (j=1,…,J) by drawing from the predictive distribution of a regression model that includes as predictors the most updated imputations of the other J-1 variables (as well as other fully observed predictors). The process is applied sequentially to the whole set of J variables and is repeated in a cyclical manner by overwriting at each iteration the imputed values computed in the previous iteration. Despite a lack of rigorous theoretical justification (see, e.g., Arnold et al., 1999, 2001; van Buuren, 2007), the FCS method is one of the most popular multivariate imputation procedures due to its flexibility in handling complicated data structures and its ability to preserve the correlations of the imputed variables (Raghunathan et al., 2001; van Buuren et al., 2006). Comparisons of the FCS method with other multivariate imputation techniques can be found in Lee and Carlin (2010).

Figure 8.2: Item Nonresponse Rates for "Value of the House" and "Amount in Bank Accounts" by Country

In Main Wave 9, we computed FCS imputations separately by country and household type. The household types considered were singles and third respondents (*sample 1*), couples with both partners interviewed (*sample 2*), and all couples with and without a non-responding partner (*sample 3*). The distinction between the first two samples was primarily motivated by the fact of using socio-demographic characteristics of the partner of the designed respondent as additional predictors to impute the missing monetary amounts within couples. The overlapping partition of the last two samples was instead motivated by the need to impute properly total household income in the couples with a non-responding partner.

The set of monetary variables imputed jointly with the Gibbs sampling algorithm was country- and sample-specific as we required a minimum number of donor observations for estimating the regression model associated with each variable.[18] Variables that did not satisfy this requirement were imputed first (either by hot-deck or by regression imputations) and then used as fully observed predictors for computing the FCS imputations of missing values in the other monetary variables.

The imputation of each monetary variable was typically based on a two-stage model that involved a probit model for ownership and a linear regression model for the amount conditional on ownership.[19] Depending on eligibility and ownership, we converted (if needed) non-zero values of monetary variables in annual Euro amounts to avoid modelling differences in the time reference periods of the various variables and the national currencies of non-Euro countries.

In an early stage of the imputation process, we also symmetrically trimmed 2 percent of the complete cases from the country-specific distribution of annual Euro amounts to exclude (and then impute) outliers that may have a large influence on survey statistics. Moreover, we applied logarithm or inverse hyperbolic sine transformations to reduce skewness in the right tails of the conditional distribution of each monetary variable[20].

The set of fully observed predictors was also sample-specific. For singles and third respondents (*sample 1*), our set of predictors consists of gender, age, years of education, self-perceived health, number of children, number of chronic diseases, score of the numeracy test, employment status, and willingness to answer (as perceived by the interviewer in the IV module of the CAPI instrument). For couples with both partners interviewed (*sample 2*), we added a similar set of predictors for the partner of the designed respondent. For couples with a non-responding partner (those remaining in *sample 3* after excluding the couples in *sample 2*), we restricted the additional set of predictors referring to the non-responding partner to age and years of education only.[21]

Imputations of the monetary amounts were always constrained to fall within individual-level bounds that incorporated the partial information available on the missing observations (e.g., country-specific thresholds used to trim outliers in the tails of the observed distribution of each monetary variable, bounds obtained from the sequence of unfolding bracket questions asked by design to non-respondents of open-ended monetary variables and lower bounds based on the observed components of aggregated monetary variables).

As usual, the imputation of total household income received special attention because the CAPI questionnaire provides two alternative measures of this variable. The first measure (*thinc*) can be obtained by a suitable aggregation at the household level of all individual income components, while the second (*thinc2*) can be obtained via the one-shot question on monthly household income (HH017). As argued by De Luca et al. (2015), it is not easy to find strong arguments to prefer one measure over the other. Moreover, the availability of two alternative measures may greatly improve the imputation process because each measure could contribute relevant information on the missing values of the other measure. To avoid understating the first measure of total household income in couples with a non-responding partner, we adopted the following three-stage algorithm:

> **Stage 1.** For singles and third respondents (*sample 1*), we imputed first all monetary variables by the FCS method as discussed above. At the end of each iteration of the Gibbs sampling algorithm, we also computed total household income (*thinc*), household net worth *(hnetw)*, and total household expenditure (*thexp*) by suitable aggregations of the imputed income, wealth, and expenditure items. Next, we imputed the second measure of total household income (*thinc2*) using as predictors *thinc*, *hnetw*, *thexp*, and

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18 The minimum number of observations was equal to 100 in sample 1 and 150 in samples 2 and 3.
19 For the few variables without an ownership question, such as food at home expenditure (CO002) and total household income (HH017), we used a simple linear regression model.
20 We apply the log transformation to variables with positive support and the inverse hyperbolic sine transformation to variables that may take negative values (e.g., income from self-employment, bank account, and value of own business).
21 In the few cases where the number of donor observations available in the estimation step was lower than 30, we employed a smaller subset of predictors, namely gender, age, years of education, and self-reported health.

the set of socio-demographic characteristics of the household respondent. The imputed values of *thinc2* were constrained to fall in the bounds derived from the sequence of unfolding bracket questions for the variable HH017.

Stage 2. For couples with both partners interviewed (*sample 2*), the imputation strategy is similar to the one adopted in stage 1 for the sample of singles and third respondents (*sample 1*). The only difference is that, at each iteration of the Gibbs sampling algorithm, we employed a larger set of predictors that also included the socio-demographic characteristics and the most updated imputations of the monetary variables of the partner of the designed respondent.

Stage 3. Imputations of all monetary variables for the subsample of couples with both partners interviewed were obtained in stage 2. In stage 3, these couples were included in the imputation sample only as donor observations to impute the missing values in monetary variables for the remaining subsample of couples with a non-responding partner. As before, we imputed first all monetary variables for the responding partners using the FCS method. Unlike stage 2, the predictors referring to the non-responding partner now consisted, however, of age and years of education only. At the end of each iteration of the Gibbs sampling algorithm, we also imputed the *thinc2* using *hnetw*, *thexp*, and socio-demographic characteristics of the responding partner as predictors and the bounds obtained from the sequence of unfolding bracket questions for the variable HH017. Finally, we imputed thinc using *thinc2*, *hnetw*, *thexp*, and the set of socio-demographic characteristics of the responding partner as predictors, couples with two partners interviewed as donors, and the sum of imputed individual income sources of the responding partner as a lower bound.

To account for the additional variability generated by the imputation process, we provide five imputations of the missing values by independent replications of the hot-deck and FCS methods. Notice that neglecting this additional source of uncertainty by selecting only one of the five available replicates in the generated dataset of imputations may result in misleadingly precise estimates. After an initial set of burn-in iterations, convergence of the Gibbs sampling algorithm for FCS imputations was assessed by the Gelman-Rubin criterion (see, e.g., Gelman and Rubin, 1992, and Gelman et al., 2004) applied to the mean, the median, and the 90th percentile of the five imputed distributions of each monetary variable.

8.4.2 Imputations of Missing Values in the SHARE Corona Survey 2

Since item nonresponse rates in the CATI data of the Second SHARE Corona Survey were generally much less than 5 percent, most variables were imputed by the hot-deck method. We used the FCS method only for 15 variables collected in Section E (Economic situation) and Section W (Work) of the questionnaire administered in the second wave. As for SCS1, the variables collected in these two sections suffer from somewhat larger amounts of item nonresponse. Moreover, Section E contains missing data by design due to the presence of a filter in the routing (see De Luca et al., 2021). Regarding possible issues of data comparability across the first and the second SHARE Corona Survey, we note that seemingly similar questions may present relevant differences in terms of question wording, answer categories, time-reference period, branching, and skip patterns. To mark these differences within the generated dataset of imputations, we assigned slightly different variable names to items whose comparability is more doubtful.

Hot-deck Imputations
We first computed hot-deck imputations separately by country and according to a convenient order of the variables that accounts for branching and skip patterns in the CATI questionnaire of the second wave. The imputation classes for this method were generally based on the following set of auxiliary variables: country, gender, five age classes ([– 49], [50– 59], [60– 69], [70 – 79], [80+]), a binary indicator for respondents living with a spouse/partner, five groups for years of education ([– 5], [6–10], [11–15], [16–20], [21+]), a binary indicator for good self-perceived health, and a binary indicator for changes in the self-perceived health status during the last three months.[22] The first four auxiliary variables are fully observed, while the last three auxiliary variables contain very small fractions of missing values that were imputed first using only the first four variables. For some variables, we employed a larger set of auxiliary variables. For example, we used one additional binary indicator for keeping distance from others in public when imputing several variables included in Section H (Health and health behaviour), Section C (Corona-related infection), and Section Q (Quality of healthcare) of the CATI questionnaire of the second SHARE Corona Survey. Furthermore, we jointly imputed missing values of the variables that are logically related. For example, we jointly imputed variables related to illness or health conditions since the last interview (CAH004) in Section H, those related to the COVID-19 symptoms (CAC102, CAC103) in Section C, and those related to forwent medical treatment

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22 The information on years of education was obtained from the most recent CAPI data collected in the regular waves of SHARE.

since the outbreak (CAQ105 and CAQ106) in Section Q. In total, we imputed sequentially about 200 variables. As for the hot-deck imputations of the CAPI data collected in the regular SHARE waves, the imputation databases of the first and the second SHARE Corona Survey contain five multiple imputations of the missing values and a flag variable for each imputed variable, which allows users to identify the imputed observations.

FCS Imputations

After hot-deck imputations, we constructed FCS imputations for fifteen variables: four of them related to changes in hours of work (namely CAW121, CAW122, CAW124, and CAW125), and the other eleven related to changes in the financial situation of the household (namely CAE100, CAE105, CAE107, CACO107, CAE111, CAE112, CAE103,

and CAE104). As shown in Figure 8.3, the two most worrisome variables are the lowest (CAE107) and the highest (CAE105) overall amounts of monthly household income after taxes and contributions. In particular, the first respondent of each household was first asked whether monthly household income had been the same every month since the last interview (CAE100). Respondents who provided a negative answer to this question were then asked to report the lowest and the highest overall amount of monthly household income. The unweighted cross-country average of the item nonresponse rates for these two variables are 53 and 51 percent, respectively. In Luxembourg, Israel, Cyprus, and Malta, where the item nonresponse rates are around 90 percent, we adopted a country-pooling strategy to increase the extremely low number of donors.[23]

Figure 8.3: Item Nonresponse Rates for Lowest and Highest Overall Monthly Household Income by Country

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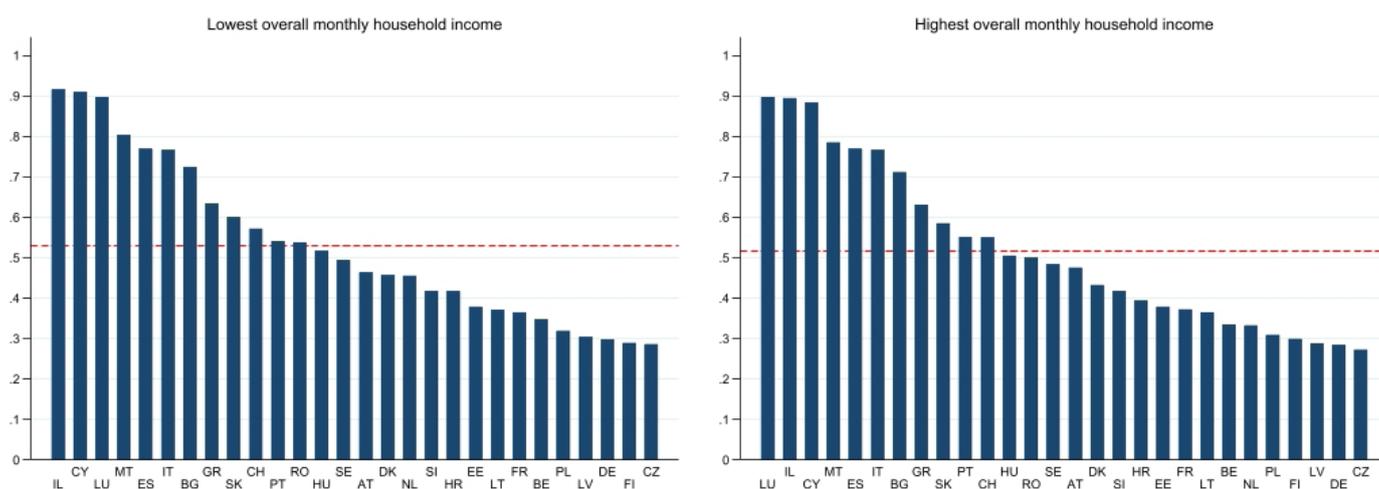
23   Specifically, we increased the number of donors by pooling Malta with Italy, Cyprus with Greece, Luxembourg with both Belgium and the Netherlands, and Israel with all other European countries.

Except for these more problematic cases, FCS imputations were constructed separately by country. At each iteration of the Gibb sampling algorithm, we used a linear regression model for the continuous variables (CAE105 and CAE107), a simple hot-deck method for the lowest and the highest hours of work (CAW122 and CAW125), a logit model for five binary variables (CAW121, CAW124, CAE100, CAE111, and CAE112), a multinomial logit model for the categorical variable CACO107, and a multivariate hot-deck method for the six binary indicators related to financial support received since the outbreak of the pandemic (CAE103 and CAE104). For the variables CAE105 and CAE107, we symmetrically trimmed 2 percent of the complete cases from the country-specific distribution of each variable to exclude (and then impute) outliers that may have a large influence on survey statistics. In addition to the variables imputed jointly within the Gibb sampling, our baseline set of observed predictors consists of age, years of education, and binary indicators for female respondents, living with a spouse/partner, and good self-perceived health. For all variables of Section E, we also used a binary indicator for being retired. For the variables imputed by either simple or multivariate hot-deck methods, all continuous predictors within the Gibb sampling were discretized to form the imputation classes. In some cases, we imposed a set of country- and item-specific exclusion restrictions to avoid possible problems of collinearity, imprecise estimates, and convergence problems in the context of non-linear models. As for the other types of imputations provided by SHARE, we always provide five multiple imputations of the missing values. After an initial set of burn-in iterations, convergence of the Gibbs sampling algorithm was assessed by the Gelman – Rubin criterion applied to the mean, median, and 90th percentile of the distribution of each continuous variable and the mean of the distribution of each discrete variable.

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APPENDIX

Table 8.1: Gender-age Population Margins for the Calibrated Cross-sectional Weights of Wave 9 and the Longitudinal Weights of Waves 8-9

Country	Men				Women				Total
	[50-59]	**[60-69]**	**[70-79]**	**[80+]**	**[50-59]**	**[70-79]**	**[60-69]**	**[80+]**	
AT	685,340	461,937	325,998	123,942	686,610	506,881	412,500	222,857	3,426,065
BE	793,962	630,772	387,164	183,509	787,172	666,687	467,759	326,934	4,243,959
BG	457,078	405,776	238,029	81,483	470,241	505,399	378,070	164,265	2,700,341
CH	641,999	448,773	310,744	132,226	632,659	468,383	364,876	224,335	3,223,995
CY	53,082	44,783	27,965	10,353	54,592	47,222	32,988	14,863	285,848
CZ	656,982	617,225	375,945	105,560	648,816	701,720	528,147	221,220	3,855,615
DE	6,731,208	4,914,177	3,384,703	1,807,698	6,685,991	5,273,764	4,098,271	3,050,914	35,946,726
DK	397,067	316,838	245,718	80,616	394,397	331,083	277,040	129,108	2,171,867
EE	80,707	66,245	35,416	14,635	88,723	91,223	67,289	45,067	489,305
ES	3,392,398	2,445,652	1,626,734	836,157	3,468,783	2,673,512	2,020,060	1,486,861	17,950,157
FI	362,575	342,088	230,952	84,904	364,457	368,454	283,069	158,951	2,195,450
FR	4,245,922	3,687,740	2,339,133	1,157,572	4,476,548	4,155,613	2,875,030	2,181,218	25,118,776
GR	705,218	583,989	421,097	246,435	782,048	667,962	524,756	357,557	4,289,062
HR	279,379	252,297	132,707	52,278	295,085	290,652	198,331	112,325	1,613,054
HU	575,738	544,451	287,483	92,341	620,259	711,482	480,236	233,180	3,545,170
IL	403,051	339,665	198,837	87,840	424,112	383,298	243,479	134,756	2,215,038
IT	4,514,206	3,410,822	2,543,552	1,236,337	4,713,506	3,751,864	3,102,241	2,190,314	25,462,842
LT	192,243	134,684	71,227	31,897	225,036	195,438	145,808	92,876	1,089,209
LU	45,320	29,436	16,515	7,000	41,875	29,554	18,998	12,445	201,143
LV	121,961	94,058	50,755	19,700	143,723	136,922	106,464	63,077	736,660
MT	29,859	28,862	18,794	6,244	28,711	29,410	21,902	10,633	174,415
PL	2,262,420	2,239,510	960,991	381,485	2,385,769	2,727,782	1,486,890	906,503	13,351,350
PT	1,206,983	1,084,184	528,781	229,121	1,220,036	1,352,443	817,677	451,340	6,890,565
RO	647,257	542,678	440,297	160,803	631,981	552,696	478,621	253,024	3,707,357
SE	151,920	131,963	69,625	27,806	149,092	138,066	91,484	59,247	819,203
SI	342,438	299,902	132,279	40,281	355,856	362,136	213,564	96,928	1,843,384
SK	685,340	461,937	325,998	123,942	686,610	506,881	412,500	222,857	3,426,065

Table 8.2: Gender-age Population Margins for the Longitudinal Weights of the Fully Balanced Panel (Waves 1-9)

Country	Men			Women			Total
	[50-59]	[60-69]	[70+]	[50-59]	[60-69]	[70+]	
AT	379,050	237,429	43,660	433,645	327,882	103,694	1,525,360
BE	533,138	270,010	62,093	587,102	369,793	149,900	1,972,036
CH	410,876	223,289	49,922	438,326	284,517	110,289	1,517,219
DE	4,047,658	3,106,488	623,620	4,462,982	4,062,234	1,300,948	17,603,930
DK	303,041	148,036	22,104	325,012	185,908	52,476	1,036,577
ES	1,961,861	1,104,283	281,005	2,290,760	1,593,952	658,554	7,890,415
FR	3,112,718	1,548,742	461,584	3,614,349	2,154,995	1,114,092	12,006,480
IT	2,994,456	1,882,995	381,023	3,384,385	2,593,872	934,061	12,170,792
SE	528,640	276,188	53,184	550,267	331,073	115,289	1,854,641

Table 8.3: Gender-age Population Margins for the Calibrated Cross-sectional Weights of the SHARE Corona Survey 1

Country	Men				Women				Total
	[50-59]	[60-69]	[70-79]	[80+]	[50-59]	[60-69]	[70-79]	[80+]	
AT	637,866	417,832	281,282	86,511	647,778	470,086	368,118	172,444	3,081,917
BE	775,927	590,542	324,454	130,053	778,267	635,176	415,517	254,297	3,904,233
BG	455,181	390,366	194,602	56,042	483,161	510,731	322,957	113,894	2,526,934
CH	606,363	422,558	264,036	93,488	595,799	449,237	323,006	172,686	2,927,173
CY	51,520	41,531	23,019	6,510	53,722	44,629	27,709	10,060	258,700
CZ	649,368	608,454	279,703	73,414	657,256	718,311	420,401	165,254	3,572,161
DE	6,351,644	4,304,875	3,183,899	970,594	6,377,015	4,748,270	4,087,726	1,886,272	31,910,295
DK	375,143	315,119	197,057	51,648	375,312	332,606	231,240	92,513	1,970,638
EE	79,069	59,430	30,157	9,146	91,564	87,293	63,806	31,283	451,748
ES	3,166,767	2,239,962	1,406,427	626,791	3,260,050	2,492,484	1,825,440	1,180,199	16,198,120
FI	361,707	342,827	176,741	56,248	367,590	376,644	231,207	118,382	2,031,346
FR	4,148,876	3,590,836	1,867,857	843,581	4,426,446	4,074,812	2,418,113	1,714,987	23,085,508
GR	670,778	557,650	379,700	171,774	752,838	642,214	493,750	253,767	3,922,471
HR	285,171	228,636	115,448	32,748	305,874	274,353	184,851	77,543	1,504,624
HU	559,830	505,231	234,902	63,160	630,608	685,435	426,715	167,490	3,273,371
IL	378,698	318,856	155,380	60,535	405,109	364,304	197,397	97,559	1,977,838
IT	4,250,255	3,346,875	2,225,989	865,784	4,484,039	3,719,901	2,847,202	1,689,294	23,429,339
LT	190,228	114,689	66,478	20,836	231,282	178,040	144,672	65,367	1,011,592
LU	40,908	25,880	13,712	4,899	38,370	26,287	16,924	9,556	176,536
LV	122,877	81,928	45,631	12,066	149,653	128,742	104,832	42,842	688,571
MT	29,681	27,649	14,125	3,872	29,526	29,043	17,443	7,425	158,764
NL	1,206,766	992,292	527,420	156,221	1,203,965	1,018,612	615,614	291,328	6,012,218
PL	2,409,916	1,993,489	738,169	264,958	2,605,739	2,522,699	1,256,881	670,998	12,462,849
PT	672,599	541,235	343,108	122,188	759,000	651,620	488,444	251,516	3,829,710
RO	1,107,833	979,861	459,954	151,305	1,188,438	1,266,455	761,680	301,473	6,216,999
SE	609,338	543,045	361,950	110,367	598,517	560,211	406,527	191,559	3,381,514
SI	149,534	118,974	59,029	18,260	148,238	128,100	83,651	44,784	750,570
SK	347,489	263,160	101,331	27,080	370,518	333,425	179,838	68,457	1,691,298

Table 8.4: Gender-age Population Margins for the Calibrated Cross-sectional Weights of the SHARE Corona Survey 2 and the Calibrated Longitudinal Weights of the SHARE Corona Survey 1 and the SHARE Corona Survey 2

Country	Men				Women				Total
	[50-59]	[60-69]	[70-79]	[80+]	[50-59]	[60-69]	[70-79]	[80+]	
AT	633,144	409,391	267,017	71,558	645,350	464,974	356,675	146,827	2,994,936
BE	770,086	578,734	307,017	106,992	774,901	627,990	401,297	216,740	3,783,757
BG	445,567	372,335	175,978	42,822	478,750	499,993	303,913	92,182	2,411,540
CH	603,331	416,589	253,099	78,120	594,095	445,566	314,566	149,276	2,854,642
CY	51,151	40,889	21,982	5,419	53,548	44,267	26,906	8,514	252,676
CZ	642,244	590,359	258,976	58,017	653,935	708,239	402,041	136,776	3,450,587
DE	6,351,644	4,304,875	3,183,899	970,594	6,377,015	4,748,270	4,087,726	1,886,272	31,910,295
DK	372,552	309,298	187,847	43,012	373,615	328,709	223,672	80,036	1,918,741
EE	77,891	57,532	28,199	7,599	91,093	86,224	61,544	27,033	437,115
ES	3,143,113	2,198,491	1,338,825	526,131	3,248,419	2,472,262	1,776,831	1,025,173	15,729,245
FI	358,951	336,683	168,425	47,641	366,302	373,109	224,627	103,168	1,978,906
FR	4,114,631	3,525,947	1,786,943	715,862	4,408,662	4,039,762	2,358,742	1,507,573	22,458,122
GR	664,823	546,126	361,242	145,764	749,908	636,155	478,187	215,569	3,797,774
HR	281,563	221,336	106,940	26,009	304,296	270,445	175,770	64,058	1,450,417
HU	549,220	484,796	216,140	50,728	625,266	671,979	404,624	139,064	3,141,817
IL	424,664	352,130	237,761	114,705	441,737	391,704	280,984	167,068	2,410,752
IT	4,223,885	3,288,099	2,113,838	720,360	4,468,949	3,686,305	2,760,311	1,453,787	22,715,534
LT	186,445	109,665	60,996	16,705	229,761	175,220	138,315	54,877	971,984
LU	40,628	25,430	13,065	4,093	38,255	26,019	16,405	8,336	172,231
LV	120,641	78,574	41,974	9,705	148,658	126,674	100,093	35,962	662,281
MT	29,477	27,174	13,449	3,271	29,412	28,786	16,923	6,432	154,924
NL	1,199,649	975,597	500,125	128,108	1,198,865	1,007,045	594,385	248,245	5,852,019
PL	2,370,911	1,921,576	680,242	213,200	2,588,726	2,481,567	1,200,171	568,492	12,024,885
PT	666,208	530,372	325,511	100,045	756,326	645,828	473,191	215,473	3,712,954
RO	1,084,217	937,163	417,871	119,931	1,178,578	1,241,689	717,539	248,849	5,945,837
SE	606,031	534,751	345,984	91,260	596,542	554,605	394,058	164,440	3,287,671
SI	148,277	116,316	55,548	14,758	147,675	126,781	80,655	37,733	727,743
SK	342,573	254,381	93,433	21,807	368,352	328,272	171,212	57,307	1,637,337

The calibration approach of Deville and Särndal (1992)

Let $U = \{1, ..., i, ..., N\}$ be a finite population of N elements, from which a probability sample $s = \{1, ..., i, ..., n\} \subseteq U$ of size $n \leq N$ is drawn according to a probability-based sampling design. Unless otherwise specified, we shall assume that the inclusion probability $\pi_i = \mathrm{Pr}\,(i \in s)$ is known and strictly positive for all population units. To describe the basic ideas and the key properties of the calibration approach, we consider first the ideal situation of complete response where all units in the sample s agree to participate to the survey. Then, we relax this ideal setup to describe the key implications of non-response errors on the properties of this weighting method.

The sampling design weights $w_i = \pi_i^{-1}$ are typically used to account for the randomness of the sampling process and the variability of the inclusion probabilities across sample units due to stratification and clustering strategies (additional details can be found in Chapter I.1). For example, one can estimate the population total $t_y = \sum_{i \in U} y_i$ of a variable of interest y by the Horvitz-Thompson estimator:

$$\hat{t}_y = \sum_{i \in s} w_i y_i. \tag{1}$$

Under the ideal setup of complete response, this estimator is known to be design unbiased, that is $E_p(\hat{t}_y) = t_y$, where $E_p(\cdot)$ denotes the expectation with respect to the sampling design.

Let us assume now that the sampling frame or other external sources such as census data and administrative archives provide supplementary data on a q-vector of categorical auxiliary variables $x_i = (x_{i1}, ..., x_{iq})^\top$ with known population totals $t_x = \sum_{i \in U} x_i$. We shall refer to the auxiliary variables x_i as calibration variables and to their population totals t_x as calibration margins. The basic idea of the calibration approach is to determine a set of *calibrated weights* w_i^* that are as close as possible to the design weights w_i and that satisfy the constraints

$$\sum_{i \in s} w_i^* x_i = t_x. \tag{2}$$

Thus, given a distance function $G(w_i^*, w_i)$ and the availability of survey data on $(w_i, x_i^\top : i = 1, ..., n)$ and population data on the calibration margins t_x, the aim of the procedure is to determine the calibrated weights w_i^* by minimizing the aggregate distance $\sum_{i \in s} G(w_i^*, w_i)$ with respect to w_i^* subject to the q equality constraints in (2). Under some regularity conditions on the distance function $G(w_i^*, w_i)$ (see Deville and Särndal 1992), the solution of this constrained optimization problem exists, is unique and can be written as

$$w_i^* = w_i F(\eta_i), \qquad i = 1, ..., n, \tag{3}$$

where $\eta_i = x_i^\top \lambda$ is a linear combination of the calibration variables x_i, $\lambda = (\lambda_1, ..., \lambda_q)^\top$ is the q-vector of Lagrangian multipliers associated with the constraints (2), and $F(\cdot)$ is a calibration function, which is uniquely determined by the distance function $G(w_i^*, w_i)$.

A key feature of the calibration approach is that many traditional re-weighting methods such as post-stratification, raking, and generalized linear regression (GREG) correspond to special cases of the calibration estimator

$$\hat{t}_y^* = \sum_{i \in s} w_i^* y_i \tag{5}$$

for particular choices of the calibration function $F(\cdot)$ (or, equivalently, of the distance function $G(\cdot, \cdot)$). Table 1 in Deville and Särndal (1992) presents various functional forms for $G(w_i^*, w_i)$ and $F(\eta_i)$. The chi-square distance function $G(w_i^*, w_i) = (w_i^* - w_i)^2 / 2w_i$, which leads to the widely used GREG estimator, has the advantage of ensuring a closed form solution for the calibrated weights w_i^*. However, this distance function is unbounded and depending on the chosen set of calibration variables it may also lead to negative weights. Different specifications of the calibration function may avoid these issues, but the underlying optimization problems may not admit a solution and the Lagrange multipliers must be computed numerically. In SHARE, we rely on the logit specification of the distance function

$$G(w_i^*, w_i) \propto \left(\frac{w_i^*}{w_i} - l\right) \ln\left(\frac{w_i^*/w_i - l}{1 - l}\right) + \left(u - \frac{w_i^*}{w_i}\right) \ln\left(\frac{u - w_i^*/w_i}{u - 1}\right),$$

which leads to a calibration function of the form

$$F(\eta_i; u, l) = \frac{l(u - 1) + u(1 - l)\exp(a\eta_i)}{u - 1 + (1 - l)\exp(a\eta_i)},$$

where $a = [(1 - l)(u - 1)]^{-1}(u - l)$. Unlike other distance functions, these functional forms restrict in advance the range of feasible values for the calibrated weights by suitable choices of the lower bound l and the upper bound u. Specifically, if a solution exists, then it must satisfy the restriction $w_i l \leq w_i^* \leq w_i u$.

As discussed in Deville and Särndal (1992), effectiveness of the calibrated weights depends crucially on the correlation between the study variable y and the calibration variables x. In the extreme case when y can be expressed as a linear combination of x, it is clear that the calibrated estimator $\hat{t}_y^*$ gives an exact estimate of t_y for every realized sample s. Under suitable regularity conditions, the class of calibration estimators $\hat{t}_y^*$ satisfies other desirable asymptotic properties. For example, the estimators obtained by alternative specifications of the distance function are asymptotically equiva-

lent to the GREG estimator based on a chi-squared distance function. Thus, in large samples, calibrated weights are robust to arbitrary choices of the calibration function $F(\cdot)$.

Unfortunately, this property does not necessarily extend to the more realistic cases where survey data are affected by nonresponse errors. Previous studies by Lundström and Särndal (1999) and Haziza and Lesage (2016) suggest that in these cases alternative specifications of the calibration function $F(\cdot)$ correspond in practice to imposing different parameterization of the relationship between response and calibration variables. Moreover, statistical properties of calibration estimators depend as usual on the validity of the missing at random assumption.

CHAPTER 9

The Fourth Round of the SHARE Interviewer Survey

09
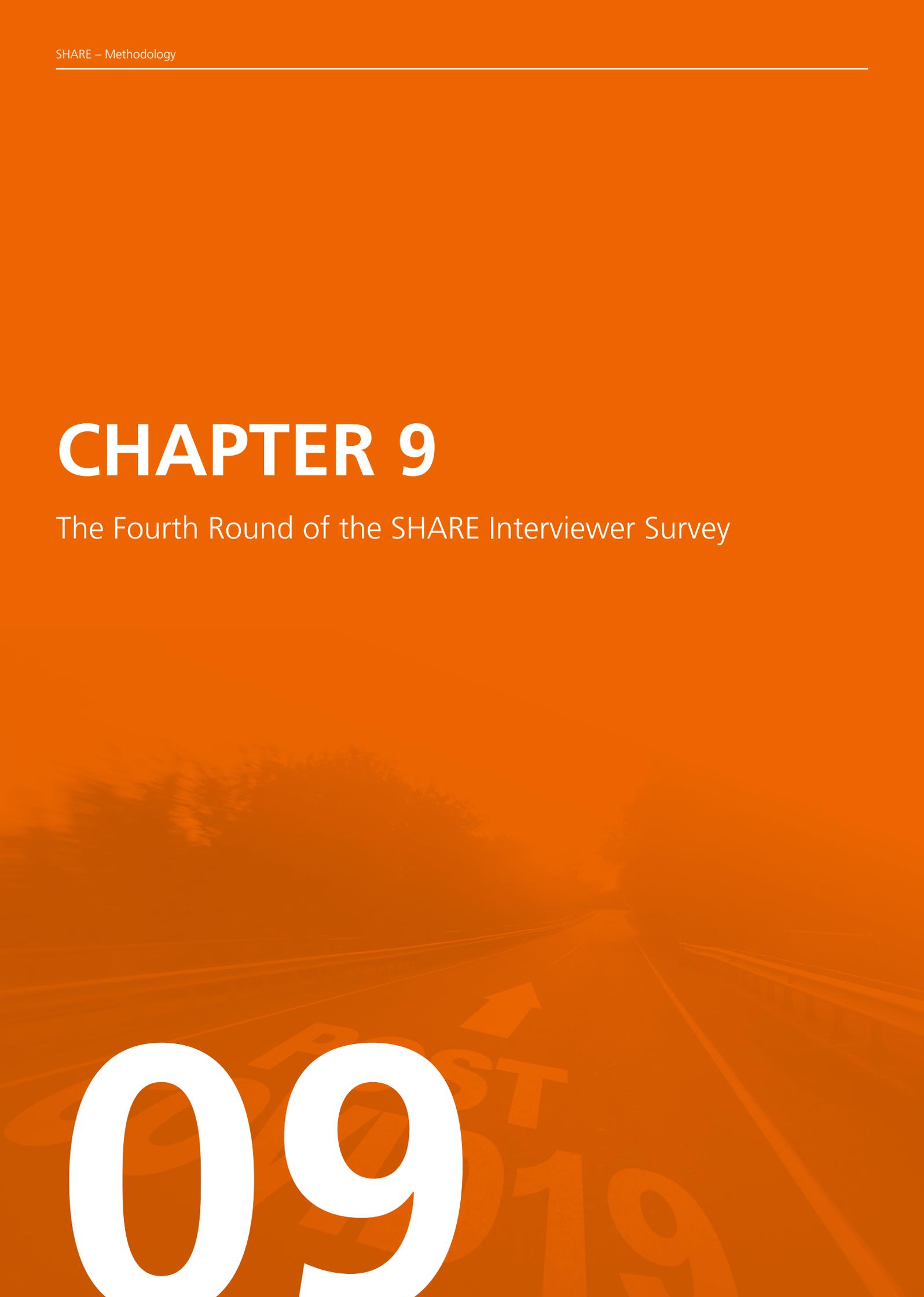
9 THE FOURTH ROUND OF THE SHARE INTERVIEWER SURVEY

Magdalena Quezada, Tessa-Virginia Hannemann and Michael Bergmann

9.1 The Importance of Interviewers

Interviewers play a very important role in all interviewer-mediated surveys. They are the link between the researchers who design and conduct a survey and the data that result from the survey. The interviewer is responsible for most of the fieldwork tasks. Interviewers must establish contact with respondents, convince them to take part in the survey, administer the survey, record the respondent's answers accurately, check and edit the data if necessary, and answer any questions that arise during the interview. Furthermore, interviewers may conduct specific measurements or tests and lay the foundation for successful future contacts in a panel survey (Groves & Couper, 1998; Schaeffer et al., 2010).

However, the way in which interviewers carry out these different tasks varies and can lead to different interviewer effects. The term "interviewer effect" describes the bias of survey outcomes that are due to the interviewer. Such effects can be observed when respondents who are interviewed by the same interviewer answer questions more similarly than respondents interviewed by different interviewers (Blom & Korbmacher, 2013). As a result, data quality may be affected by such differences in interviewer performance.

Despite the essential role of interviewers, researchers know very little about them. A wide body of literature exists about identifying interviewer effects, but researchers still have relatively little knowledge about their process of formation. Recognising the importance of more detailed information to understand and explain interviewer effects in the survey process, SHARE implemented an interviewer survey to address the lack of information and to provide researchers with the opportunity to investigate interviewer effects in depth in SHARE. Further, the data can be used by survey agencies and country teams to inform interviewer trainings.

9.2 Interviewer Effects in Surveys

Interviewer effects can occur at different stages of a survey. Figure 9.1 gives an overview of the three main aspects that are prone to interviewer effects.

Figure 9.1: Types of Interviewer Effects in Surveys
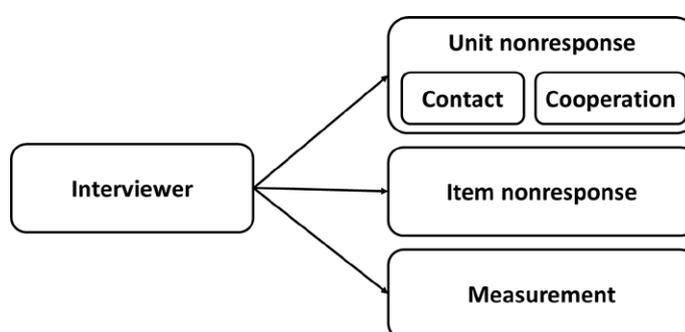
Note: Adapted from Blom and Korbmacher (2013).

A large body of literature discusses interviewer effects on contact and cooperation rates (e.g., Blom et al., 2011; Durrant et al., 2010; Groves & Couper, 1998; Hox & De Leeuw, 2002; Jäckle et al., 2013; Lipps & Pollien, 2011; Pickery et al., 2001). Thus, interviewers are differentially successful in recruiting survey participants, consequently affecting unit nonresponse. Research in this area has focused on interviewer attributes, such as experience, interviewer skills or interviewer-respondent interaction, and survey management characteristics, such as interviewer payment or interviewer burden (for an overview see West & Blom, 2017). Researchers who have focused on the attitudes and behaviours of interviewers have found that a positive attitude towards persuasion increases response rates in face-to-face surveys, as shown by De Leeuw et al. (1998) and help to explain variations in refusal rates (Durrant et al., 2010)

Interviewers can also affect the respondents' willingness to answer certain questions (e.g., Pickery & Loosveldt, 2001; Singer et al., 1983). For instance, questions on income, drug use, and sexual behaviour are prone to item nonresponse. Respondents may not be willing to provide information on those kinds of questions because they are too sensitive and intimate (Tourangeau et al., 2000; Tourangeau & Yan, 2007). The way how interviewers handle such situations can influence the respective item nonresponse rates. In addition, privacy concerns might play a role, e.g. with regard to respondent's consent to data linkage (see Herold et al., 2021; Herold et al., 2023).

Moreover, interviewers can affect the substantive answer a respondent gives during the interview or the result of a test. This topic is very complex, and interviewer effects vary for different measurements (Schaeffer et al., 2010). Even the presence of an interviewer, observable characteristics of interviewers, and their actions during the interview can influence the answers that respondents provide in a survey (Groves et al., 2009).

9.3 The SHARE Interviewer Survey in Wave 9

The aim of this project is to provide information on interviewers that can be linked to the SHARE survey data. The SHARE interviewer survey is a separate online survey that collects data on SHARE interviewers prior to the start of fieldwork. So far, the Interviewer Survey was carried out in Waves 5, 6, 7 and 9 in a steadily increasing number of SHARE countries (see Korbmacher et al., 2015; Friedel et al., 2021).

The questionnaire for the SHARE Interviewer Survey was based on the conceptual framework developed by Blom and Korbmacher (2013) that distinguishes four dimensions of interviewer characteristics as possible sources of interviewer effects: (1) interviewer attitudes, (2) interviewers' own behaviour, (3) interviewers' experience, and (4) interviewers' expectations. Since the fifth wave, the questionnaire has been modified by adding specific topics related to the regular SHARE wave or by editing certain questions, but most of the topics asked have remained the same. For Wave 9, in addition to basic demographic data, we collected information on attitudes to surveys in general, perceptions of data protection, older people and interviewer burden. In this wave we also included questions about how the COVID-19 pandemic had affected their work.[24]

The interviewer survey was coordinated centrally at the Munich Center for the Economics of Aging (MEA). In sum, 23 SHARE countries participated in the SHARE Wave 9 Interviewer Survey: Austria (AT), Belgium (BE), Bulgaria (BG), Croatia (HR), Cyprus (CY), Denmark (DK), Germany (DE), Estonia (EE), France (FR), Greece (GR), Hungary (HU), Italy (IT), Lithuania (LT), Luxembourg (LU), Malta (MT), Netherlands (NL), Poland (PL), Portugal (PT), Romania (RO), Slovenia (SI), Slovakia (SK), Spain (ES) and Sweden (SE). The participation of countries in the interviewer survey and the participation of interviewers was voluntary and confidential. In most countries, participation was compensated by a small conditional incentive. The amount of the incentive varied between 5 and 10 Euros.[25] Interviewers were invited to participate at the end of the national interviewer training sessions. Invitation letters were distributed to interviewers by the respec-

tive country teams and included the web link to the survey as well as a unique login code. Interviewers were asked to complete the survey before the start of the Wave 9 fieldwork to ensure that their responses were not influenced by their initial experience in the field. To link the interviewer survey data with the SHARE survey data, interviewers were asked to provide their SHARE interviewer ID at the end of the interviewer survey. The number of interviewers working in each country and participation in the interviewer survey differed among countries (see Table 9.1). In most countries, not all interviewers who participated in the training session also conducted SHARE interviews. For practical reasons, we refer only to interviewers who attended the national training and subsequently worked as SHARE interviewers. Column 2 of Table 9.1 refers to this number and summarises how many interviewers per country worked for the ninth wave of SHARE. The participation rate, which is calculated as the number of interviewers who participated in the SHARE interviewer survey divided by the number of interviewers who conducted interviews for SHARE, varied widely between countries, ranging from 99.2 per cent in Italy to 17 per cent in Croatia.

Table 9.1: Participation in the SHARE Interviewer Survey

Country	Number of interviewers	Number of respondents	Participation Rate (in %)
AT	68	35	51.5
BE_FR	64	37	57.8
BE_NL	48	38	79.2
BG	33	27	81.8
CY	17	7	41.2
DE	160	115	72.3
DK	95	70	73.7
EE	95	71	74.7
ES	75	22	29.3
FR	114	103	90.4
GR	107	35	32.7
HR	106	18	17.0
HU	57	37	64.9
IT	122	121	99.2
LT	38	33	86.8
LU	19	17	89.5
MT	11	5	45.5
NL	80	44	55.0

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24 See the appendix for details of the topics asked in each wave.
25 More detailed information on the incentives for each country can be found in the appendix.

| Country	Number of interviewers	Number of respondents	Participation Rate (in %)
PL	96	70	72.9
PT	68	51	75.0
RO	35	30	85.7
SE	69	34	49.3
SI	62	41	66.1
SK	37	20	54.1
Total	1676	1081	64.5

Note: Two different survey agencies conducted interviews in Belgium (Flemish- and French-speaking). The number of interviewers corresponds to the number of interviewers who have synched in Case CTRL software.
Data: SHARE Interviewer Survey Wave 9, preliminary data.

9.4 Interviewer Characteristics in the SHARE Interviewer Survey

Only if interviewers differ in certain characteristics can these characteristics be used to explain interviewer effects. The figures below show that there is considerable variation in key variables between interviewers and between countries. The first two figures (Figures 9.2 and 9.3) show the variation in interviewer gender and age.
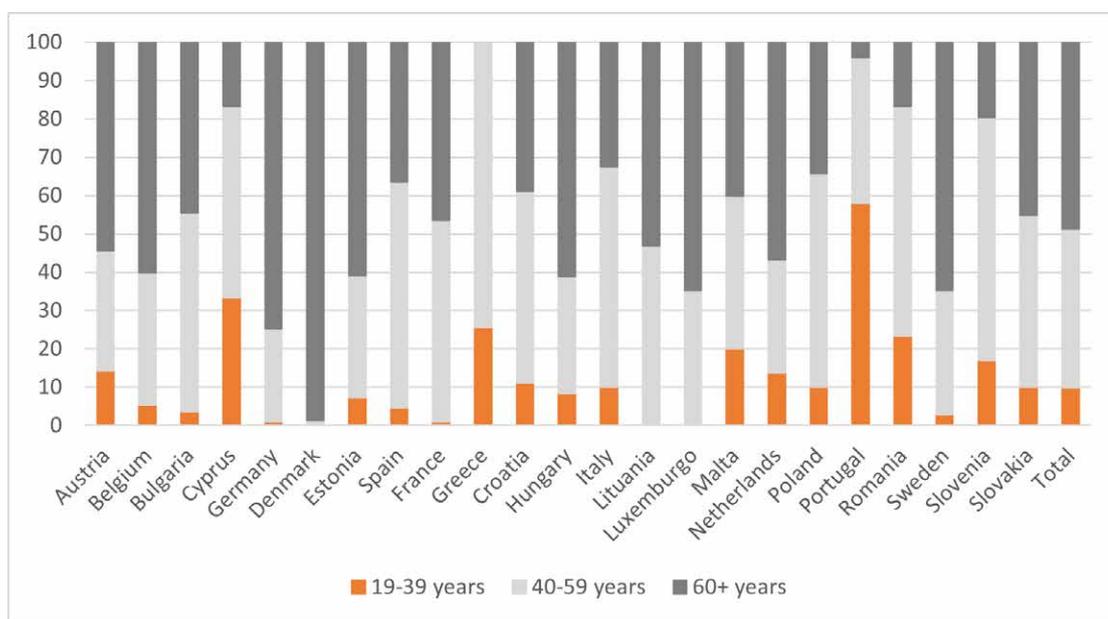
Figure 9.2: Gender Distribution of Interviewers by Country
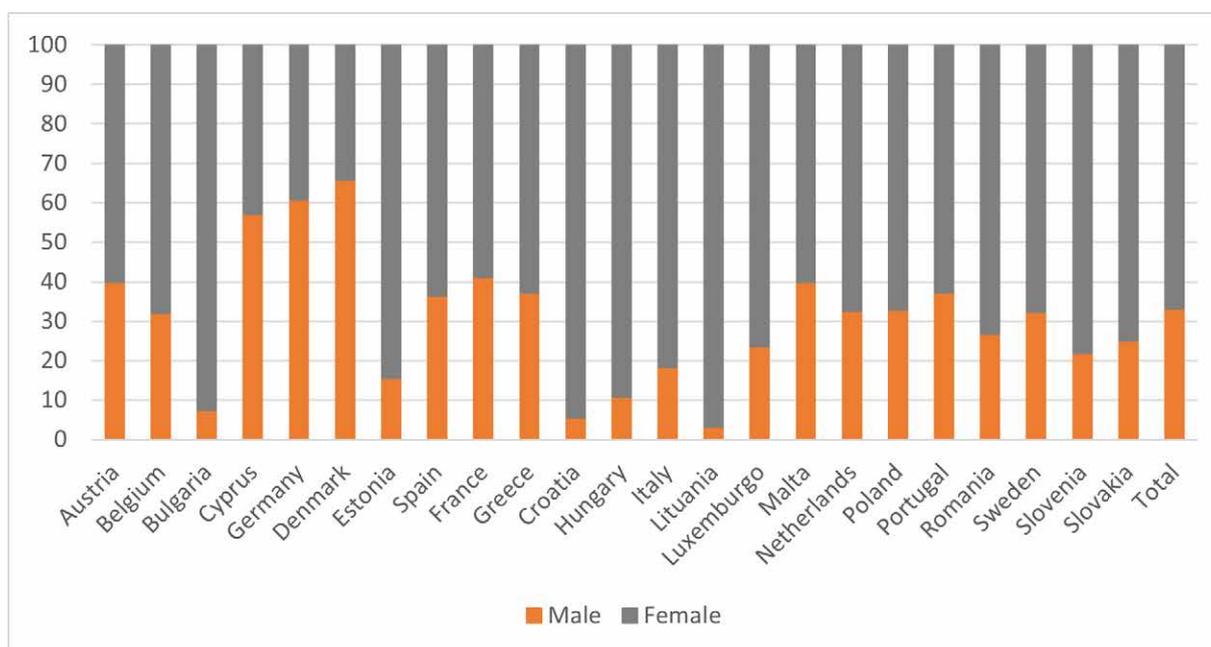
Data: SHARE Interviewer Survey Wave 9, preliminary data.

SHARE interviewers are predominantly female (67 percent). Only three countries have a higher proportion of men than women in their interviewer population: Cyprus, Germany and Denmark.

Figure 9.3: Age Distribution of Interviewers by Country

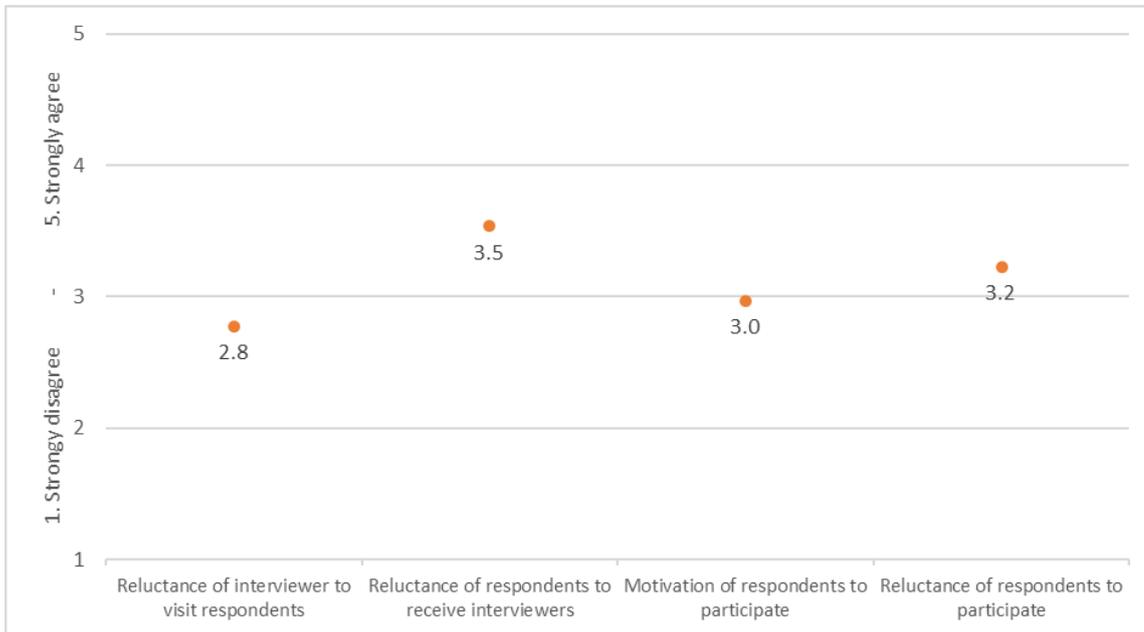Data: SHARE Interviewer Survey Wave 9, preliminary data.

Overall, about half of the interviewers are aged 60 years and over; about 10 percent are between 19 and 39 years old and about 40 percent are between 40 and 59 years old. However, the age distribution varies from country to country (Figure 9.3). Denmark has the oldest interviewer population, with 98 percent of the interviewers being 60 years or older. In contrast, more than half of Portuguese interviewers are aged between 19 and 39, and only 4 percent are aged 60 or over.

Looking more closely at the age distribution of interviewers of both genders, we see that among women the largest group (56 percent) is over 60 years old, while among men both the group aged 40 to 59 and the group over 60 years old each account for 45 percent. These patterns across age, gender, and countries could lead to differential interviewer effects, since respondents may interact differently with interviewers of different gender and age groups (see, e.g., Davis et al., 2010; Rozelle et al., 2023).

9.5   Interviewer Attitudes in the SHARE Interviewer Survey

Even more important for the interaction between interviewers and respondents, and thus for the quality of the survey data, are the interviewers' attitudes towards their work in general and towards the interview process. In Wave 9, the SHARE interviewer survey, among other things, explored interviewers' attitudes to their work in the aftermath of the COVID outbreak. With the onset of quarantines, surveys that collected data using face-to-face interviews, such as SHARE, had to adapt quickly to new modes of collection. As the ninth wave of the SHARE survey returned to face-to-face interviews after two years of contact restrictions due to the pandemic, this can give additional information on the challenges interviewers were facing with respect to respondents' willingness to be interviewed in person.

Figure 9.4: Means of Agreement towards Statements Related to the (Post-COVID-19) Situation

The average agreement with different statements about interview behaviour after COVID-19 on a 5-point scale is plotted in Figure 9.4. Interviewers most strongly agreed to the statement that respondents are more reluctant to receive them in their home for an interview since the outbreak of the pandemic (mean: 3.5). The lowest agreement was found with regard to the statement that interviewers are more reluctant to visit respondents in their home for an interview since the outbreak of the pandemic (mean: 2.8).

The last figure refers to interviewers' attitudes towards reluctant respondents. The questionnaire contains a list of six statements about how interviewers might deal with reluctant respondents. Each statement was rated on a 5-point scale. Agreement was highest for the statement "If caught at the right time, most people will agree to participate", with an average score of 3.9. In contrast, the statement "When a respondent refused because he/she is too busy, it is better to send a different interviewer than have the same interviewer return" with the lowest level of agreement had an average score of 1.9.

Figure 9.5: Means of Agreement towards Persuasion Strategies
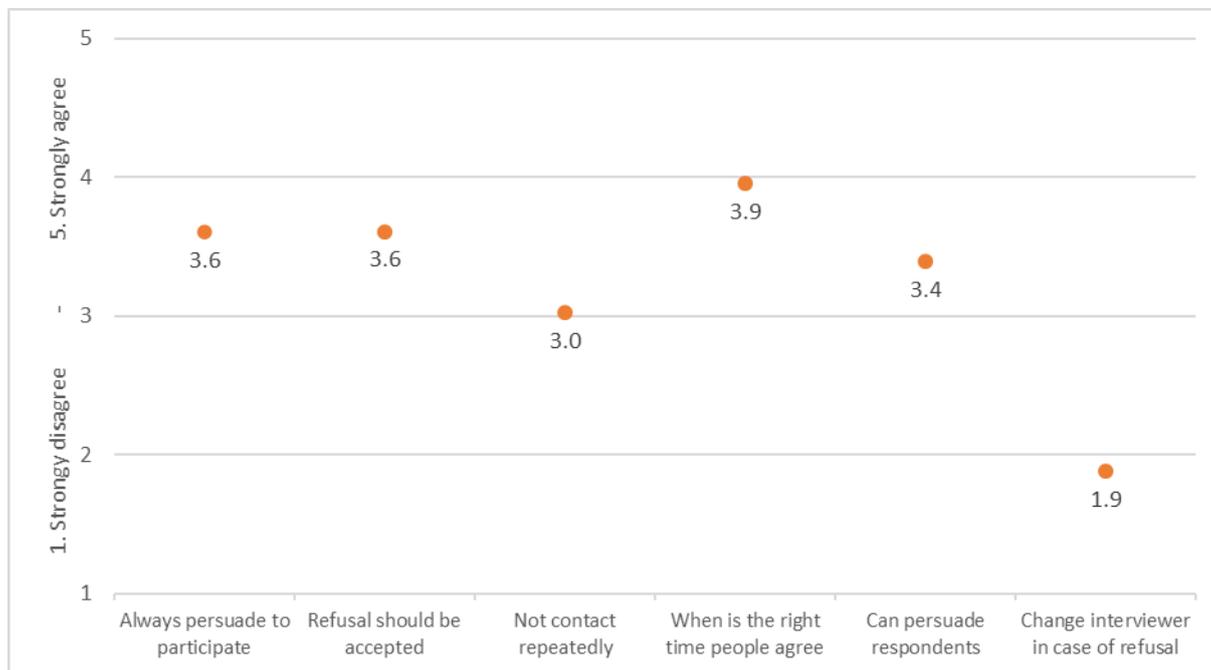
Figure 9.5 shows that interviewers vary in their agreement with the statements presented and thus in their interview be-haviour towards respondents. Interviewers' attitudes towards persuasion and the different strategies they use to persuade respondents to participate in a survey can influence respondents' willingness to cooperate. Given that improving response rates is one of the major challenges facing surveys today, learning more about how persuasion strategies influence partici-pation can be of great interest to researchers and survey managers.

9.6   Concluding Remarks

Interviewers are an important actor within the process of conducting a survey and they can influence the data quality of a survey. The SHARE Interviewer Survey offers the opportunity to analyse and understand interviewer effects. The descriptive comparison of interviewer characteristics, attitudes, and behaviours shows the variation among interviewers within and across countries. This finding is an important prerequisite for the identification of interviewer characteristics that can explain interviewer effects. It gives a good first impression of potential analyses of interviewer effects in SHARE using the interviewer survey data. Information on how to obtain access to the data will be available on the SHARE homepage.

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APPENDIX

Table 9.2: Incentives SHARE Interviewer Survey Wave 9 by Country

Country	Amount of Incentive in Euro
AT	10
BE_FR	10
BE_NL	10
BG	5
CY	10
DE	10
DK	9
EE	10
ES	10
FR	10
GR	10
HR	7
HU	10
IT	10
LT	7
LU	10
MT	10
NL	10
PL	10
PT	10
RO	10
SE	10
SI	10
SK	5

Table 9.3: Cross-wave Topic Comparison

Dimension	Topic Included in the Questionnaire	Wave 5	Wave 6	Wave 7	Wave 9
Interviewer experiences	General working experience	x	x	x	x
	Experience measuring blood sugar levels		x		
	SHARE working experience	x	x	x	x
	Number of working hours	x	x	x	x
	Working radius			x	x
Interviewer attitudes and behaviors	Reasons for being an interviewer	x	x	x	x
	Perception of survey benefits				x
	Interviewer participation in surveys	x	x		
	Interviewing behavior	x	x	x	x
	Persuasion strategies	x	x	x	x
	Trust in people	x	x	x	
	Social desirability	x	x	x	
	Perception of surveys			x	
	BIG 5		x	x	
	Impact of COVID-19 on respondent				x
	Impact of COVID-19 on interviewer				x
	Interviewer burden				x
	Need for cognition				x
	Age bias				x
	Consent to data linkage	x	x	x	
	Concerned about personal data	x	x	x	x
	Willing to provide personal data	x	x		
Interviewer perceptions about (non)participation	Reasons for respondents to participate	x	x	x	x
	Reasons for respondents to refuse			x	x
Interviewer expectations	Respondent consent to data linkage	x	x	x	
	income (non)response	x	x	x	x
	Respondent consent to dried blood spots		x		
Personal details	Gender	x	x	x	x
	Year of birth	x	x	x	x
	Social networks	x	x	x	
	Use of online-banking	x	x		
	Social activities	x	x	x	
	Political position	x	x	x	
	Subjective health	x	x	x	x
	Citizenship	x			
	Parents' place of birth	x			
	Occupational status	x	x	x	x
	Level of education	x	x	x	x
	Household size	x	x	x	
	Household income	x	x	x	x
	Area of living			x	x

CHAPTER 10

Cognition and Ageing – Introducing SHARE-HCAP
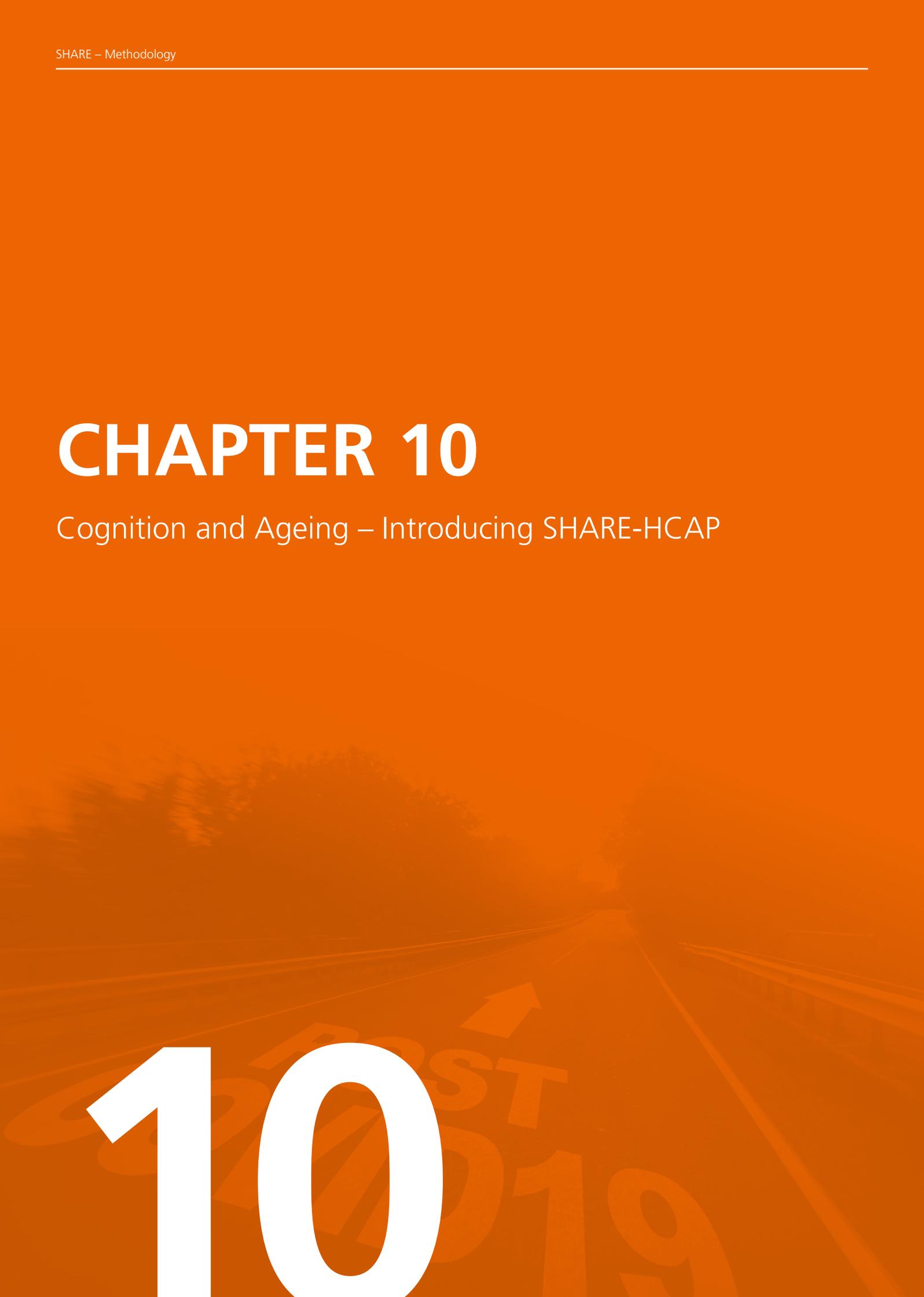
10

10 COGNITION AND AGEING – INTRODUCING SHARE-HCAP

Salima Douhou, Marcela Otero, Yuri Pettinicchi, Michael Bergmann, Giuseppe de Luca, Magdalena Quezada, Anna Rieckmann and Axel Börsch-Supan[26]

SHARE HCAP

Think-Recognise-Remember: the Health Study

Bio-medical and socio-economic precursors of cognitive decline in SHARE

10.1 Aim

The expected increase in the prevalence of dementia in ageing populations is a major concern both from a health and an economic point of view. Dementia is currently without actual cure, but the progression of symptoms may be delayed if modifiable risk factors and protective factors for mild and severe cognitive impairment are identified at an early stage.

The general aim of the SHARE-HCAP study in SHARE is to exploit the international variation of health and life circumstances across Europe to identify which interactions of bio-medical and socio-economic conditions over the life-course affect cognition in later life. The understanding of life-course pathways from healthy cognition to mild cognitive impairment and then, possibly, to dementia, can help the development of early preventive interventions. A more refined measure of cognition is needed to aid the identification of mild and severe cognitive impairment in the ageing population.

10.2 Study design

The study administers in-depth measurement of cognition according to the Harmonized Cognitive Assessment Protocol (HCAP), which was developed for Health and Retirement Study (HRS)-style ageing surveys. Specifically, the HCAP consists of a) a respondent survey comprised mainly of cognitive tests assessing a variety of cognitive domains and b) an interview with someone close to the respondent (informant interview or "family and friend"). Both the respondent and informant interview can be administered in the home or care facility environment by survey interviewers with advanced training.

The measures included in the HCAP study were selected to meet the following three criteria: (a) administration of the measures at home by a survey interviewer (b) comparative administration and assessment of measures across the HRS International Family of Studies, and (c) overlap with the HRS-ADAMS study (Weir et al. 2014; Plassman et al. 2007; Langa et al. 2005).

The study has been implemented in five SHARE countries (Czech Republic, Denmark, Germany, France, Italy) in a stratified study sample of SHARE panel respondents aged 65 years and older, who participated in at least one of the last three regular waves of SHARE (Waves 6, 7, or 8) and were eligible for SHARE Wave 9. Potential sample members were then assigned into one of three groups, using country-specific quantiles based on immediate and delayed word recall trials and self-reported doctor diagnosis of Alzheimer's disease or dementia in the last three regular SHARE interviews: (1) – low cognition and/or self-reported doctor diagnosis of Alzheimer's disease or dementia; (2) – moderate cognition and had never reported a doctor diagnosis of Alzheimer's disease or dementia; (3) – normal cognition or unknown for those with missing data on relevant variables. Instanc-

es where two or more SHARE panel respondents from one household were eligible, only one respondent was selected for the study based on her/his cognition status (i.e. when both partners had the same cognition status, one respondent was selected randomly, while when partners differed, the respondent with the worse cognitive condition was selected).

10.3   Adaptation

One of the challenges of this cross-national study is to adapt the HCAP such that a) it is relevant for the European and national context, b) the study content is harmonised across the countries participating in HCAP and c) the harmonisation of the content with other HCAP studies is given, in particular with HRS-HCAP (Langa et al., 2020) and with the English Longitudinal Study of Ageing (ELSA)-HCAP (Cadar et al., 2021). In addition to the country teams, renowned scientists from Europe (e.g. in geriatrics, neuropsychology, epidemiology, economics) and advisors from HRS and ELSA have been involved in this process.

With a new study, there is also the need to develop training for country teams, survey agencies and interviewers to administer content that only partially overlaps with SHARE. SHARE's Train-the-Trainers (TTT) method (see Sand et al., 2019 for details) was used for SHARE-HCAP. In addition to general interviewer training, extensive training on the administration of cognitive assessments, which is a non-standard task for survey interviewers, and administration of a questionnaire with a family member or friend regarding the circumstances of the SHARE-HCAP respondent (informant interview) is needed.

10.4   Fieldwork

The design of the study requires face-to-face interaction between interviewer and respondent, which was heavily restricted by the COVID-19 pandemic in many European countries in 2020 and 2021. After two pre-tests between July 2021 and February 2022, the main fieldwork began in May 2022 and lasted until Autumn 2022. This means that there was an overlap in the fieldwork period of SHARE Wave 9 and SHARE-HCAP. Care was taken to minimise respondent burden by leaving some time lag between the regular SHARE interview and the SHARE-HCAP. To support the stratified subsample design, eligible respondents were allocated to several, more or less equal-sized subsamples ('batches'): one with all respondents from the low cognition group, one with all respondents from the moderate cognition group and

the remaining respondents from the normal cognition group randomly assigned to other batches. Among the groups with low and medium cognition, it was expected that contact and willingness to participate would be more difficult. Therefore, these batches were prioritised at the start of fieldwork to allow enough time and effort to approach the target respondent. At the end of fieldwork, the target of 500 SHARE-HCAP interviews per country was achieved, which brings the total number of respondent interviews to over 2,500 for this study.

During the fieldwork, data collection was continuously monitored within and across the countries. Some aspects of the general monitoring procedure for SHARE had to be adapted to the specific circumstances of SHARE-HCAP: 1) progress of both the SHARE-HCAP respondent interviews and the family/friend interviews was monitored; 2) due to the overlap between the SHARE-HCAP and SHARE Wave 9 fieldwork periods, progress of individual countries in both studies was monitored simultaneously; 3) survey outcome indicators were calculated at the group level (see above) to monitor progress by cognition group and country.

10.5   Weighting strategy

The fact that the SHARE-HCAP sampling frame was constructed from the pool of respondents who participated at least once in the last three regular waves of SHARE has both advantages and disadvantages: On the one hand, it implies that the underlying gross sample may suffer from selection effects due to unit nonresponse and attrition in the previous waves of the SHARE panel. On the other hand, the underlying design weights can be computed for all units of the gross sample and one can exploit a considerably larger set of auxiliary variables when accounting for the unit nonresponse errors that occurred in the study.[27] These two features of the study led us to consider alternative weighting methods that are more robust than the usually applied (one-step) calibration procedure (see, e.g., Brick, 2013; Molenberghs et al., 2015; Vermeulen & Vansteelandt, 2015; Haziza & Lesage, 2016; De Luca, 2016).

In particular, the calibrated cross-sectional weights for SHARE-HCAP were computed using a two-stage procedure that involves the estimation of a propensity-score model for the response process in the first stage and a calibration adjustment in the second stage. To model the response process, we used a logit regression for a binary indicator that takes value one for the sample units that agreed to participate in the SHARE-HCAP study and value zero otherwise. Estima-

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27   The SHARE-HCAP design weights were calculated by adjusting the selection probabilities from SHARE Waves 6, 7, and 8 for the selection probabilities implied by the stratified sampling design used in the SHARE-HCAP study.

tion was performed by standard maximum likelihood methods, separately by country and controlling for the SHARE-HCAP design weights. Our set of predictors included a second-order polynomial of age and a set of indicators for gender, NUTS1 (only in France, Germany, and Italy), participation patterns in the previous regular waves of SHARE, and the SHARE-HCAP stratification variables (cognitive status as described above and restriction to one respondent per household).[28] Based on this model, we firstly constructed a set of propensity-score weights by applying the ratio between the SHARE-HCAP design weights and the estimated response probability. In the second stage of the procedure, we constructed a set of calibrated weights that were as close as possible (according to a distance function) to the propensity score weights obtained in the first stage and that satisfied a set of population calibration margins. As for the calibrated weights of the other SHARE studies (see chapter 8), we used a logit specification of the distance function, a first set of population margins for the gender-age groups, and a second set of population margins for the 2016 NUTS1 regional indicators. In the case of the SHARE-HCAP study, the definition of the gender-age groups is based on a finer partition: namely, males and females in the age classes [65 – 69],[70 – 74], [75 – 79], [80+). The underlying population margins are reported in Table 10.1.

Table 10.1: Gender-age Population Margins for the Calibrated Cross-sectional Weights of SHARE-HCAP

Country	Men				Women				Total
	[70-74]	[75-79]	[80+]	[65-69]	[70-74]	[75-79]	[80+]		
CZ	276,060	186,274	162,290	353,927	346,347	266,408	307,274		2,210,380
DE	1,951,371	1,438,108	2,382,502	2,600,318	2,235,156	1,770,709	3,762,706		18,517,042
DK	147,210	128,948	118,225	164,985	159,626	145,640	173,400		1,195,826
FR	1,715,767	1,130,615	1,507,613	2,070,365	1,995,194	1,397,913	2,633,638		14,278,739
IT	1,589,730	1,208,782	1,758,077	1,876,347	1,812,156	1,475,837	2,859,232		14,277,858

The SHARE-HCAP study aims to provide comparable assessments of cognitive impairment across the globe; many other population-based studies of older adults all over the world have integrated (or will do so soon) HCAP as part of their core study. SHARE-HCAP is included in this initiative and will offer the research community a rich, ex-ante harmonised set of cognitive measures to promote further research in this area.

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28 In principle, we could easily use a much larger set of predictors by exploiting the data collected in the regular SHARE Waves 6, 7, and 8 and the SHARE-HCAP fieldwork (e.g., other socio-demographic variables, further measures of physical and mental health, or the number and timing of contact attempts). In practice, however, less parsimonious models may lead to a larger variability of the predicted probabilities and the associated propensity score weights (see, e.g., De Luca 2016, Zigler and Dominici 2014, and Cefalu et al. 2017). Shrinkage methods may help to address this bias-precision trade-off, but this further development is left to future research.

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