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Citation: Villar, A., Sommer, E., Finnoy, D., Gaia, A., Berzelak, N. & Bottoni, G. (2018). CROss-National Online Survey (CRONOS) panel data and documentation user guide. London, UK: ESS ERIC.

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CROss-National Online Survey (CRONOS) panel: Data and documentation user guide

This project has received funding from the *European Union's Horizon 2020 research and innovation programme* under grant agreement No 654221.





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SERISS (Synergies for Europe's Research Infrastructures in the Social Sciences) aims to exploit synergies, foster collaboration and develop shared standards between Europe's social science infrastructures in order to better equip these infrastructures to play a major role in addressing Europe's grand societal challenges and ensure that European policymaking is built on a solid base of the highest-quality socio-economic evidence.

The four-year project (2015-19) is a collaboration between the three leading European Research Infrastructures in the social sciences – the European Social Survey (ESS ERIC), the Survey for Health Aging and Retirement in Europe (SHARE ERIC) and the Consortium of European Social Science Data Archives (CESSDA AS) – and organisations representing the Generations and Gender Programme (GGP), European Values Study (EVS) and the WageIndicator Survey.

Work focuses on three key areas: Addressing key challenges for cross-national data collection, breaking down barriers between social science infrastructures and embracing the future of the social sciences.

Please cite this user guide as: Villar, Ana, Sommer, Elena, Finnøy, Didrik, Gaia, Alessandra, Berzelak, Nejc, and Bottoni, Gianmaria. (2018) CROss-National Online Survey (CRONOS) panel data and documentation user guide. London: ESS ERIC.

Introduction

This user guide provides a short overview of the data and documentation of the CROss-National Online Survey (CRONOS) panel made publicly available via the ESS website. The guide provides succinct information about the design and implementation of the project and highlights the key features of the available data files.

The document has four main sections. Section 1 introduces the goals and scope of the panel; section 2 describes the panel methodology; section 3 provides an overview of the questionnaire contents, and section 4 gives an overview of the data files, help on how to access and combine datasets and a description of survey weights.

Further information on the rationale, design, and implementation of CRONOS is publicly available on the CRONOS page of the ESS website (www.europeansocialsurvey.org/cronos) alongside the data and on the SERISS website (www.seriss.eu/resources/deliverables). Relevant sources of information will be referenced throughout this user guide.

Queries from data users should be addressed to the ESS HQ team, writing to the following address: ess@city.ac.uk.

1. CROss-National Online Survey (CRONOS) panel: Overview

The CRONOS panel has been the first attempt to set up a cross-national probability-based web panel under an input-harmonisation framework, where panel recruitment, setup and maintenance were guided by the same methodological principles in all participating countries. To make this effort efficient, the panel was built on the back of an established probability-based cross-national face-to-face survey: the European Social Survey (ESS).

CRONOS was a pilot study to evaluate the effectiveness of panel recruitment on the back of an existing cross-national survey in terms of costs, sample representativeness, participation and attrition rates, and data quality. It served as a proof of concept for the possible future development of a larger European level, methodologically harmonised, probability-based, web panel.

We hope CRONOS will serve as a valuable source of both substantive survey data and methodological insights for those interested in web surveys.

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2. Methodology

Methodological harmonisation and piggy-backing

CRONOS was conceived with a harmonised methodology approach, keeping survey features constant across countries where feasible and appropriate. The goal was to avoid having methodological differences across countries that potentially affect measures and thus create confounds when interpreting country differences in the variables of interest.

Setting up such a harmonised infrastructure just to recruit respondents to complete online surveys would have been costly and challenging, so the decision was taken to use an existing survey infrastructure that followed the same harmonisation principle (piggy-backing). The ESS not only supported this initiative by allowing CRONOS researchers to use the ESS sample and interviewer workforce to recruit panel members, but it was at the core of its proposal, design and implementation.

As a pilot project, CRONOS was set up in only three ESS countries: Great Britain, Slovenia, and Estonia. The goal was to pilot a harmonised design that could later be scalable to a larger project with numerous countries in a cost-effective context. To uncover as many challenges and limitations as possible, the three countries were chosen to represent different cultures and realities within Europe.

Target population

The CRONOS panel target population was adults (18+) living in private households in Estonia, Slovenia and Great Britain¹. We excluded those aged 15 to 17 to avoid the risks associated with providing minors with monetary incentives and internet-enabled devices. There was no upper age limit for participation in CRONOS.

Sampling Frame

CRONOS participants were recruited after participating in Round 8 (2016/17) of the ESS (www.europeansocialsurvey.org). This choice allowed recruiting panel members from random probability samples of the general population.

With the exception of 15-17 years old and Northern Ireland, the CRONOS gross sample is the same as the gross sample for the main ESS face-to-face survey in Round 8. Information on the ESS sampling frame and sample design for each country is available in the ESS data documentation report (ESS, 2017). In short, Estonia and Slovenia used population registers, and selected units according to different strata. The Slovenian sampling frame includes individuals who have requested to never be contacted for research purposes. Although eligible for our studies, 'opt-out' individuals randomly selected were never contacted and were thus considered nonrespondents.

¹ For reasons related to fieldwork logistics, Northern Ireland was excluded from the CRONOS target population (see Villar and Sommer, 2017).

Great Britain used an address-based sampling frame, a multi stage sampling design with systematic sampling at the first two stages and Kish's procedure implemented by the interviewer at the last stage for random respondent selection.

Standardised recruitment procedures

The ESS interview served as recruitment interview for the CRONOS panel, providing a wide range of background variables for panel members. As in many other survey panels, completing the recruitment interview was a requirement to become a panel member.

Recruitment procedures were standardised across CRONOS countries. 'Source' fieldwork documents (Villar and Sommer, 2016), such as interviewer manuals, instructions and protocols, were prepared centrally with frequent input from the national teams, to ensure that the proposed practices would be feasible in all countries participating in CRONOS, and thus increase the likelihood that these would also work if implemented in a European-wide online survey panel.

The source fieldwork documents were then distributed to the national teams for translation. Local versions of the documents were kept as close as possible to the source version and any necessary deviations were agreed with the central team and documented centrally.

Respondents were asked for contact information (email address and telephone number) to send invitations and reminders to web surveys. When respondents did not provide an email but did not refuse to join the panel, they were invited by post for the first few waves, with the aim to recruit as many panel members as possible; during the interview, they were asked again to provide a contact email so they could continue participating in the panel.

Including the offline population

To enable their participation in the panel and attempt to reduce nonresponse bias related to technological barriers, respondents without internet access for private use were offered a tablet with high-speed internet connection for 12 months. These panel members can be identified in the datasets using the variable 'tablet'.

Staff showed panel members how to use the tablet, how to find and open survey invitations, and how to access and complete the survey. Furthermore, panellists received a leaflet with instructions on how to use the tablet and with the helpline contact details. Tablet delivery took place between February 2017 and April 2017.

In Great Britain and Slovenia, email accounts were set up for all 'tablet respondents' to enable sending the survey link via email invitations. In Estonia, 'tablet respondents' received postal invitations to web surveys containing a shortened URL and instructions on how to use the link on their devices to access the survey.

Incentives

All eligible respondents were offered unconditional incentives for a value of £5/€5 per sent wave. The Estonian team sent €10 online vouchers (except tablet members, who received postal vouchers) every other wave from Tallinna Kaubamaja Grupp. The Slovenian team sent a €10 voucher every other wave from a national supermarket chain. In Great Britain, £5 Amazon online vouchers were used for the welcome survey; subsequently, 'Love-to-shop' vouchers² were sent with postal pre-notifications to panel members. In Great Britain, an experiment was conducted to compare the effect of wave-to-wave (£5) vs. one-off unconditional (£30) incentives. Details of this experiment are available in Villar, Sommer, Berzelak and Bottoni (2018).

Panellists communications: pre-notifications, invitations, reminders and helpline

Design. As with other study protocols, source versions of invitations and reminders were prepared by the central team in collaboration with all local teams; these were then programmed and distributed from the central survey software and sent out (as far as possible) on the same day and at the same local time. The content of these communications can be found in ESS ERIC (2018). Local teams provided translations, handled telephone calls and emails to the panel helpline, and prepared and distributed any postal communications.

Schedule. Panellists received an email invitation to each wave with an individual survey link and three email reminders; the first reminder was sent 4-5 days after the fieldwork started, the second about two weeks after, and the third about a week before fieldwork closure. The correspondence dataset shows the date and format in which each communication was sent to each respondent for waves 2 to 6. Data for waves 0 and 1 was lost due to a technical problem.

Panellists in Great Britain and Slovenia also received postal pre-notifications of the forthcoming survey invitation. In addition, panellists without internet access for personal use were sent postal pre-notifications in Slovenia and Great Britain and postal invitations with the survey link in Estonia. A postal reminder was sent a few weeks later.

In waves 5 and 6, contact modes were varied experimentally: in wave 5, the mode of the reminder was manipulated; in wave 6, the mode of both the pre-notification and the reminders were manipulated. More information on these experiments is available in Villar, Sommer, Berzelak and Bottoni (2018).

For more information on the web recruitment design plans please see Villar and Sommer (2017).

² The decision to move from Amazon vouchers to high street vouchers was motivated by the higher attractiveness of high street vouchers for respondents. Several respondents informed the CRONOS helpline of their unwillingness (for ethical reasons) and/or of their difficulty to use Amazon vouchers (for lack of an account).

Fieldwork

Data collection started in December 2016 with a 10-minute welcome survey (also referred to as wave 0). Every two months, from February 2017 to February 2018, panellists were invited to complete 20-minute surveys³, for a total of six survey waves (in addition to the welcome survey).

Table 1 shows an overview of the fieldwork start and end date for each wave. Wave 0 and wave 1 remained open for a longer time to maximise recruitment of panel members (as ESS fieldwork was still ongoing until March 2017) and to allow tablet respondents to participate in these two waves, as tablets were delivered a few months later after the first batch of welcome survey was sent out.

Table 1: Fieldwork start and end dates

	Start date	End date
Welcome survey (wave 0)	12/2016	04/2017
Wave 1	02/2017	06/2017
Wave 2	04/2017	06/2017
Wave 3	06/2017	08/2017
Wave 4	09/2017	10/2017
Wave 5	11/2017	12/2017
Wave 6	01/2018	02/2018

Invitations to wave 2 for the tablet sample in Slovenia were mistakenly sent before invitations to wave 1. Thus, fieldwork for wave 1 remained open for a longer time to enable participation for those for whom the wave 1 invitation was delayed.

Survey administration

The survey was programmed centrally and administered using the survey software Questback – see Sommer, Villar, Finnøy, Johannesen, Aarsand (2017) and Finnøy, Johannesen, Aarsand, Villar, Sommer (2017).

To take part in the survey, participants only needed to click on the link provided in the invitation email. Respondents were free to complete the survey on whatever internet enabled device (computer, tablet, smartphone) they wished. Respondents could exit the survey and finish completing it at a subsequent time. To protect their privacy, respondents re-accessing the survey did not have access to answers provided in the previous session. The paradata files provide information about the number of times respondents stopped and resumed completion of a given wave as well as the device they used at each session.

³The duration was reduced to 15 minutes for wave 4 to compensate for previous surveys being longer than anticipated.

In addition to answers provided by respondents, data about the response process (paradata) were collected during questionnaire completion. Basic paradata were collected as a standard feature of the web survey tool for all waves. This includes respondent-level information about the survey outcome (disposition status), last page displayed to the respondent (helping identify break-off location), participation start and end timestamps and the total time the respondent spent in the questionnaire. From wave 2 onwards, a more accurate and detailed paradata collection approach developed by CentERdata was implemented, including response times at individual questionnaire pages, device switching, temporary breaks and resumptions of survey participation (sessions), as well as skip attempts and back clicks on individual pages.

Participation rates

Tables 2 and 3 show the response rates and participation rates for all three countries and all waves.

Table 2: CRONOS response rates (%), number of interviews (partial+complete) as a proportion of the gross sample.

Wave	Estonia		Great Britain		Slovenia	
	%	n	%	n	%	n
0	23	669	12	539	29	642
1	25	730	15	685	23	529
2	23	664	16	692	21	482
3	22	624	15	679	26	586
4	20	581	14	610	25	561
5	21	600	14	633	27	615
6	21	600	14	641	25	571
Gross sample		2901		4447		2278

Note: Response rate is calculated as the sum of complete and partial interviews over total number of issued sample units eligible for CRONOS – excluding those identified as ineligible by interviewers (e.g., ineligible addresses in Great Britain, sample units no longer living in the country), and those who did not meet the CRONOS eligibility criteria (sample members aged 15-17 and/or living in Northern Ireland).

Table 3: CRONOS participation rates (%): number of participants (partial+complete) as a proportion of sample units invited to participate in CRONOS

	Estonia		Great Britain		Slovenia	
Wave	%	Invited	%	Invited	%	Invited
0	72	933	44	1215	82	779
1	78	938	56	1218	67	790
2	82	807	60	1152	63	770
3	79	786	59	1147	81	725
4	74	784	53	1144	78	722
5	77	782	55	1141	85	720
6	77	782	56	1136	80	718

Data processing

Data processing was carried out in order to produce user friendly codebooks and data files. This involved data cleaning (of labels and values), implementing custom missing values and making data available in multiple formats.

Due to ethical considerations, panel members were allowed to ‘skip’ any question if they wished to do so, even if they had not provided any answers or the answer did not match the intended format. If respondents entered words in open-ended questions requesting numeric responses, those responses were post-coded with a custom missing value.

Data were checked for disclosure risks by the national teams; where identification risks arose, NSD replaced the verbatim answers with post-coded values provided by the National Coordinator’s teams. A few variables in wave 6 of the survey were judged to present a significant disclosure risk and require an unfeasible degree of post-coding to mitigate this risk. These variables have been assigned missing values.

3. CRONOS questionnaires

CRONOS waves were designed and programmed in ‘source English’ and then localised for each language: British English, Slovenian, Estonian and Russian. Respondents received the language version that matched the language in which the ESS face-to-face interview was conducted⁴. Translations were carried out by the national teams; when source questions had been borrowed from existing projects, available translations were reviewed by the teams and adopted if considered suitable.

⁴ One Estonian respondent asked to be switched to their strongest language for CRONOS participation.

CRONOS is both a panel for cross-national data collection on substantive topics and a platform for experimental testing on questionnaire design. Thus, CRONOS was used for questionnaire pretesting for some of the surveys participating in the SERISS project; specifically, the European Social Survey (ESS) Round 9, European Values Study (EVS) 2017, and Generations and Gender Programme (GGP).

The topics covered by the CRONOS surveys included:

- societal wellbeing, personality traits, need to evaluate and need for cognition;
- values, beliefs, religion, attitudes (to science and technology, to marriage, and towards migrants), trust and social capital, participation elections and in politics, and national pride;
- work, income, wellbeing, living conditions, education, and welfare;
- internet use and literacy, use and attitudes towards social media;
- family structure, intergenerational support, parenting, and gender roles;
- and the environment.

Furthermore, the survey fielded questions on survey participation, survey experience, and question probes to evaluate the pretested questions. Finally, ‘benchmarkable questions’ were included to evaluate data quality, triangulating the CRONOS summary statistics with other data sources such as public records and high-quality surveys.

Additional information on the questionnaires is available to CRONOS data users:

- Details about questionnaire topics, the source of questions taken from other surveys, details of implemented experiments and programming guidelines used for the CRONOS surveys can be found in Villar, Sommer, and Finnøy (2018).
- Details about question wording experiments, as well as test methods to enhance panellists’ responding behaviours via motivational messages can be found in Villar, Sommer, Berzelak and Bottoni (2018).
- The actual wording of the questions with the response options (source questionnaire) is available in the source codebooks, which can be retrieved [here](#). Survey screenshots and translated questionnaires are also available on the CRONOS page on the ESS website (www.europeansocialsurvey.org/cronos).

4. CRONOS datasets

Overview of available datasets

Thirteen different datasets are published and made freely available for download from www.europeansocialsurvey.org/data/download_cronos.html. Table 4 provides details of dataset names and descriptions.

Codebooks are available for each dataset and can be retrieved [here](#).

Some datasets contain open-ended answers. These answers have been checked by national teams to ensure they do not pose risk of identification. SPSS and SAS files may have truncated values under string variables; .csv files which provide the checked text strings in full are available on request to data users wishing to analyse such data.

Table 4: Summary of datasets released

Dataset Name	Dataset Description
[integrated data]	One dataset containing substantive web survey data from all waves plus ESS8 data for responding panellists in all three countries (Slovenia, Great Britain and Estonia).
[wave0] [wave1] [wave2] [wave3] [wave4] [wave5] [wave6]	One dataset for each wave of data collection, containing web survey data for responding panellists in all the three countries (Slovenia, Great Britain and Estonia). These files do not contain ESS8 data. Data users wishing to use variables from ESS Round 8 may use the integrated file, or may merge these files with the ESS round 8 files.
[correspondence data]	One dataset containing data on the communication with sample members recruited to the panel (e.g., dates when reminders and invitations were sent), in all three countries (Slovenia, Great Britain and Estonia). For technical reasons, these data are only available for waves 2-6.
[administrative data]	A dataset containing information on the initial response to the recruitment interview (yes vs. unsure); information on whether the panellist was given a CRONOS tablet; information on whether the respondent provided a valid email address; and a variable to identify respondent allocation for the GB incentive experiment. Data are available for CRONOS-eligible ESS8 respondents.
[basic paradata]	A dataset containing basic information about the response process of respondents to waves 0-6 in all three countries (Slovenia, Great Britain and Estonia). For each wave, this includes information about the final participation status, survey questions on which participation ended, time of start and end of participation, and total time spent in the survey. Additional information about the device types used by respondents is provided for waves 2-6 in which additional scripts were used to collect paradata.
[cleaned raw paradata file]	A dataset containing raw detailed paradata as collected by dedicated paradata collection scripts in waves 2-6 in all three countries (Slovenia, Great Britain and Estonia). This file has been minimally processed and contains one line per

	recorded event. It was used to derive the detailed paradata files and some variables in the basic paradata file.
[detailed paradata]	<p>A dataset containing more detailed and extended information about the response process for waves 2-6 in all three countries (Slovenia, Great Britain and Estonia). It was derived from the raw paradata file.</p> <p>In addition to information available in the basic paradata, this dataset provides further details about devices and software used to participate in the survey as well as time spent, skip attempts and back clicks on individual questionnaire pages. Information is provided separately for each survey 'session'; a new sessions was logged when there were temporary participation breaks, device switching or inactivity.</p>

Correspondence data for waves 0 and 1 are not available due to a limitation of the survey software. Some paradata are available only for waves 2 to 6, because the supplementary paradata collection tools provided by CentERdata were implemented only from wave 2 onwards.

Data access

Datasets are freely available to download from ESS website for non-commercial use from www.europeansocialsurvey.org/data/download_cronos.html, in three different formats: SPSS, STATA, and SAS.

ESS Round 8 data (which can be combined with CRONOS datasets) are also freely available for download for non-commercial use, along with ESS Round 8 documentation, from www.europeansocialsurvey.org/data/download.html?r=8.

CRONOS data should be cited as: CROss-National Online Survey panel [NAME OF DATASET] (2018). NSD - Norwegian Centre for Research Data, Norway – Data Archive and distributor of CRONOS data for ESS ERIC.

Combining datasets

It is possible to combine any of the different CRONOS datasets for analysis. CRONOS datasets can also be combined with the ESS Round 8 datasets.

To combine CRONOS and/or ESS datasets the datasets should be merged using two variables: "IDNO" (a unique identifier for ESS respondents in each country) and "Country".

Weights

An analysis weight has been produced for each of the seven waves of CRONOS. These weights are named W0WEIGHT, W1WEIGHT, W6WEIGHT, where the second character of the variable name indicates the wave to which it relates. The relevant weight is included on each of the wave-specific data files and all seven weights are included in the integrated file.

Each of these weights was created by adjusting the post-stratified ESS8 design weight (PSPWGHT) for non-response at the respective wave of CRONOS. The weights can therefore be used on their own for any analysis of CRONOS data, as they incorporate the ESS8 design weight and adjustments for nonresponse at both ESS8 and the respective CRONOS wave.

The CRONOS nonresponse adjustment derived from a logistic regression model of response at the respective CRONOS wave conditional on response at ESS8, the adjustment factor being the reciprocal of the model predicted value (probability of responding to the respective CRONOS wave). The predictor variables in the model were selected via a two-step process. In the first step, a backward stepwise procedure was used to develop a model for each of three response outcomes (wave 0, wave 3, wave 6) for each country (so, nine models). In each model, only significant predictors ($P < 0.05$) were retained and adjacent categories of ordinal predictor variable were combined if coefficients were not significantly different. The models were very similar in the variables retained, especially within countries. In the second step a single model was developed, containing as predictors all variables that were retained in at least one of the nine wave/country-specific models and retaining all distinctions between categories that were retained in at least one model. This procedure resulted in a model with nine categorical predictor variables. For consistency, this same model was then fitted to each of the seven outcomes for each country and used to derive the weight adjustments. These therefore derived from 21 separate models. The predictor variables were based upon the ESS8 variables VOTE, BRNCNTR, GNDR, AGEA, MARITALB, DOMICIL, EISCED, PDWRK, REGION though in most cases with some categories combined (AGEA was reduced to a 7-category variable prior to model fitting and was further reduced to 5 categories during the fitting process: 15-24, 25-34, 35-54, 55-74, 75+). For each country-wave combination, the adjusted weight was scaled to a mean of 1.0 and any weights larger than 4.0 were trimmed to 4.0 (there were few such weights). After trimming, the weights were again rescaled to a mean of 1.0.

Acknowledgements

The CRONOS panel has been developed under Work Package 7 (WP7) 'A survey future online' of the project 'Synergies for Europe's Research Infrastructures in the Social Sciences (SERISS)' and received funding from the *European Union's Horizon 2020 research and innovation programme* under grant agreement No 654221. The CRONOS initiative was also supported by ESS ERIC Work Programmes (2015-2017) and (2017-2019).

The design and implementation of the CRONOS panel was centrally led and coordinated by researchers at ESS ERIC HQ (Ana Villar and Elena Sommer), the Norwegian Centre for Research Data, NSD (Didrik Finnøy, Bjørn-Ole Johannesen, and Linn-Merethe Rød), the University of Ljubljana (Nejc Berzelak), and CentERdata (Arnaud Wijnant). The central team worked closely with the three national teams.

The CRONOS national team in Estonia comprised Mare Ainsaar and Indrek Soidla (University of Tartu); in Slovenia Slavko Kurdija, Tina Vovk, May Doušak, Živa Broder

and Rebeka Falle (University of Ljubljana); and in Great Britain Alun Humphrey, Emma Fenn, Matt Jonas, and Johanne Maher (NatCen Social Research).

Supporting the central and national teams were:

- The CRONOS advisory board: Vasja Vehovar (University of Ljubljana), Salima Douhou (City, University of London), Anne Cornilleau (Sciences Po), Mario Callegaro (Google), and Michael Bosnjak (Leibniz Institute for Psychology and University of Trier).
- Researchers at several SERISS-partner institutions:
 - o Gianmaria Bottoni, Alessandra Gaia, Sarah Butt, and Rory Fitzgerald at ESS ERIC HQ;
 - o Erlend Aarsand, Kirstine Kolsrud and Knut Skjåk at NSD;
 - o Wiebke Weber and Melanie Revilla at Universitat Pompeu Fabra;
 - o Eric Balster at CentERdata;
 - o and Annette Scherpenzeel and Julie Korbmacher at the Munich Center for the Economics of Aging.

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