Norwegian Citizen Panel

2019, Sixteenth Wave

Methodology report

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NORSK MEDBORGERPANEL

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TABLE OF CONTENTS

BACKGROUND

This report describes the procedures of data collection in the sixteenth wave of The Norwegian Citizen Panel. Furthermore, the report discusses technical aspects of the data collection before turning to the representativity of the panel and how the weights are calculated.

The Norwegian Citizen Panel (NCP) is one of the main components of Digital Social Science Core Facility (DIGSSCORE) at the University of Bergen. NCP was established as a collaboration between several departments at the Faculty of Social Sciences at the University of Bergen and NORCE.

ideas2evidence is responsible for the panel recruitment, the administration of the panel, and the technical solutions regarding data collection and computing.

TECHNICAL ASPECTS OF THE SURVEY

SOFTWARE

The surveys are administrated through the web-based survey software Confirmit. Confirmit is a "Software-as-a-Service" solution, where all software runs on Confirmit's continuously monitored server park, and where survey respondents and developers interact with the system through various web-based interfaces. This software provides very high data security and operational stability. The security measures are the most stringent in the industry, and Confirmit guarantees 99.7 percent uptime. ideas2evidence does the programming of the survey in Confirmit on behalf of The Norwegian Citizen Panel.

PILOT – PROCEDURE AND ASSESSMENT

The survey went through small-N and large-N pilot testing before data collection. In addition, the survey was tested extensively during the development phase by ideas2evidence and the researchers involved in the project.

The pilot testing was regarded as successful, and no major technical revisions were deemed necessary.

The field period started by inviting a random sample of the respondents (soft launch). This was done in order to minimize the consequences if the questionnaire contained technical errors. No such errors were located/reported after two hours of data collection among the random sample. Remaining panel members was therefore invited.

During the data collection seven respondents reported having problems with the URL directing to the questionnaire due to TLS security settings. These issues were explained by the use of old browsers[1] that does not support TLS version 1.2.

These problems however effected a low number of panel respondents (ten in all), the field period is thus regarded as successful.

[1] https://qsportal.atlassian.net/wiki/spaces/DOC/pages/3571715/TLSv1.2+Browser+Compatibility

RANDOMIZATION PROCEDURES

Each wave of NCP has an extensive use of randomization procedures. The context of each randomization procedure may vary, [2] but they all share some common ground that will be described in the following.

All randomization procedures are executed live in the questionnaire. This means that the randomization takes place while the respondent is in the questionnaire, as opposed to pre-defined randomizations that are uploaded to the questionnaire. All randomizations are independent from another, unless the documentation states otherwise.

The randomization procedures are written in JavaScript. Math.random()[3] is a key function, in combination with Math.floor()[4]. These functions are used to achieve the following:

- Randomly select one value from a vector
- Randomly shuffle the contents of an array

The first procedure is typically used to determine a random sample of respondents to i.e. a control group. Say for example we wish to create two groups of respondents: group 1 and group 2. All respondents are randomly assigned the value 1 or 2, where each randomization is independent from one another. When N is large enough these two groups will be of equal size (50/50).

Here is an example of the JavaScript code executed in Confirmit:

```
var form = f("x1");
if(!form.toBoolean()) // If no previous randomization on x1
{
  var precodes = x1.domainValues();// Copies the length of x1
  var randomNumber : float = Math.random()*precodes.length;
  var randomIndex : int = Math.floor(randomNumber);
  var code = precodes[randomIndex];
  form.set(code);
}
```

The second procedure is typically used when defining the order of an answer list as random. This can be useful for example when asking for the respondent's party preference or in a list experiment. However, since i.e. a party cannot be listed twice, the procedure must take into account that the array of parties is reduced by 1 for each randomization.

Here is an example of the JavaScript code executed in Confirmit [5]:

[2] Some examples: sorting respondents in different thematic subsets, randomly allocate treatment value in experiments, randomize order of an answer list/array, order a sequence of questions by random, ask a given question to a subset of the respondents.
[3] Please see following resource (or other internet resources):https://developer.mozilla.org/en-US/docs/Web/JavaScript/Reference/Global_Objects/Math/random
[4] Please see following resource (or other internet resources):https://developer.mozilla.org/en-US/docs/Web/JavaScript/Reference/Global_Objects/Math/floor
[5] Code collected from Mike Bostocks visualization: https://bost.ocks.org/mike/shuffle/

```
Function shuffle(array) {
  var currentIndex = array.length, temporaryValue, randomIndex;
  // While there remain elements to shuffle...
  while (0 !== currentIndex) {
    // Pick a remaining element...
    randomIndex = Math.floor(Math.random() * currentIndex);
    currentIndex -= 1;

    // And swap it with the current element.
    temporaryValue = array[currentIndex];
    array[currentIndex] = array[randomIndex];
    array[randomIndex] = temporaryValue;
  }
  return array;
}
```

PREVIOUS WAVES OF RECRUITMENT

Existing panel members were recruited in wave 1, wave 3, wave 8, wave 11 and wave 14. All samples were drawn from the *National Population Registry* of Norway. This registry holds information on everyone born in Norway, as well as former and current inhabitants. The formal responsibility for this registry is held by the Norwegian Tax Administration but the administration is partly outsourced to the private IT-company Evry. Evry drew the sample on behalf of the Norwegian Citizen Panel after relevant permissions were acquired from the Norwegian Tax Administration.

The samples consisted of people over the age of 18 that were randomly drawn from the register. The extracted information was a) last name, b) first name, c) address, d) gender, e) year of birth, and f) phone number (the latter was not included in wave 1). The sample excluded persons without a current home address in Norway.

For a detailed description of the recruitment process in wave 1, wave 3, wave 8, wave 11 and wave 14, we refer to the respective methodology reports for each wave. Note, however, that there are some differences between the recruitment processes. Please refer to table 1. A detailed description of the recruitment in wave 16 follows in the next section.

Note that the response rate of recruitment 4-6 is substantially lower than other waves of recruitment. The most important explanation is new restrictions enforced by the Norwegian Tax Administration with regards to how many times the Citizen Panel can contact persons in the net sample. At the most, respondents in recruitment 4-6 was contacted twice. The exception is recruitment 1 which also had a maximum of two contact points, but achieved a response rate of 20 percent. One explanation for why we cannot replicate a response rate of 20 percent in recruitment 4-6 might be that NCP did a lot of promotion of the panel through different media outlets leading up to and during recruitment 1. The promotion of the panel was also done in relation to the Norwegian Parliamentary election that same fall.

Table 1: Summary of recruitment processes

	Sample size	Mode	Contacts	Returned letters	Response Rate (%)
Recruitment 1 (wave 1)	25 000	Postal	2	546	20.1 %
Recruitment 2 (wave 3)	25 000	Postal, phone/SMS	4	543	23.0 %
Recruitment 3 (wave 8)	22 000	Postal/SMS	3	479	19.4 %
Recruitment 4 (wave 11)	14 000	Postal/SMS	2	334	15.1 %
Recruitment 5 (wave 14)	14 000	Postal/SMS	2	389	15.0 %
Recruitment 6 (wave 16)	34 000	Postal/SMS	2	994	14.9 %

DATA COLLECTION WAVE 16

RECRUITING A NEW SET OF PANEL MEMBERS

In wave 16, the Norwegian Citizen Panel recruited new panel members. This section gives a detailed description of the sample frame, recruitment process and the results.

THE RECRUITMENT PROCESS

As in the preceding waves of recruitment a gross sample was drawn from the population registry. Evry drew the sample on behalf of the Citizen Panel after the necessary permissions were acquired from the Norwegian Tax Administration.

34,000 people over the age of 18 were randomly drawn from the register. The extracted information was as before a) last name, b) first name, c) address, d) gender, e) telephone number(s) (if available) and, f) year of birth. The sample excluded individuals without a current home address in Norway.

RESULTS OF THE RECRUITMENT PROCESS - SURVEY RESPONDENTS AND PANEL MEMBERS

First, letters were sent to everyone in the sample. The letters contained the following information: a) a description of the project, b) the Citizen Panel's policy on privacy and measures taken to protect the anonymity of the participants, c) the time-frame of the project, d) the participants' rights to opt of the panel at any time in the future, e) contact information for the people responsible for the project, f) a unique log-in id and the web address to the panel's web site and g) the estimated time required to complete the survey (15 minutes).

In order to maximize the response rate, an incentive in the form of a travel gift card is included in the project. The value of the gift card is 25 000 NOK. To enter the lottery respondents were required to join the panel and provide their email addresses. Respondents were asked to register on the panel's web site and log into the survey using the unique ID-code provided in their personal letter. Information on the lottery was included in all correspondence with respondents.

The invitational letter was posted 29th of October 2019.

The second reminder was distributed by SMS or post card. Respondents below 60 years of age registered with a cell phone number received a SMS. Respondents that did not fit this description received a post card reminder. This is different from the first three waves of recruitment. In wave 11 an experiment was conducted regarding the use of SMS and postcard. That experiment gave the panel more information regarding the effectiveness of different recruitment strategies, and thus gave the opportunity for a more cost-efficient use of reminders in wave 14 and wave 16.

Both reminders were sent to respondents who a) had not logged into the survey, or b) had neither completed the survey. Respondents were encouraged to join the panel, with reference to the invitation letter. The unique log-in ID provided in the original letter was included in both the post card and the SMS. The SMS reminder also included a direct link to the survey.

The post card was posted the 12th of November, and the SMS was distributed November 13th.

RESULTS OF THE RECRUITMENT PROCESS - SURVEY RESPONDENTS AND PANEL MEMBERS

It is necessary to make a distinction between panel members and survey respondents. We define panel members as respondents who register their e-mail address, regardless of whether they have completed the questionnaire or not. Survey respondents are respondents who has completed a certain share of the questionnaire, regardless of whether they have entered their e-mail address or not.

Of the 34,000 letters that were sent out, 994 were returned, and 9 respondents opted out. 18.2 percent (6,033) of the remaining 32,997 logged on and accessed the survey. 4,978 individuals completed the questionnaire, while 1,054 exited the questionnaire before completion, though 5.0 percent of these responses are kept as a part of the survey data. The remaining 1,031 incomplete responses are excluded from the survey, due to lack of data.

In sum, after subtracting a few cases where the credentials of the respondent did not match the credentials of the invited, the recruitment to the Norwegian Citizen Survey resulted in 4,930 new survey respondents, a recruitment rate of 14.9 percent. Wave sixteen therefore reproduced the response rate of wave eleven and wave fourteen.

99.3 percent of the respondents who completed the survey entered their e-mail address. Of the incomplete respondents, 95.7 percent entered their e-mail address. In sum, after subtracting respondents with mismatching credentials, 5,163 new **panel members** were recruited to the Norwegian Citizen Panel, resulting in a panel recruitment rate of 15.6 percent.

Further discussions in this report about new recruits in wave fourteen are based on data on survey respondents. However, since there is an almost perfect overlap between survey respondents and panel members, the descriptions are also valid for the panel members.

RESPONSES BY METHOD OF DATA COLLECTION

Table 2 Number of responses and response rates for the new panel members by the various stages of data collection

	Response	Response rate (%)	Cumulative Responses	Cumulative Response Rate (%)
Invitation (29th of October)	2,882	8.7 %	2,882	8.7 %
Postcard, reminder (12th of November)	1,189	3.6 %	4,071	12.3 %
SMS, reminder (13th of November)	859	2.6 %	4,930	14.9 %

Table 2 summarizes the effects of the various stages of data collection. The invitation letter accumulated 2,882 responses, the postcard 1,189 responses, and the SMS generated 859 responses: Resulting in a cumulative response rate of 14.9 percent. Compared to other waves of recruitment, wave 11, wave 14 and wave 16 has a substantially lower response rate. For a more detailed discussion, please see table 1.

RESPONSES OF EXISTING PANEL MEMBERS

Wave sixteen of the NCP also included data collection from existing members of the panel, recruited in wave 1, 3, 8, 11, and 14. Data collection among existing panel members was conducted in parallel with the recruitment of, and data collection among, new members.

RESPONSES BY METHOD OF DATA COLLECTION

The survey was distributed via email to 18,093 existing panel members on October 31th 2019. In these e-mails, the basic information about the Norwegian Citizen Panel was repeated, and the individual panel members received unique URLs that led to the questionnaire.

The invitation, the first reminder and the second reminder were all distributed via e-mail. The third, and last reminder was, depending on whether the individual panel member had a registered mobile phone number or not, distributed via SMS or e-mail. Prior to wave 16, 34.7 percent of the panel was registered with a mobile phone number.

Table 3: Responses and response rate for panel members by the different stages of data collection

	Response	Cumulative Responses	Response Rate (%)	Cumulative Response Rate
Invitation (31th of October)	4,269	4,269	39.2 %	39.2 %
1st reminder (7th of November)	2,197	6,466	20.2 %	59.3 %
2nd reminder (18th of November)	767	7,233	7.0 %	66.4 %
3rd reminder – email (21th of November)	447	7,680	4.1 %	70.5 %
3rd reminder – SMS (21th of November)	294	7,974	2.7 %	73.2 %

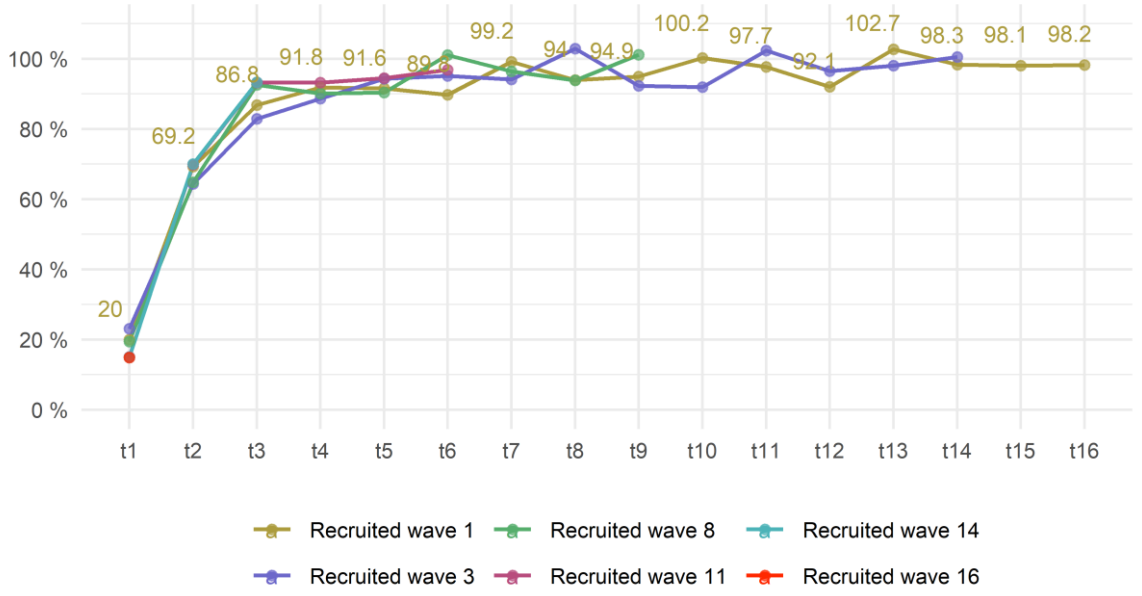
In total, the questionnaire received 7,974 answers from existing panel members. 4,269 respondents completed the survey in the period between the invitation and the first reminder (October 31th –November 7th), a response rate of 39.2 percent. The pattern is similar to earlier waves; the email invitation produces a higher number of respondents than the subsequent reminders. For details on the number of respondents after each reminder, we refer you to table 3.

As before we exclude respondents that have not participated in any of the last three waves when we calculate the response rate. This leaves us with 10,900 eligible respondents. The overall response rate, as reported in table 3, is **73.2 percent**.

RESPONSE OF EXISTING PANEL MEMBERS OVER TIME

The number of respondents in this last wave is as already mentioned 7,974 – compared to 8,105 in wave 15. This gives us an overall wave-to-wave retention rate of 98.3 percent. This is higher than the retention rate between wave 15 and wave 14. Figure 1 shows that the wave-to-wave retention rate increases substantially the first three waves, and thereafter the retention rate is stabilized and varies around the mean of 95 percent.

Figure 1: Wave-to-wave retention rate

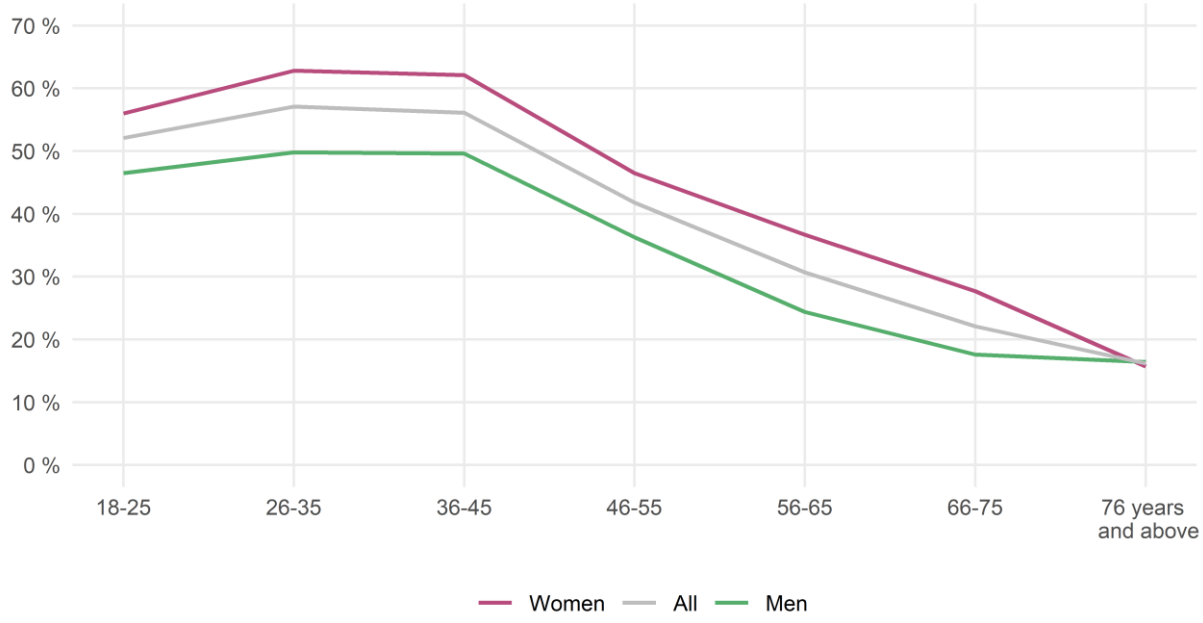


PLATFORMS

The questionnaire was prepared for data input via smart phones. In order to enhance the respondents' experience with the questionnaire, mobile users got a slightly different visual representation of most questions. For instance is a question grid presented as a set of individual questions on the same page, which is different from the desktop presentation where grid questions are presented in a table.

37.8 percent of all survey respondents that opened the questionnaire used a mobile phone. 7.8 percent of the mobile users did not complete to such an extent that they were classified as respondents in the wave 16. For non-mobile users the percentage was 4.1 percent. Mobile users were thus somewhat likely to leave the questionnaire before completion. This was also the case in previous waves.

Figure 2: Share of mobile users by gender and age in wave 16

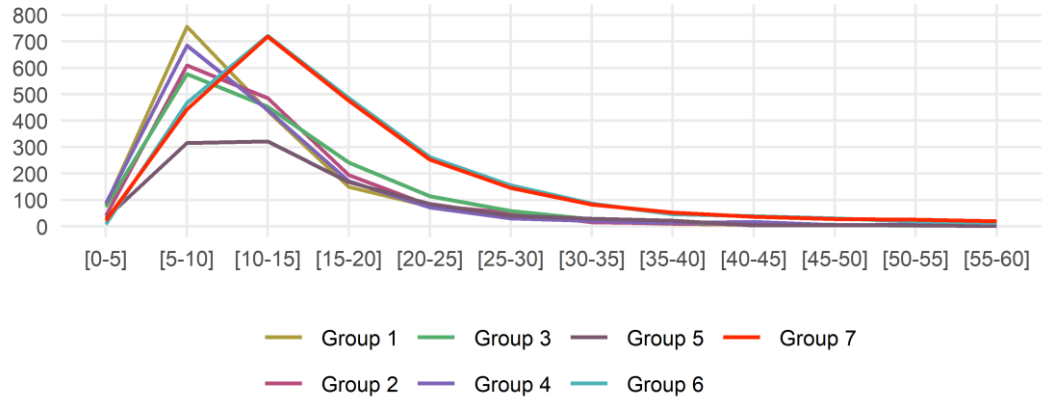


Respondents between 18 and 45 years old are more inclined than others to use their mobile phone when answering the questionnaire, as shown in figure 2. From 46 years and higher, the share of mobile users declines substantially. Overall, women are more inclined to use mobile to answer the questionnaire compared to men. The most frequent mobile users, both for men (50 percent) and women (62 percent), are between 26 and 45 years of age.

TIME USAGE

The average respondent used 15.4 minutes to complete the questionnaire. This is on par with what the respondents were told upon invitation. The challenge of measuring average time usage is that respondents may leave the questionnaire open in order to complete the survey later. This idle time causes an artificially high average for completing the survey. The average of 15.4 minutes therefore only includes the respondents which used less than, or equal to, 60 minutes.

Figure 3: Time usage of survey respondents in wave 16



As in earlier waves, the NCP questionnaire is divided into different subsets. Wave 16 consisted of seven subsets, group 1-7. The respondents recruited in wave 16 were assigned by random to group 6 or 7. The other panel members were assigned to group 1 - 4 by random, or allocated to a group based on answers in previous waves. Figure 3 and table 4 shows that the newly recruited respondents in group 6 and 7 spent on average more time completing the questionnaire than other respondents. This is partly explained by the fact that they, unlike already recruited panel members, were asked to register their email. Unfamiliarity with the NCP can also be an explanation.

Table 4: Average time usage (minutes) in each subset in wave 16

	All	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7
All users	15.1	12.2	13.3	14.0	12.7	15.0	17.9	18.0
Non-mobile users	16.0	13.1	13.6	14.7	13.6	16.0	18.9	18.8
Mobile users	13.6	11.1	12.8	12.9	11.5	13.5	15.9	16.4

As before, mobile users on average use substantially less time on the survey than non-mobile users. The documentation report from wave 7 showed that mobile users spend less time writing text on open text questions. Mobile users in wave 7 wrote on average 42 characters in the open text questions, while users answering on non-mobile platforms on average wrote 62 characters.

The same report also noted that mobile users spend considerable less time answering some of the more complex questions in the questionnaire (i.e. questions with long and/or high degree of complexity in the vignettes). This could imply that users on mobile platforms spend less time reading vignettes before answering the questions. 65 percent of the respondents answering “don’t know” on one specific, complex question in the wave 7 survey were mobile users, a significantly higher number than expected when we take into account that the percentage of respondents answering the survey on a mobile phone was 26 percent of the total sample. Our numbers show that mobile users on average spent less time than non-mobile users on 85 percent of the questions in the seventh wave.

REPRESENTATIVITY

In this section, we describe the representativity of the panel as a whole. First, we will discuss factors explaining representativity. Thereafter we apply demographic variables to present data on representativity by different strata. The data on representativity is the foundation for the section on weighting.

FACTORS EXPLAINING LACK OF REPRESENTATIVITY

There are two main points that can serve as explanations to non-response and lack of representativity when recruiting panel members and maintaining panel members:

- access to and familiarity with the internet (given that a web-based questionnaire was the only response mode made available)
- the motivation and interest of the respondents

The first challenge is strongly related to the age composition of the survey respondents. Although Norway has a very high computer and internet density, the probability of having an e-mail address, and the skills required to access and fill in an online questionnaire, normally decreases with increasing age. The second challenge, motivation and interest, is often explained by the respondents’ level of education. In addition to age and education, we added the variables of geography and gender in order to test the representativity of the survey respondents. The variables have the following categories:

- Age: 19-29 years, 30-59 years, 60 and above.

- Highest completed education: no education/elementary school, upper secondary, university/university college.
- Geography: Oslo/Akershus, Eastern Norway, Southern Norway, Western Norway, Trøndelag, Northern Norway.

THE REPRESENTATIVITY OF THE NORWEGIAN CITIZEN PANEL

The sampling frame of the survey equals to the Norwegian population above the age of 18, comprising a population of approximately 4,2 million individuals. Earlier reports have documented a systematic underrepresentation of respondents belonging to the two lowest educational groups, independent of gender and age. The underrepresentation is particularly strong for young men. As expected, individuals with education from universities or university colleges are overrepresented. All of these observations are still true for wave 16.

Table 5: Age distribution in the population and the net sample of wave 16

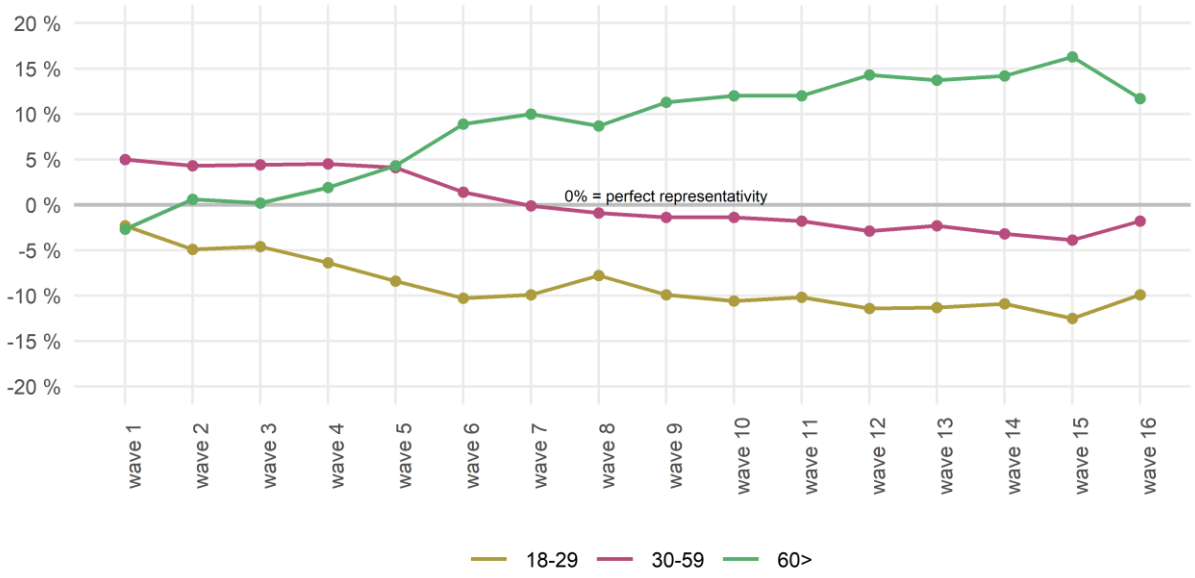
	18-29 years	30-59 years	60 years and above
Population	20.3 %	51.1 %	28.6 %
Net sample	10.4 %	48.8 %	40.8 %

From the age distribution presented in table 5, we see that 18-29 year olds are clearly underrepresented in the net sample of wave 16. The representation of the age group 30-59 years in the net sample is somewhat underrepresented compared to the distribution in the population, while respondents aged 60 years and above are clearly overrepresented.

The representativity of the youngest age bracket is improved in wave 16 compared to wave 15, due to recruitment of new panel members (figure 4). But the age group is still underrepresented by 10 percentage points, as it was from wave 9 to 14. The oldest age bracket is still largely overrepresented, but the overrepresentation has decreased in wave 16 compared to wave 12-15. The representation of respondents between 30-59 years is also improved, as their underrepresentation is decreased in wave 16.

Loyalty to the panel explains the development of the oldest age group in figure 4; they started out as underrepresented in wave 1, but thereafter they have become increasingly overrepresented. A lesser sense of loyalty/interest explains the development of 18-29 years old as they started out as underrepresented - an underrepresentation that has only increased.

Figure 4: Representativity of age groups from wave 1-16



New patterns emerge when adding gender in table 6; young men are more underrepresented than young women. In the oldest age group, men are clearly overrepresented, more so than women. Lastly, the middle-aged men in the net sample are underrepresented, while women in this age bracket is slightly overrepresented.

Table 6: Combined distribution of age and gender in the population and the net sample of wave 16

	18-29 years		30-59 years		60 years and above	
	Men	Women	Men	Women	Men	Women
Population	10.4 %	9.9 %	26.0 %	24.7 %	13.8 %	15.4 %
Net sample	4.3 %	6.1 %	22.6 %	26.2 %	22.3 %	18.5 %

The inclusion of educational level in table 7 reveals a systematic underrepresentation of respondents with little or no education, independent of age and gender. As discussed in relation to table 5, the underrepresentation is generally strong for young respondents, but especially so for young men with little to no education. The underrepresentation is also strong for middle-aged respondents with little or no education. There is also some underrepresentation of respondents aged 60 and above with little or no education.

Table 7: Combined distribution of age, gender and education in the population and the net sample of wave 16

		Population		Net sample	
		Men	Women	Men	Women
No education/elementary school	18-29 years	3.8 %	2.9 %	0.5 %	0.6 %
Upper secondary education	18-29 years	4.2 %	3.3 %	2.3 %	2.7 %
University/university college	18-29 years	2.3 %	3.6 %	1.5 %	2.8 %
No education/elementary school	30-59 years	5.5 %	4.6 %	1.0 %	0.8 %
Upper secondary education	30-59 years	11.2 %	7.9 %	8.0 %	6.6 %
University/university college	30-59 years	9.3 %	12.2 %	13.9 %	19.0 %
No education/elementary school	60 and above	3.1 %	4.4 %	2.2 %	1.9 %
Upper secondary education	60 and above	6.9 %	7.4 %	7.2 %	5.3 %
University/university college	60 and above	3.8 %	3.6 %	13.0 %	10.7 %

Respondents that have upper secondary education as their highest completed education are underrepresented in all groups, except men with upper secondary education aged 60 years or above. Those who have university or university college education are clearly overrepresented in the two oldest age brackets, independent of gender.

Figure 5: Representativity of education groups from wave 1-16

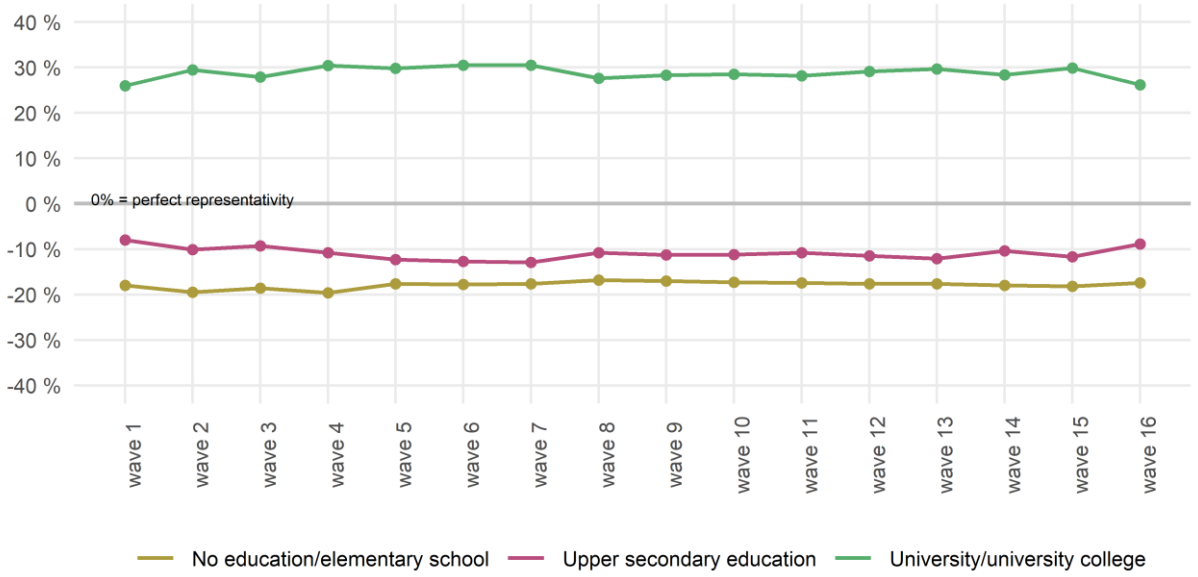


Figure 5 illustrates the representation of education groups since wave 1. The general trend is that the highly educated are overrepresented compared to those with less or no education. In wave 16, the overrepresentation of the highly education is slightly reduced, with a corresponding decrease in the

underrepresentation of respondents with upper secondary education. However, the overall picture is that there has been a slight increase in the overrepresentation of the highly educated respondents since wave 1 and a corresponding increase in the underrepresentation of respondents with less or no education.

In regard to geography, (table 8) we observe that the representation of panel members living in Trøndelag and Southern Norway are on level with the population, while the capital region (the counties of Oslo and Akershus) is clearly overrepresented. Western Norway is also overrepresented, but not as prominent as the capital region. Northern Norway and Eastern Norway meanwhile are underrepresented among the respondents in the sixteenth wave.

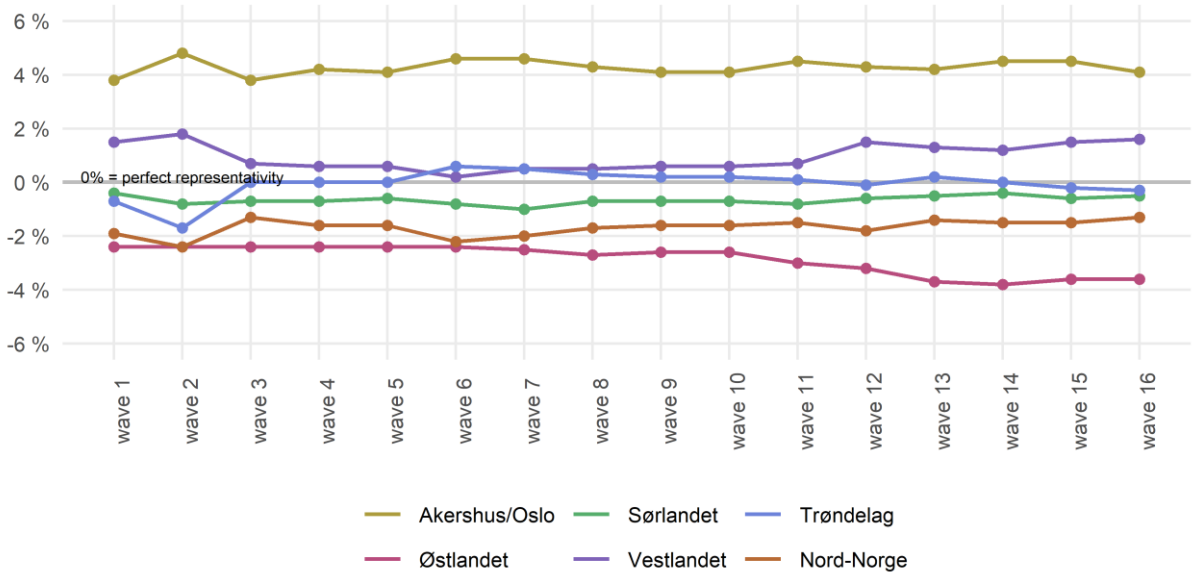
Table 8: Combined distribution of age, gender and geography in the population and the net sample of wave 16

		Population			Net sample		
		Men	Women	Total	Men	Women	Total
Akershus/Oslo	18-29 years	2.6 %	2.6 %	5.2 %	1.2 %	2.0 %	3.2 %
	30-59 years	6.8 %	6.5 %	13.3 %	6.4 %	8.4 %	14.8 %
	60 and above	2.8 %	3.2 %	5.9 %	5.6 %	4.8 %	10.4 %
	In total	12.1 %	12.3 %	**24.4 %**	13.2 %	15.2 %	**28.4 %**
Eastern Norway	18-29 years	2.5 %	2.3 %	4.8 %	0.8 %	1.1 %	1.9 %
	30-59 years	6.6 %	6.4 %	13.0 %	4.8 %	5.4 %	10.2 %
	60 and above	4.1 %	4.6 %	8.7 %	5.7 %	5.0 %	10.7 %
	In total	13.2 %	13.3 %	**26.5 %**	11.3 %	11.5 %	**22.8 %**
Southern Norway	18-29 years	0.6 %	0.6 %	1.2 %	0.2 %	0.3 %	0.5 %
	30-59 years	1.4 %	1.4 %	2.8 %	1.1 %	1.3 %	2.4 %
	60 and above	0.8 %	0.9 %	1.7 %	1.2 %	0.9 %	2.1 %
	In total	2.8 %	2.8 %	**5.7 %**	2.5 %	2.5 %	**5.0 %**
Western Norway	18-29 years	2.7 %	2.6 %	5.3 %	1.2 %	1.6 %	2.8 %
	30-59 years	6.7 %	6.2 %	12.9 %	6.5 %	7.0 %	13.5 %
	60 and above	3.5 %	3.8 %	7.3 %	6.0 %	5.0 %	11.0 %
	In total	12.9 %	12.6 %	**25.5 %**	13.7 %	13.6 %	**27.3 %**
Trøndelag	18-29 years	1.0 %	0.9 %	1.9 %	0.6 %	0.7 %	1.3 %
	30-59 years	2.2 %	2.0 %	4.2 %	2.0 %	2.0 %	4.0 %
	60 and above	1.2 %	1.3 %	2.6 %	1.8 %	1.4 %	3.2 %
	In total	4.4 %	4.3 %	**8.7 %**	4.4 %	4.1 %	**8.5 %**
Northern Norway	18-29 years	1.0 %	0.9 %	1.9 %	0.4 %	0.4 %	0.8 %
	30-59 years	2.3 %	2.1 %	4.4 %	1.7 %	2.2 %	3.9 %
	60 and above	1.4 %	1.5 %	2.9 %	1.9 %	1.4 %	3.3 %
	In total	4.7 %	4.6 %	**9.3 %**	4.0 %	4.0 %	**8.0 %**

The clearly most overrepresented group are men and women aged 60 years and above living in the capital area. This group accounts for 5.9 percent of the population, while 10.4 percent of the respondents in wave sixteen belongs to this demography. The most underrepresented groups are men and women below 60 years in Eastern Norway, in addition to young men and women in all regions.

The representativity of regions has more or less gone unchanged from wave 1 through wave 16 (figure 6 below). Once recruited it does not seem that geography has an important role in determining the loyalty of the respondent. At least not at the same level as age and education.

Figure 6: Representativity of regions from wave 1-16



WEIGHTING

To compensate for the observed biases, we have calculated a set of weights. The weights are equal to the relation between a given strata in the population and the total population, divided by the relation between a given strata in the net sample and the total net sample.[6] This procedure returns values around 1, but above 0. Respondents belonging to a stratum that is underrepresented will receive a weight above 1 and respondents belonging to an overrepresented stratum will receive a weight below 1. We have listed the weights of the different strata in table 11 in the appendix.

When calculating the weights, information regarding the respondents' geographical location, gender and age is based on registry data. Information on these variables was included in the sample file we received from the Norwegian National Registry. Information regarding the level of education is collected from the NCP surveys. 3.2 percent of the sixteenth wave net sample have not answered the question about level of education. Because of this, two different weights have been calculated:

- **Weight 1** is based on demographic variables only (age, gender and geography)
- **Weight 2** combines the demographic variables with education. Respondents with missing data on the education variable are only weighted on demography (the education component of the weight is in these cases set to 1).

The variables have the following categories:

- **Age**: 19-29 years, 30-59 years, 60 and above.
- **Highest completed education**: no education/elementary school, upper secondary, university/university college.

6 The applied formula for weight w_i for element i, in strata h is: $w_i = \frac{N_h/N}{n_h/n}$

- **Geography**: Oslo/Akershus, Eastern Norway, Southern Norway, Western Norway, Trøndelag, Northern Norway.

The method for calculating weights is the same as in previous waves.

When applied, both weights will provide a weighted N equal to the number of respondents in the dataset.

As shown in the discussion above, of the factors considered, level of education creates the most bias. We therefore strongly recommend using weight 2 in most statistical analyses, as this weight provides the most accurate compensation for the various sources of bias in the net sample. Table 9 shows the effects of weight 2 on the distribution of self-reported level of education in the net sample. As we can observe, the weight gives the sample a perfect distribution compared to the population. It is however important to stress that the distribution when not weighted is far from ideal, with a clear underrepresentation of the population with low levels of education.

Table 9: Effect of weight 2 on self-reported level of education

	Sample - not weighted	**Sample - weighted**	**Population**	**Difference between sample and population**	**Difference between weighted sample and population**
No education/elementary school	6.9 %	24.3 %	24.3 %	-17.4	0.0
Upper secondary eduction	32.0 %	40.9 %	40.9 %	-8.9	0.0
University/university college	61.0 %	34.8 %	34.8 %	26.2	0.0

Table 10 shows the effects of weight 2 on the distribution of party affiliation in the net sample. The survey was conducted two months after the municipal and county council elections and the respondents were asked for which municipal party they casted their vote. In table 10 we compare the election result of the municipal elections with the self-reported party preference of the respondents.

The Norwegian Citizen Panel has an overrepresentation of respondents affiliated with The Conservative Party, The Liberal Party, The Socialist Left Party, The Green Party and The Red Party. The Christian Democrats, The Progress Party, The Centre Party, The Labour Party are underrepresented in the panel.

When the sample is weighted, the overall distribution of party preferences in the panel is more aligned with the election results. The average difference between the sample and the population is reduced to 1.2 from 1.5. Five parties are closer to the election results when the distribution is weighted, the turnout of The Green Party and The Red Party remains unchanged, while the turnout of The Christian Democrats and The Conservative Party is further away from the election results after weighting.

Table 10: Effect of weight 2 on party affiliation

	Sample - not weighted	Sample - weighted	Election result	Difference between sample and population	Difference between weighted sample and population
The Christian Democrats	3.7 %	3.3 %	4.0 %	-0.3	-0.7
The Conservative Party	20.8 %	18.6 %	20.1 %	0.7	-1.5
The Progress Party	5.7 %	6.3 %	8.2 %	-2.5	-1.9
The Liberal Party	4.3 %	3.9 %	3.9 %	0.4	0.0
The Socialist Left Party	8.6 %	7.8 %	6.1 %	2.5	1.7
The Centre Party	13.1 %	14.6 %	14.4 %	-1.3	0.2
The Green Party	9.4 %	9.4 %	6.8 %	2.6	2.6
The Labour Party	22.5 %	23.2 %	24.8 %	-2.3	-1.6
The Red Party	5.2 %	5.2 %	3.8 %	1.4	1.4
Other	6.6 %	7.7 %	7.9 %	-1.3	-0.2
				Avg difference 1.5	**1.2**

APPENDIX

Table 11: Weights applied to different strata (weight 2)

			Men	Women				Men	Women
Oslo/Akershus	18-29 years	No education/elementary school	9.4	4.0	Western Norway	18-29 years	No education/elementary school	6.1	5.2
		Upper secondary education	1.7	1.0			Upper secondary education	1.9	1.4
		University/university college	1.5	1.1			University/university college	1.6	1.2
	30-59 years	No education/elementary school	6.9	5.7		30-59 years	No education/elementary school	5.1	5.1
		Upper secondary education	1.4	1.1			Upper secondary education	1.3	1.1
		University/university college	0.7	0.6			University/university college	0.6	0.6
	60 and above	No education/elementary school	1.4	1.8		60 and above	No education/elementary school	1.2	2.3
		Upper secondary education	0.9	1.2			Upper secondary education	0.9	1.2
		University/university college	0.3	0.3			University/university college	0.3	0.3
Eastern Norway	18-29 years	No education/elementary school	10.9	6.5	Trøndelag	18-29 years	No education/elementary school	4.8	3.9
		Upper secondary education	2.3	1.4			Upper secondary education	1.2	1.1
		University/university college	1.6	1.8			University/university college	1.4	1.1
	30-59 years	No education/elementary school	6.7	7.2		30-59 years	No education/elementary school	4.6	5.1
		Upper secondary education	1.5	1.4			Upper secondary education	1.4	1.5
		University/university college	0.7	0.8			University/university college	0.6	0.7
	60 and above	No education/elementary school	1.8	2.3		60 and above	No education/elementary school	1.4	2.7
		Upper secondary education	1.0	1.5			Upper secondary education	1.0	1.6
		University/university college	0.3	0.3			University/university college	0.3	0.4
Southern Norway	18-29 years	No education/elementary school	14.4	3.6	Northern Norway	18-29 years	No education/elementary school	8.6	5.3
		Upper secondary education	2.0	1.4			Upper secondary education	1.8	1.9
		University/university college	1.5	1.6			University/university college	2.1	1.8
	30-59 years	No education/elementary school	4.0	4.3		30-59 years	No education/elementary school	4.7	3.7
		Upper secondary education	1.6	1.3			Upper secondary education	1.7	1.2
		University/university college	0.7	0.7			University/university college	0.7	0.7
	60 and above	No education/elementary school	1.5	2.2		60 and above	No education/elementary school	1.3	3.5
		Upper secondary education	1.0	1.7			Upper secondary education	1.1	1.8
		University/university college	0.3	0.4			University/university college	0.3	0.3