# Norwegian Citizen Panel

## 2017, Eight Wave

## Methodology report

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NORSK MEDBORGERPANEL

IDEAS2EVIDENCE
Bygger kunnskap

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# BACKGROUND

This report describes the procedures of data collection in the eight wave of The Norwegian Citizen Panel. Further, the report discusses recruitment of new panel members in the eight wave, the representativity of the panel and how the weights are calculated.

The Norwegian Citizen Panel (NCP) was established as a collaboration between several departments at the Faculty of Social Sciences at the University of Bergen and the UNI Research Rokkan Centre.

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 web-based research software Confirmit administers the surveys and the panel. 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 both large-N and small-N pilot testing before data collection. The large-N pilot was done in cooperation with a local high school. In addition, the survey was tested extensively during the development phase by ideas2evidence and the researchers involved in the project.

One technical revision was needed after the large-N pilot. The large-N pilot revealed an error caused by the newly develop progress bar. The error occurred in 2 of 350 instances (0.6%). The error caused the answer scales to disappear on most questions. As a consequence, the respondent was forced to exit the questionnaire and wait for assistance in order to continue. Both respondents that suffered from the error used an older version of the Safari web browser (Safari 9.2 or older). The cause of the error was corrected and the two respondents was asked to re-enter the questionnaire. They did so successfully without suffering from the error. At this point the error was thought to be corrected.

However, when the survey was launched it soon became apparent that the error was not corrected properly. 21 respondents reported back to the panel administrator that the answer scales were gone. 90 percent of the 21 respondents used Safari 9.1. All respondents that suffered an error was asked to open the questionnaire with any other browser. In most cases this solved the problem. Therefore, all respondents received an email with an apology and an explanation of how they could re-enter and complete the questionnaire. 13 of the 21 respondents completed the survey.

It is reasonable to assume that not all respondents would report back that they suffered from an error. Our analysis show that the maximum number of respondents that could have suffered from such an error is 0.5 percent (45 respondents) of all who entered the questionnaire. The error was therefore very unfortunate for those involved, but not decisive for the data collection as a whole.

The cause of the error was corrected and tested prior to wave 9. At the time of writing, wave 9 is about to close for data collection and no similar error has occurred.

With the exception of this error, the data collection of wave 8 was carried out without any irregularities.

## RANDOMIZATION PROCEDURES

Each wave of NCP has an extensive use of randomization procedures. The context of each randomization procedure may vary, [1] 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()[2] is a key function, in combination with Math.floor()[3]. 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 [4]:

[1] 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.

[2] Please see following resource (or other internet resources):https://developer.mozilla.org/en-US/docs/Web/JavaScript/Reference/Global_Objects/Math/random

[3] Please see following resource (or other internet resources):https://developer.mozilla.org/en-US/docs/Web/JavaScript/Reference/Global_Objects/Math/floor

[4] 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;
}
```

## RE-RANDOMIZATION OF PANEL MEMBERS INTO NEW THEMATIC SUBSETS

In earlier waves the NCP surveys (wave 3 – wave7) have been organized in thematic subsets (U1-U4). The respondents were assigned into one of these subsets by random in wave 3. In the eight wave these subsets have been re-randomized. The re-randomization was motivated by the risk of exhausting the respondents on certain topics. Respondents have made comments in the questionnaire that would indicate such an exhaustion.

The new thematic subsets are now called V1, V2, V3, and V4. Since no parameters were defined for the re-randomization, about 25 percent of respondents are randomized into what essentially is the same subsets as before.

**Table 1: Results of re-randomization of thematic subsets**

| | | |
|---|---|---|
| U1 | V1 | 6.70 % |
| U1 | V2 | 6.20 % |
| U1 | V3 | 6.40 % |
| U1 | V4 | 5.90 % |
| U2 | V1 | 6.50 % |
| U2 | V2 | 5.70 % |
| U2 | V3 | 6.40 % |
| U2 | V4 | 6.40 % |
| U3 | V1 | 6.10 % |
| U3 | V2 | 5.90 % |
| U3 | V3 | 6.10 % |
| U3 | V4 | 6.20 % |
| U4 | V1 | 7.30 % |
| U4 | V2 | 6.80 % |
| U4 | V3 | 5.50 % |
| U4 | V4 | 5.90 % |

## PANEL RECRUITMENT FIRST AND THIRD WAVE

Panel members were recruited in wave 1 and wave 3. The samples in wave 1 and wave 3 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 has partly outsourced the administration to the private IT-company Evry. Evry drew the sample on behalf of the Citizen Panel after relevant permissions were acquired from the Norwegian Tax Administration.

25,000 people over the age of 18 were, in both the first and the third wave, 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 included in wave 3 only). The sample excluded persons without a current home address in Norway.

After receiving the data, everyone over the age of 95 was excluded from the sample.

For a detailed description of the recruitment process in wave 1 and 3, we refer to the respective methodology reports for each wave. Note, however, that the process differed between these two waves in that recruitment in the first wave was done through postal recruitment only, while we in the third wave, in addition to postal recruitment, also sent out reminders by text message to all respondents with available phone numbers, and telephonic reminders to a randomly drawn subset of the gross sample.

The total recruitment rate in these two waves were respectively 20 percent in the first wave and 23 percent in the third wave.

## DATA COLLECTION EIGHT WAVE

### RECRUITING A NEW SET OF PANEL MEMBERS

As in the first and third wave of recruitment a gross sample was drawn from the population registry. In wave eight however, the gross sample consisted of 22,000 individuals compared to 25,000 in earlier recruitment processes. As before, Evry drew the sample on behalf of the Citizen Panel after the necessary permissions were acquired from the Norwegian Tax Administration.

22,000 people over the age of 18 were randomly drawn from the register. The extracted information was a) last name, b) first name, c) address, d) gender, e) telephone number(s) (if available) and, f) age. The sample excluded individuals without a current home address in Norway.

#### THE RECRUITMENT PROCESS

New panel members were recruited in multiple steps.

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 (20 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 6th of March 2017.

A reminder post card was sent on the 16th of March 2017 to those respondents who a) had not logged into the survey, or b) had neither completed the survey nor provided their email address. Respondents were encouraged to join the panel, with reference to the invitation letter. The unique log-in ID provided in the original letter was also included in the post card.

Thereafter, respondent that had not responded to the survey received a text message 30th of March 2017. A personal URL was given in the text message. Respondents without a registered phone number received a second post card reminder. The post cards were sent out on the 28th of March 2017.

## 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 defined as respondents who complete a large enough share of the questionnaire, regardless of whether they have entered their e-mail address or not.

Out of the 22,000 letters that were sent out, 479 were returned, and 23 respondents opted out. 20.2 percent (4,349) of the remaining 21,498 logged on and accessed the survey. 4,039 completed the questionnaire, and 310 individuals exited the questionnaire before completion, though 52.2 percent of these responses are kept as a part of the survey data. The remaining 148 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 third wave recruitment to the Norwegian Citizen Survey gave 4,177 new **survey respondents**. This gives a recruitment rate of 19.4 percent. Wave eight therefore had a lower recruitment rate than wave 1 and wave 3.

98.3 percent of the respondents who completed the survey entered their e-mail address. Of the incomplete respondents, 86.4 percent entered their e-mail address. In sum, after subtracting respondents with mismatching credentials, 4,245 new **panel members** were recruited to the Norwegian Citizen Panel. This gives a panel recruitment rate of 19.7 percent.

Further discussions in this report about new recruits in wave eight 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 response and response rate for the new panel members by the various stages of data collection**

| | Response | Cumulative Response | Response Rate (%) | Cumulative Response Rate (%) |
|---|---|---|---|---|
| Invitation (6th of March) | 1871 | 1871 | 8.7 % | 8.7 % |
| 1st postcard (16th of March) | 1793 | 3664 | 8.3 % | 17.0 % |
| 2nd reminder - postcard (28th of March) | 125 | 3789 | 0.6 % | 17.6 % |
| 2nd reminder – SMS (30th of March) | 388 | 4177 | 1.8 % | 19.4 % |

Table 2 summarizes the effects of the various stages of data collection. The invitation letter accumulated 1,871 responses. Reminder no. 1 accumulated almost as many as the invitational letter, and resulted in a response rate of 17.0 percent before sending the second postcard. At this stage, the results from the recruitment process in wave eight is two percentage points behind the recruitment conducted in wave 1 and 3. The second

postcard and text message accumulated 513 respondents, resulting in a cumulative response rate of 19.4 percent.

## RESPONSE OF EXISTING PANEL MEMBERS

Wave eight of the NCP also included data collection from existing members of the panel, recruited in the first and the third wave. 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 launched March 7th 2017. It was sent to the email accounts of the panel's 10,007 members. In these e-mails, the basic information about the 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 has a registered mobile phone or not, distributed via SMS and e-mail.

**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 (7th of March) | 1895 | 1895 | 31.1 % | 31.1 % |
| 1st reminder (10th of March) | 1304 | 3199 | 21.4 % | 52.6 % |
| 2nd reminder (16th of March) | 684 | 3883 | 11.2 % | 63.8 % |
| 3rd reminder – email (21th of March) | 65 | 3948 | 1.1 % | 64.9 % |
| 3rd reminder – SMS (21th of March) | 487 | 4435 | 8.0 % | 72.9 % |

In total, the questionnaire received 4,435 answers. 1,895 respondents completed the survey in the period between the invitation and the first reminder (March 7th – 10th), a response rate of 31.1 percent. The pattern is similar to earlier waves; the email invitation produces a higher number of respondents than the subsequent reminders, and there is a considerable drop in number of responses between the first and the second reminder. For details on the number of respondents after each reminder, we refer you to table 3.

The overall response rate, as reported in table 3, is **72.9 percent**. As before we exclude respondents that have not participated in any of the last three waves when we are calculating the response rate. This leaves us with with 6,087 eligible respondents

### RESPONSE OF EXISTING PANEL MEMBERS OVER TIME

The number of respondents in this last wave is as already mentioned 4,435 – compared to 4,689 in wave 7. This gives us an overall wave-to-wave retention rate of 94.5 percent. 82 percent of the 4,435 also answered the questionnaire in wave 7. Panel members recruited in wave 3 have a marginally higher retention rate (95.1 percent) compared to the respondents recruited in wave 1 (94 percent).[5] This means that the retention rate of panel members recruited in wave 1 has normalized itself after the rate of 99.2 percent in t7.[6]

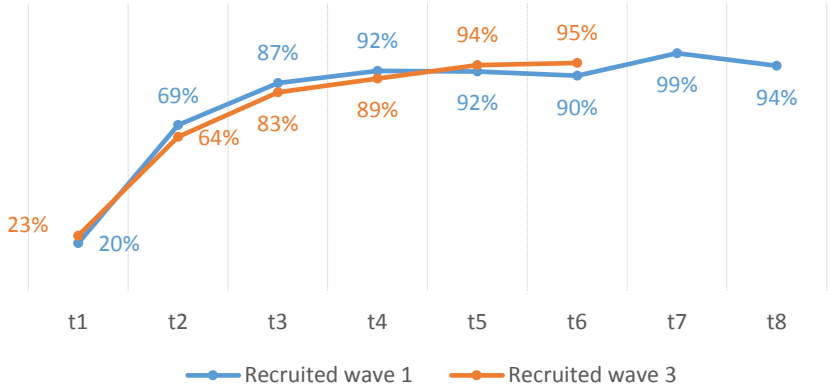
On a more general note, figure 1 shows that most of the respondents who become inactive do so between t1 and t2. The respondents that still are active after the third survey have a high probability of staying an active

[5] Please note that t1 equals to wave 1 for respondents recruited in wave 1 and wave 3 for respondents recruited in wave 3.

[6] Please confer the methodology report from wave 7 for a more thorough discussion on this matter.

member. The explanation for this is that the share of highly motivated panel member within the active group increases over time. Consequently, the panel has a bedrock of responses that creates a less volatile retention rate from t3 and onwards.

**Figure 1: Wave-to-wave retention rate**




When comparing the retention rate by when the respondents were recruited, we note that the response rate of the panel members recruited in wave 3 are somewhat lower from t2-t4. This can be explained by the differences in recruitment strategy. The recruitment strategy in wave 3 utilized two more reminders than the recruitment strategy in wave 1.[7] This resulted in a higher recruitment rate (t1). However, what this figure suggests is that panel members who need multiple reminders in order to be recruited are not as loyal as those who need fewer reminders.

**Figure 2: Wave-to-wave retention in number of respondents**

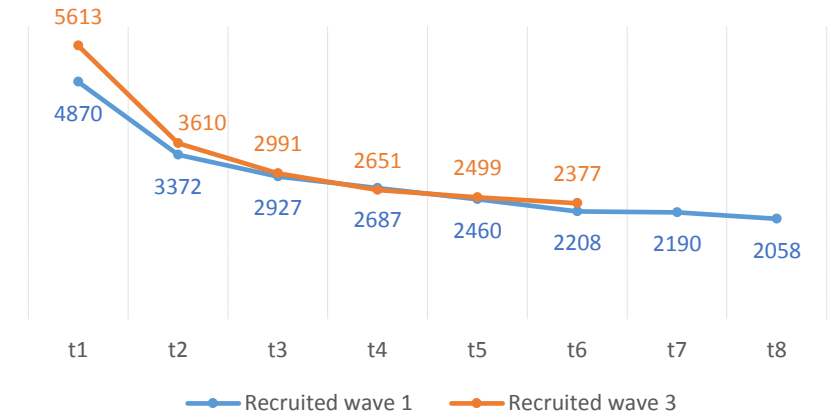



Figure 2 illustrates the same point, but from a different perspective. The figure shows the actual number of respondents in each wave over time. What becomes clear is that the additional respondents generated by the additional reminders are gone by t3. After t3, the number of respondents from the different recruitment strategies are more or less identical.

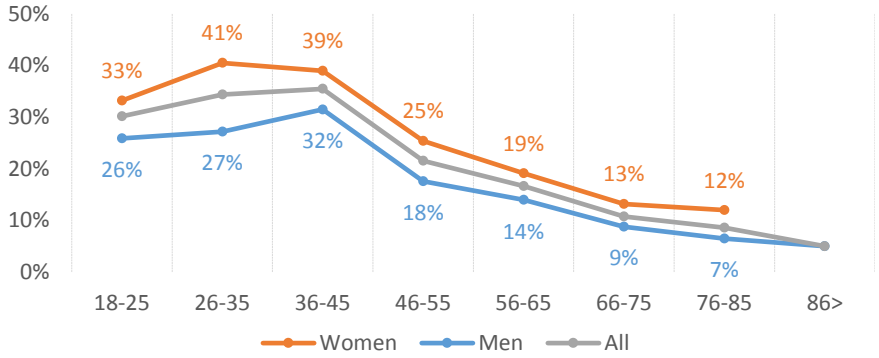
[7] Please confer the respective methodology reports for a more detailed review of the recruitment strategies.

## 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 different visual representation of some questions.

22.8 percent of all survey respondents that opened the questionnaire used a mobile phone. 7 percent of the mobile users did not complete to such an extent that they were classified as respondents in the eight wave. For non-mobile users the percentage was 3.7 percent. Mobile users were thus more likely to leave the questionnaire before completion. This was also the case in previous waves.

**Figure 3: Share of mobile users by gender and age**



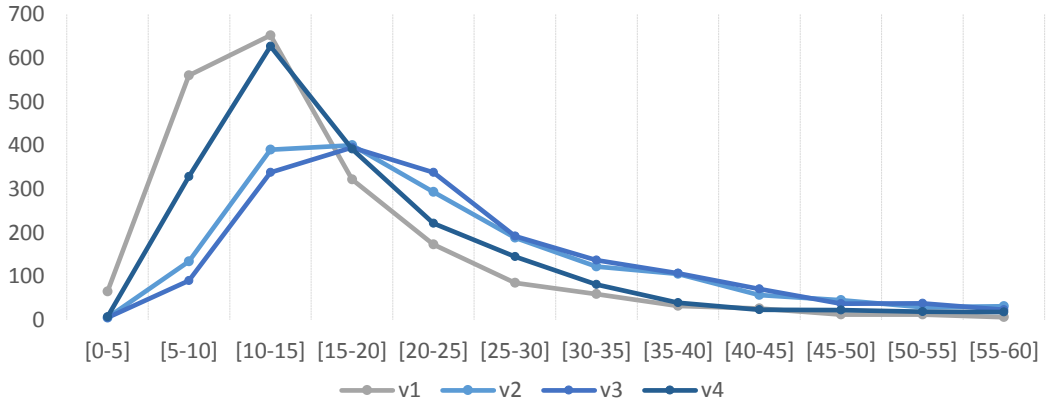

Respondents between 18 and 45 years are more inclined than others to use their mobile phone when answering the questionnaire, as shown in figure 3. Respondents from 36-45 years (both men and women) are the ones that uses their mobile most frequent. From 46 years and higher, the share of mobile users declines substantially.

Moreover, women are in general more inclined to use mobile to answer the questionnaire compared to men. 41 percent of women 26-35 years of age use their mobile when filling out the questionnaire, compared to 27 percent of the men in the same age group.

## TIME USAGE

The average respondent used 20 minutes to complete the questionnaire. This is in compliance with what the respondent were told when invited. 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 20 minutes therefore only includes the 90 percent of the respondents, which used less than, or equal to, 60 minutes.

**Figure 4: Time usage of survey respondents in the eight wave**



As in earlier waves, the NCP questionnaire is divided into different subsets (V1-V4). Figure 4 and table 4 shows that respondents that answered questions in the V1 and V4 subsets spent more time on the questionnaire, compared to the V2 and V3 subsets. The breakdown of time usage for each subset is shown in table 4.

**Table 4: Average time usage (minutes) in each subset in the eight wave**

| | All respondents | V1-respondents | V2-respondents | V3-respondents | V4-respondents |
|---|---|---|---|---|---|
| All users | 19.9 | 15.6 | 23.0 | 23.8 | 18.4 |
| Non-mobile users | 20.4 | 16.0 | 23.5 | 24.2 | 18.8 |
| Mobile users | 18.2 | 13.6 | 21.0 | 22.2 | 16.7 |

It is interesting to note that 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 write on average 42 characters in the open text questions, while users answering on non-mobile platforms on average write 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 is 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. Please see appendix for isolated statistics on respondents recruited in wave eight. 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:

- 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 4,0 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 the eight wave.

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

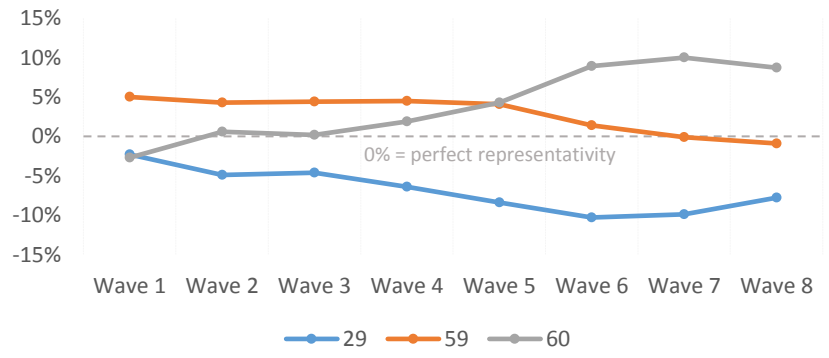
| | 18-29 years | 30-59 years | 60 years and above |
|---|---|---|---|
| Population | 20.5 % | 51.6 % | 28.0 % |
| Net sample - w08 | 12.7 % | 50.6 % | 36.7 % |

From the age distribution presented in table 5, we see that 18-29 year olds are underrepresented in the net sample of the eight wave. The representation of the age group 30-59 years in the net sample is on par with the age distribution in the population, while respondents aged 60 years and above are clearly overrepresented. Looking at the new recruits from wave eight alone (table 11 in appendix), we see that respondents of 30-59 years of age is far less overrepresented (6-7 percentage points) compared to the results of the recruitment in wave 1 and wave 3.

As a result of recruiting new panel members, the underrepresentation of 18-29 year olds is less prominent in this wave compared to the seventh wave (figure 5). Likewise, the oldest age group is less overrepresented in wave eight than in previous waves. Respondents between 30 and 59 years have in most waves been overrepresented. However, this overrepresentation started decreasing in wave 6, a trend that has continued into wave eight and has resulted in an marginal underrepresentation.

Loyalty to the panel explains the development of the oldest age group in figure 5; they started out as underrepresented in wave 1, but thereafter they have become increasingly overrepresented. A less 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 5: Representativity of age groups from wave 1- wave 8**



New patterns emerge when adding gender in table 6; young men are more underrepresented than young women are. 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 are overrepresented.

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

| | 18-29 years | | 30-59 years | | 60 years and above | |
|---|---|---|---|---|---|---|
| | Men | Women | Men | Women | Men | Women |
| Population | 10.50 % | 10.00 % | 26.50 % | 25.10 % | 13.00 % | 14.90 % |
| Net sample - w08 | 5.4 % | 7.3 % | 24.2 % | 26.4 % | 20.1 % | 16.6 % |

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 strong for young respondents. 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 low education.

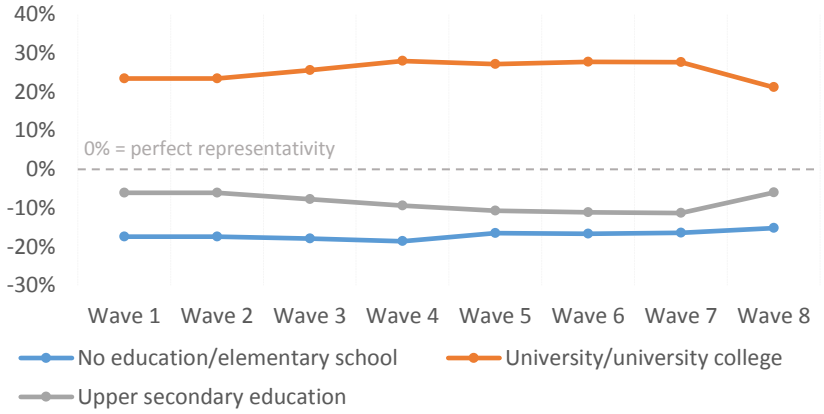
Respondents that have upper secondary education as their highest completed education are somewhat underrepresented in most groups. The exception is men aged 60 and above who is somewhat overrepresented, and the women aged 18-29 years who is on par with the distribution in the population. Those who have university or university college education are clearly overrepresented in the two oldest age brackets, independent of gender.

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

| | | Population | | Net sample - w08 | |
|---|---|---|---|---|---|
| | | Men | Women | Men | Women |
| No education/elementary school | 18-29 years | 4.1 % | 3.2 % | 1.1 % | 1.4 % |
| Upper secondary education | | 4.2 % | 3.4 % | 2.9 % | 3.4 % |
| University/university college | | 2.2 % | 3.4 % | 1.4 % | 2.4 % |
| No education/elementary school | 30-59 years | 5.5 % | 4.9 % | 1.4 % | 1.3 % |
| Upper secondary education | | 12.1 % | 8.8 % | 10.2 % | 8.1 % |
| University/university college | | 9.0 % | 11.4 % | 13.2 % | 17.1 % |
| No education/elementary school | 60 and above | 3.2 % | 4.9 % | 2.8 % | 2.8 % |
| Upper secondary education | | 6.5 % | 7.1 % | 6.7 % | 4.7 % |
| University/university college | | 3.3 % | 2.9 % | 10.5 % | 8.8 % |

Figure 6 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. Recruiting new respondents in wave 8 corrected somewhat the underrepresentation of respondents with upper secondary education. However, the level of underrepresentation of respondents with no education/elementary education remains the same.

**Figure 6: Representativity of education groups from wave 1- wave 8**



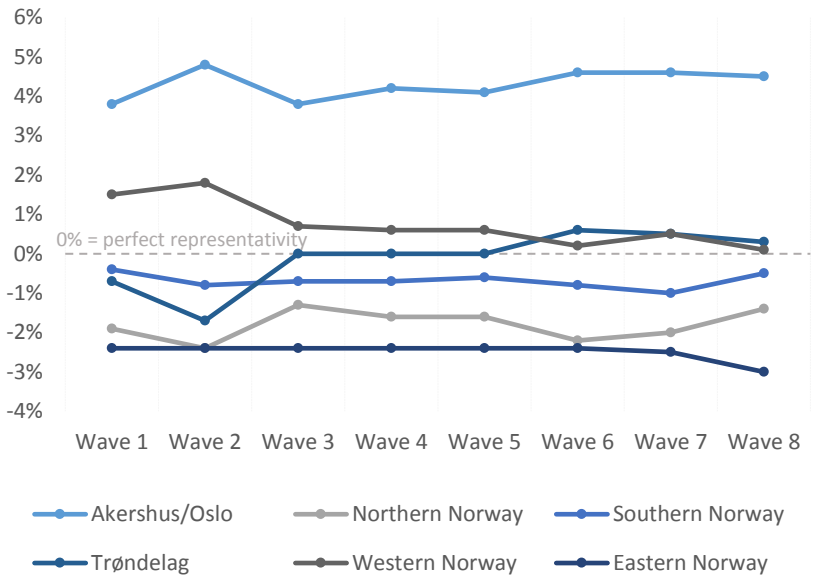

In regards to geography, (table 8) we observe that Western Norway, Trøndelag and Southern Norway are all on level with the population, while the capital area – the counties of Oslo and Akershus – is clearly overrepresented. Northern Norway and Eastern Norway meanwhile are underrepresented among the respondents in the eight wave.

The clearly most overrepresented group are men and women aged 60 years and above living in the capital area. This group accounts for 5.6 percent of the population but 9.8 percent of the respondents in wave eight belongs to this demography. The most underrepresented groups are middle aged and young men in Eastern Norway, and young men and women in Western Norway.

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

| | | Population | | | Net sample - w08 | | |
|---|---|---|---|---|---|---|---|
| | | Men | Women | Total | Men | Women | Total |
| Akershus/Oslo | 18-29 years | 2.5 % | 2.6 % | 5.1 % | 1.5 % | 2.3 % | 3.8 % |
| | 30-59 years | 6.7 % | 6.4 % | 13.1 % | 6.8 % | 8.1 % | 14.9 % |
| | 60 and above | 2.6 % | 3.0 % | 5.6 % | 5.2 % | 4.6 % | 9.8 % |
| | In total | 11.8 % | 12.0 % | **23.8 %** | 13.5 % | 15.0 % | **28.5 %** |
| Eastern Norway | 18-29 years | 2.5 % | 2.3 % | 4.8 % | 1.1 % | 1.6 % | 2.7 % |
| | 30-59 years | 6.8 % | 6.6 % | 13.4 % | 5.1 % | 6.1 % | 11.2 % |
| | 60 and above | 3.9 % | 4.5 % | 8.4 % | 5.6 % | 4.2 % | 9.8 % |
| | In total | 13.2 % | 13.4 % | **26.6 %** | 11.8 % | 11.9 % | **23.7 %** |
| Southern Norway | 18-29 years | 0.6 % | 0.6 % | 1.2 % | 0.3 % | 0.3 % | 0.6 % |
| | 30-59 years | 1.5 % | 1.4 % | 2.9 % | 1.3 % | 1.5 % | 2.8 % |
| | 60 and above | 0.7 % | 0.9 % | 1.6 % | 1.0 % | 0.8 % | 1.8 % |
| | In total | 2.8 % | 2.9 % | **5.7 %** | 2.6 % | 2.6 % | **5.2 %** |
| Western Norway | 18-29 years | 2.8 % | 2.7 % | 5.5 % | 1.4 % | 2.0 % | 3.4 % |
| | 30-59 years | 6.9 % | 6.3 % | 13.2 % | 6.6 % | 6.6 % | 13.2 % |
| | 60 and above | 3.3 % | 3.7 % | 7.0 % | 5.1 % | 4.3 % | 9.4 % |
| | In total | 13.0 % | 12.7 % | **25.7 %** | 13.1 % | 12.9 % | **26.0 %** |
| Trøndelag | 18-29 years | 1.0 % | 0.9 % | 1.9 % | 0.7 % | 0.5 % | 1.2 % |
| | 30-59 years | 2.2 % | 2.1 % | 4.3 % | 2.4 % | 2.3 % | 4.7 % |
| | 60 and above | 1.2 % | 1.3 % | 2.5 % | 1.6 % | 1.4 % | 3.0 % |
| | In total | 4.4 % | 4.3 % | **8.7 %** | 4.7 % | 4.2 % | **8.9 %** |
| Northern Norway | 18-29 years | 1.0 % | 0.9 % | 1.9 % | 0.4 % | 0.6 % | 1.0 % |
| | 30-59 years | 2.4 % | 2.2 % | 4.6 % | 2.1 % | 1.8 % | 3.9 % |
| | 60 and above | 1.4 % | 1.5 % | 2.9 % | 1.6 % | 1.4 % | 3.0 % |
| | In total | 4.8 % | 4.6 % | **9.4 %** | 4.1 % | 3.8 % | **7.9 %** |

**Figure 7: Representativity of regions from wave 1- wave 8**




The representativity of regions has more or less gone unchanged from wave 1 through wave 8 (figure 7 above). 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.

## 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.[8] 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 10 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 from the survey. 4 percent of the seventh 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:

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

- **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 method for calculating weights is equal to that of 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 | 10.7 % | 25.9 % | 25.9 % | -15.2 % | 0.0 % |
| Upper secondary education | 35.9 % | 41.9 % | 41.9 % | - 6.0 % | 0.0 % |
| University/university college | 53.4 % | 32.2 % | 32.2 % | 21.2 % | 0.0 % |

Furthermore, literature on surveys has shown that individuals who are interested in politics are more likely to participate in surveys than individuals who are not. This particularly holds true for surveys with politics as a topic.[9]

**Figure 8: Effect of weight 2 on self-reported political interest**

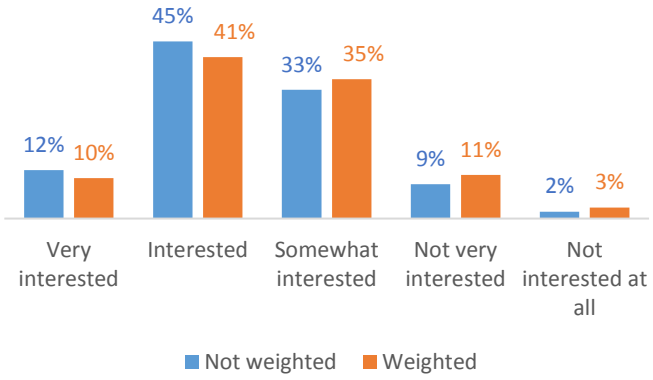



Figure 8 displays the distribution of level of political interest, weighted and not weighted. Respondents who self-identify as interested in politics (very interested and interested) make up 57 percent in the not weighted distribution. 33 percent are somewhat interested, meaning that 9 percent of the respondent's report being somewhat or not interested in politics. In the weighted statistics, the share of respondents who self-identify as being interested in politics reaches 51 percent. Those who report not being interested (not very interested and not interested at all) in politics make up 14 percent.

9 Groves, Robert M., Stanley Presser and Sarah Dipko (2004): "The Role of Topic Interest in Survey Participation Decisions". *Public Opinion Quarterly*. Vol. 68, No. 1:2-31

## APPENDIX

**Table 10: Weights applied to different strata (weight 2)**

| | | | Men | Women | | | | Men | Women |
|---|---|---|---|---|---|---|---|---|---|
| Oslo/Akershus | 18-29 years | No education/elementary school | 2.7 | 2.4 | Western Norway | 18-29 years | No education/elementary school | 4.4 | 1.9 |
| | | Upper secondary education | 1.1 | 0.9 | | | Upper secondary education | 1.6 | 1.0 |
| | | University/university college | 1.6 | 1.0 | | | University/university college | 1.5 | 1.6 |
| | 30-59 years | No education/elementary school | 5.6 | 4.2 | | 30-59 years | No education/elementary school | 3.9 | 3.2 |
| | | Upper secondary education | 1.2 | 0.9 | | | Upper secondary education | 1.1 | 1.3 |
| | | University/university college | 0.7 | 0.6 | | | University/university college | 0.7 | 0.6 |
| | 60 and above | No education/elementary school | 0.8 | 1.3 | | 60 and above | No education/elementary school | 1.0 | 1.6 |
| | | Upper secondary education | 0.8 | 1.1 | | | Upper secondary education | 1.0 | 1.5 |
| | | University/university college | 0.3 | 0.3 | | | University/university college | 0.3 | 0.3 |
| Eastern Norway | 18-29 years | No education/elementary school | 5.5 | 3.1 | Trøndelag | 18-29 years | No education/elementary school | 2.7 | 2.3 |
| | | Upper secondary education | 1.6 | 1.0 | | | Upper secondary education | 1.2 | 1.1 |
| | | University/university college | 1.5 | 1.4 | | | University/university college | 1.2 | 2.3 |
| | 30-59 years | No education/elementary school | 4.1 | 4.5 | | 30-59 years | No education/elementary school | 2.7 | 4.1 |
| | | Upper secondary education | 1.3 | 1.2 | | | Upper secondary education | 1.0 | 1.1 |
| | | University/university college | 0.8 | 0.7 | | | University/university college | 0.6 | 0.6 |
| | 60 and above | No education/elementary school | 1.5 | 1.9 | | 60 and above | No education/elementary school | 0.9 | 2.3 |
| | | Upper secondary education | 0.9 | 1.9 | | | Upper secondary education | 1.1 | 1.6 |
| | | University/university college | 0.3 | 0.4 | | | University/university college | 0.3 | 0.3 |
| Southern Norway | 18-29 years | No education/elementary school | 3.4 | 5.5 | Northern Norway | 18-29 years | No education/elementary school | 3.5 | 1.9 |
| | | Upper secondary education | 1.6 | 1.3 | | | Upper secondary education | 1.6 | 1.0 |
| | | University/university college | 1.6 | 1.5 | | | University/university college | 2.5 | 2.6 |
| | 30-59 years | No education/elementary school | 2.9 | 3.0 | | 30-59 years | No education/elementary school | 3.4 | 3.4 |
| | | Upper secondary education | 1.2 | 0.9 | | | Upper secondary education | 1.2 | 1.1 |
| | | University/university college | 0.8 | 0.7 | | | University/university college | 0.7 | 1.0 |
| | 60 and above | No education/elementary school | 1.4 | 1.7 | | 60 and above | No education/elementary school | 1.5 | 2.7 |
| | | Upper secondary education | 1.7 | 2.7 | | | Upper secondary education | 1.2 | 1.2 |
| | | University/university college | 0.4 | 0.4 | | | University/university college | 0.3 | 0.4 |

## REPRESENTATIVITY MEMBERS RECRUITED IN EIGHT WAVE

**Table 11: Age distribution in the population and the members recruited in wave eight**

| | 18-29 years | 30-59 years | 60 years and above |
|---|---|---|---|
| Population | 20.5 % | 51.6 % | 28.0 % |
| Net sample - w08 | 17.4 % | 51.4 % | 31.4 % |

**Table 12: Combined distribution of age and gender in the population and the members recruited in wave eight**

| | 18-29 years | | 30-59 years | | 60 years and above | |
|---|---|---|---|---|---|---|
| | Men | Women | Men | Women | Men | Women |
| Population | 10.50 % | 10.00 % | 26.50 % | 25.10 % | 13.00 % | 14.90 % |
| Net sample - w08 | 7.6 % | 9.7 % | 24.8 % | 26.5 % | 16.6 % | 14.8 % |

**Table 13: Combined distribution of age, gender and education in the population and the members recruited in wave eight**

| | | Population | | Net sample - w08 | |
|---|---|---|---|---|---|
| | | Men | Women | Men | Women |
| No education/elementary school | 18-29 years | 4.1 % | 3.2 % | 1.9 % | 1.8 % |
| Upper secondary education | 18-29 years | 4.2 % | 3.4 % | 4.4 % | 4.0 % |
| University/university college | 18-29 years | 2.2 % | 3.4 % | 3.3 % | 1.8 % |
| No education/elementary school | 30-59 years | 5.5 % | 4.9 % | 1.4 % | 1.5 % |
| Upper secondary education | 30-59 years | 12.1 % | 8.8 % | 9.9 % | 12.0 % |
| University/university college | 30-59 years | 9.0 % | 11.4 % | 15.2 % | 11.9 % |
| No education/elementary school | 60 and above | 3.2 % | 4.9 % | 2.9 % | 2.6 % |
| Upper secondary education | 60 and above | 6.5 % | 7.1 % | 4.8 % | 6.4 % |
| University/university college | 60 and above | 3.3 % | 2.9 % | 6.6 % | 7.6 % |

Table 14: Combined distribution of age, gender and geography in the population and the members recruited in wave eight

| | | Population | | | Net sample - w08 | | |
|---|---|---|---|---|---|---|---|
| | | Men | Women | Total | Men | Women | Total |
| Akershus/Oslo | 18-29 years | 2.5 % | 2.6 % | 5.1 % | 2.9 % | 2.2 % | 5.1 % |
| | 30-59 years | 6.7 % | 6.4 % | 13.1 % | 7.7 % | 7.2 % | 14.9 % |
| | 60 and above | 2.6 % | 3.0 % | 5.6 % | 4.0 % | 4.4 % | 8.4 % |
| | In total | 11.8 % | 12.0 % | **23.8 %** | 14.6 % | 13.8 % | **28.4 %** |
| Eastern Norway | 18-29 years | 2.5 % | 2.3 % | 4.8 % | 2.0 % | 1.6 % | 3.6 % |
| | 30-59 years | 6.8 % | 6.6 % | 13.4 % | 6.1 % | 5.0 % | 11.1 % |
| | 60 and above | 3.9 % | 4.5 % | 8.4 % | 3.5 % | 4.3 % | 7.8 % |
| | In total | 13.2 % | 13.4 % | **26.6 %** | 11.6 % | 10.9 % | **22.5 %** |
| Southern Norway | 18-29 years | 0.6 % | 0.6 % | 1.2 % | 0.5 % | 0.4 % | 0.9 % |
| | 30-59 years | 1.5 % | 1.4 % | 2.9 % | 1.5 % | 1.4 % | 2.9 % |
| | 60 and above | 0.7 % | 0.9 % | 1.6 % | 0.8 % | 0.9 % | 1.7 % |
| | In total | 2.8 % | 2.9 % | **5.7 %** | 2.8 % | 2.7 % | **5.5 %** |
| Western Norway | 18-29 years | 2.8 % | 2.7 % | 5.5 % | 2.7 % | 1.9 % | 4.6 % |
| | 30-59 years | 6.9 % | 6.3 % | 13.2 % | 7.1 % | 6.7 % | 13.8 % |
| | 60 and above | 3.3 % | 3.7 % | 7.0 % | 3.8 % | 4.1 % | 7.9 % |
| | In total | 13.0 % | 12.7 % | **25.7 %** | 13.6 % | 12.7 % | **26.3 %** |
| Trøndelag | 18-29 years | 1.0 % | 0.9 % | 1.9 % | 0.7 % | 0.9 % | 1.6 % |
| | 30-59 years | 2.2 % | 2.1 % | 4.3 % | 2.1 % | 2.5 % | 4.6 % |
| | 60 and above | 1.2 % | 1.3 % | 2.5 % | 1.2 % | 1.5 % | 2.7 % |
| | In total | 4.4 % | 4.3 % | **8.7 %** | 4.0 % | 4.9 % | **8.9 %** |
| Northern Norway | 18-29 years | 1.0 % | 0.9 % | 1.9 % | 0.9 % | 0.6 % | 1.5 % |
| | 30-59 years | 2.4 % | 2.2 % | 4.6 % | 2.0 % | 2.1 % | 4.1 % |
| | 60 and above | 1.4 % | 1.5 % | 2.9 % | 1.5 % | 1.4 % | 2.9 % |
| | In total | 4.8 % | 4.6 % | **9.4 %** | 4.4 % | 4.1 % | **8.5 %** |