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The effect of nonresponse and measurement errors on turnout estimates

Experiences from using administrative linked data in the Norwegian General Election Survey 1969–2021

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Preface

It is well known from the survey methodology literature that estimates on electoral turnout from election surveys often shows a considerably higher share of voters compared to the official turnout. Statistics Norway started conducting election surveys in 1969 and has a long tradition of using administrative records linked to the survey elements to study and separate different non-sampling errors. Using the Norwegian Election Survey 1969-2021 we explore the possible effects of nonresponse and measurement errors on turnout estimates. The main findings in this analysis were presented in the session Advances in Survey Methodology at the 79th Annual Midwest Political Science Association (MPSA) Conference, Chicago USA, April 7-10, 2022.

Statistics Norway, 15 June 2022

Johan Åmberg

Abstract

Estimates on electoral turnout from election surveys often shows a considerably higher share of voters compared to the official turnout. A well-known phenomenon from survey methodology is 'social desirability bias': *people will try to represent themselves in a way that reflects well on them*. But this is not the only source of error that should be taken into consideration. Estimates are not equal to the true values because of variability (due to random effects) and bias (systematic effects). A survey will be exposed to both sampling errors and non-sampling errors. *Sampling errors* occur because only a subset of the population is selected. *Non-sampling errors*, like nonresponse and measurements errors, apply to all statistical processes. Nonresponse error is the difference between the statistics computed from the collected data and those that would be computed if there were no missing values. Measurement errors occur during data collection and cause the recorded values of variables to be different from the true ones. We use data from the Norwegian General Election Survey 1969–2021, with linked administrative records for the respondents on electoral turnout, population demographic characteristics and questions from the surveys. Data from administrative records enable us to study the direct effect of measurements errors and nonresponse errors.

Our results show that when we produce estimates on electoral turnout from surveys, the surveys will almost certainly show a higher percentage of voters when compared with official results. Both nonresponse bias and measurement bias (over-reporting) contribute to this. The two error sources pull in the same direction. Nonresponse bias is of much greater concern than measurement bias (over-reporting). Our analysis shows an agreement rate (survey*register) between 92 and 99 per cent from 1969 until 2021. On average, the agreement rate is 96 percent, which is high compared to other survey variables. Still, over-reporting always occurs; voters are more liable to over-report than under-report. We speculate that this has something to do with 'social desirability bias'. Although the overreporting is relatively low for the whole group of respondents, it is considerable higher for subgroups like young respondents with low education. The same subgroup that has a lower response rate and the largest nonresponse bias.

We also demonstrate that respondents who claim they have voted in the election but are not confirmed by the administrative register seem to be spread across parties. Respondents who answer that they have voted in the election in the survey, but will not reveal their party choice, are by and large confirmed to be voters by the register.

Contents

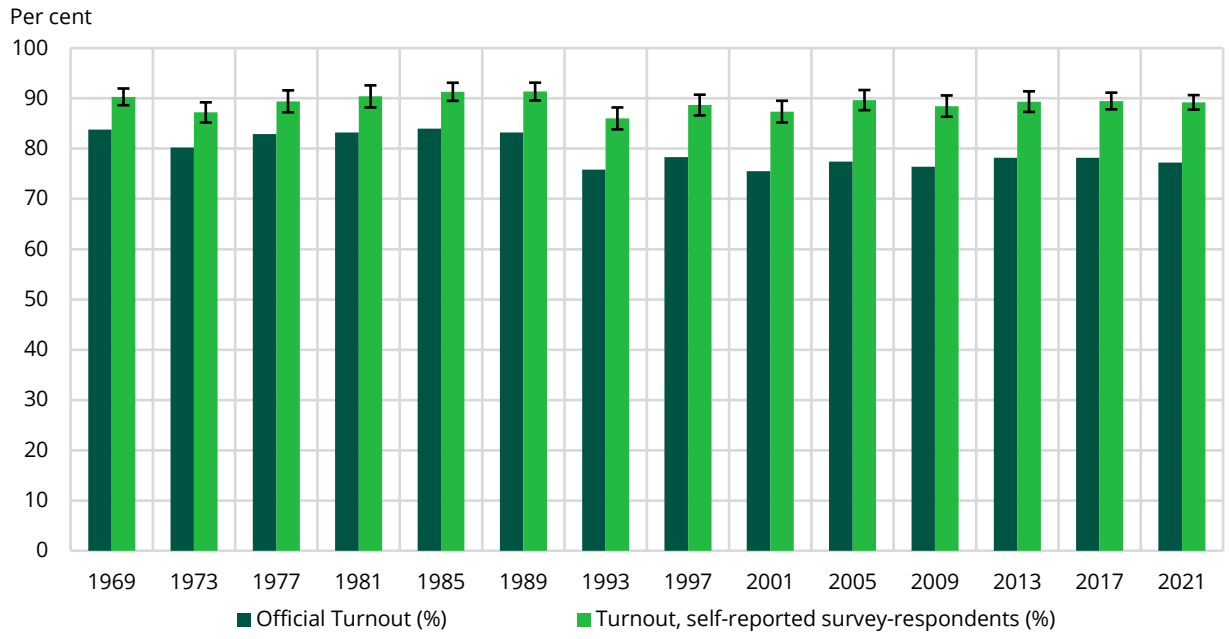
1. Introduction

The purpose of official statistics is to produce estimates of unknown values of quantifiable characteristics of a target population. Estimates are not equal to the true values because of variability (the statistics change from implementation to implementation of the statistical process due to random effects) and bias (the average of the possible values of statistics from implementation to implementation is not equal to the true value due to systematic effects; the bias of an estimator equals the difference between its expected value and the true value). It is common to distinguish between sampling errors and non-sampling errors:

- Sampling errors, which apply only to sample surveys. Occur because only a subset of the population is selected.
- Non-sampling errors, which apply to all statistical processes, are often categorised as coverage errors, nonresponse errors, processing errors and measurement errors. Coverage errors (or frame errors) are due to divergence between the frame population and the target population.

Figure 1.1 shows the official turnout in the general elections in Norway since 1969. Furthermore, it shows the percentage who stated that they voted among those who responded in the Norwegian General Election Surveys (NO-GES) from 1969 until 2021.

Figure 1.1 Turnout according to self-reporting among respondents in The General Election Survey and Official Turnout Figures in the General Elections. 1969-2021. Per cent



Error bars: 95 % confidence interval (including 1.5 Design effect 1969-2017)
Q: 'Did you vote in the general election held in the autumn?' (2021)
Source: Election Statistics and General Election Survey. Statistics Norway. See The data basis for the figures. Figure data 1.1

There will be errors!

The percentage who stated that they voted in the survey is higher than the percentage of actual voters for all election years. 1981 shows the lowest difference between the actual turnout rate and the turnout rate in the survey (6 percentage points higher) 2017 shows the highest difference (15 percentage points). The estimate from the surveys is significantly higher compared to the official election result every year. What causes this?

2. Theories of error sources in statistics

2.1. Total survey error framework

Classic survey methodology textbooks distinguish between sampling errors and non-sampling errors (Deming 1950; Hansen, Hurwitz and Madow 1953). Sampling errors arise because only a subset of the population is selected. Non-sampling errors are due to mistakes and/or system deficiencies and include all errors that can be made during data collection and data processing. All sources of non-sampling errors may produce random as well as systematic errors. Systematic errors lead to biased estimates, whereas random errors affect the variance of estimators.

A systematic and comprehensive approach to potential error sources in data from sample surveys is the so-called total survey error framework (e.g., Groves 1989, Biemer and Lyberg 2003, Groves et al. 2009), which starts at conception, moves to collection and processing and then to the statistics produced. The point of departure is that sample surveys rely on two types of inference (Groves et al. 2009): (1) from a response to a construct and (2) from sample statistics to population statistics. The inference process involves two coordinated sets of steps, namely obtaining answers to questions constructed to mirror the constructs and identifying and measuring sample units that form a microcosm of the target population. In Table 2.1, the two sources of error, the measurement process and representation process, are detailed.

Table 2.1Life cycle of statistics from microdata and total error framework

Stage	Measurement	*Error Source*	Representation (units)	*Error Source*
	Construct		Target population	
Conception	\/	*Validity*	\/	*Coverage error*
	Measurement		Sampling frame	
	\/	*Measurement error*	\/	*Sampling error*
Collection	Response		Sample	
			\/	
	\/			*Nonresponse error*
			Respondents	
		Processing error	\/	*Adjustment error*
Processing	Edited response		Postsurvey adjustments	
	\/		\/	
	→	*Statistics produced*	←	

Source: Adapted from Groves et al. 2009.

The measurement should ideally be designed to perfectly reflect the constructs we are trying to measure. When the measuring instrument is used, there will be a 'response'. There are a variety of means by which responses can be produced, including from memory or by accessing records to report. The responses are collected and stored, and then they will often undergo some form of editing where we look for inconsistency, etc.

The error sources are listed in italics next to the key elements. Starting with measurement, the first step is to transform the abstract construct into a questionnaire or a description of how to measure a phenomenon. By convention, we do not use the word 'error' to describe the mismatches between a construct and its associated measurement. Validity is the extent to which the measures reflect the underlying construct. Measurement error is the mismatch of the true value of the measurement as applied to the sample unit and the value provided. Measurement errors occur during data collection and cause the recorded values of variables to be different from the true values. Between data collection and the beginning of statistical analysis, data must undergo processing that comprises data entry, data editing, often coding and imputation. Errors introduced in these stages are called processing errors.

The right column of Table 2.1 concerns the representational process. In the General Election Survey, the target population is all Norwegians eligible to vote in the Storting election (Stortinget is the name of the Norwegian Parliament). Individuals listed in the electoral register have the right to vote in the parliamentary election. To be listed, one must be a Norwegian citizen; reach the age of 18 by the end of the election year; and be, or have been, registered in the Population Register as resident in Norway. A sampling frame is a listing of all units in the target population. In our case, this list is the electoral register, to which Statistics Norway has access. Coverage errors (or frame errors) are due to divergence between the frame population and the target population. A sample is then selected from the sampling frame. Sampling error is deliberately introduced into sample survey statistics. Normally, because of cost constraints, only a small share of the units in the sampling frame are measured. This deliberate 'error' introduces deviation in the estimates from the sample compared to statistics produced based on the complete sampling frame.

There is an important distinction between sampling bias and sampling variance. Sampling bias arises when some members of the sampling frame are given no chance (or a reduced chance) of selection. Sampling variance arises because many different sets of samples can be drawn from a sampling frame. In almost all measurements in surveys or censuses, there are missing data or nonresponses. Nonresponse error is the difference between statistics based on the respondents and the statistics that would be obtained if all respondents in the sample had been measured. Information from the respondents is used to create a 'raw' microdata set. To improve the quality of the estimates, we normally make some adjustments to the 'raw' dataset. Because of nonresponses and/or mismatches between the sample frame and the target population, either we reweigh the respondents or missing data are replaced with predicted responses through imputation. The last error source, adjustment error, arises in the construction of statistical estimators to describe the full target population. Postsurvey adjustments involve efforts to improve the sample estimate in the face of coverage, sampling, and nonresponse errors, but they can also increase errors in some situations.

The sum of all the errors is total survey error (TSE). This is merely the difference between the estimate from the survey and the true value in the population. Total survey error can rarely be reduced to a quantifiable number. Quantifying all the errors in the model is normally very difficult. But in this example, the TSE of the turnout estimates from the NO-GES is close to the difference between the official turnout and the estimate from the NO-GES. But in real life, results from registers also have errors attached to them. In most cases, the total error framework is a structural methodological approach for assessing and describing the different error sources.

2.2. Expanding the total error framework to include registers

Statisticians within national statistical institutes have long argued that administrative registers do not provide perfect statistical data (e.g., Hoffmann 1995). Bakker (2011) argues that the same 'error model' used for sample surveys (TSE) can be adapted to register data, noting that '*it is likely that errors that normally emerge in surveys will also occur in registers*'. Zhang (2012) expands this idea to include a 'two-phase life-cycle model of integrated statistical microdata'. The use of administrative data for statistical or research purposes is "second nature" in contrast to sample survey data which are designed and collected for certain research purposes. Administrative data are owned and maintained by external register owners. They have already gone through a sequence of conception, collection and processing before they are delivered to the statistical agency, and importantly, they are collected for administrative purposes (not statistical purposes). Hence, they are almost never fit for statistical purposes right away but must undergo a process in the statistical office. Using an administrative register for statistical purposes is often only possible after it has been combined with data from other sources. Since 2019, Statistics Norway owns and maintains an administrative

register which contains information about who participated in elections, including all persons eligible to vote in the elections. This register is put together by different sources.

2.3. A register-based statistical system is suitable to separate different error sources

The National Population Register (NPR) in Norway was established in 1964 based on the 1960 census. The census in 1970 was used to check and update the NPR and establish a register of education. The core of the NPR is a universal and unique personal identifier (personal number), given to every resident at birth or upon entering the country for residence. For some decades, administrative registers have been an important data source for official statistics in Norway. Administrative registers also provide frames and valuable auxiliary information for sample surveys. Statistics Norway, like other Nordic national statistical institutes, has made systematic efforts to combine data and integrate various administrative data for statistical purposes (Nordbotten 2010; UNECE 2007).

Statistics Norway produces electoral turnout by social background from register information.

The Norwegian Statistics Act states that Statistics Norway shall have access to all registers in Norway. The Representation of the People Act states that local election committees must provide information Statistics Norway considers necessary to produce the official election statistics.

Since the 1960s, Statistics Norway has developed a system to monitor the electoral participation by social background by using national ID numbers to link microdata from the electoral registers with microdata from other registers. Until 2009, the sample for the General Election Survey (NO-GES) was used for this purpose. A statistical form including the sample was sent to the local election committees by Statistics Norway. The committees were asked to report whether the individuals had voted or not and return the form to Statistics Norway. In 2013 and 2017, several municipalities reported this information through an electronic system containing all persons, and Statistics Norway used a large stratified sample in other municipalities. Since 2021, the register contains all persons in the electoral roll.

Norway has a rule of 'passive' voter registration, voters don't need to 'register to vote' as they are automatically included on the electoral roll. All prospective voters must be included with their full name, address and their national ID number in the 'electoral register' – a list of all those who are entitled to vote in a municipality. The basis for the electoral register is the National Population Register. The Norwegian Statistics Act states that Statistics Norway shall have access to all registers in Norway. In addition, the Election Act states that the local election committees must provide information Statistics Norway considers necessary to produce the official election statistics. Individual data from the electoral register is linked with other registers Statistics Norway has access to. Today a substantial part of official statistics in Norway are either directly produced from the register system or otherwise benefit from it. Official statistics on electoral turnout by background variables like gender, age and level of education are mainly estimated by Statistics Norway based on register data provided to Statistics Norway from the government institution responsible for the election (The Norwegian Directorate of Elections).

When Statistics Norway performed its first General Election Survey in 1969, the national ID number was in place, so when the sample for the survey was drawn it was drawn directly from the population register and checked against the electoral roll. Right from the start the gross sample was sent to the local election committees in the municipalities, which checked if each person in the sample had voted in the election. Each local election committee needs to have a register of each person entitled to vote in the municipality and electoral law states that they must cross off all voters on the list who have voted (to avoid one person voting several times). The local election committee sends back the list to Statistics Norway, which can then transform that information into a variable in

the dataset from the survey. In the latest elections, this has all been done electronically in most municipalities in an electronic administrative election system.

Administrative register data provide the richest source of auxiliary information in addition to data collected in previous surveys and censuses. Moreover, the extensive use of administrative registers has substantially influenced the development of statistical methodology (Zhang 2012). A register-based statistical system is suitable to study the different error sources in survey statistics, as different errors can be separated (Zhang, Thomsen and Kleven 2013). For example, the effect of nonresponse error on turnout can be estimated in a straightforward manner from the register as the difference between the gross sample (including non-eligible individuals) and the respondents (net sample). In a previous analysis of the NO-GES, we demonstrated that there is a selection effect leading to nonresponse bias towards respondents who vote in the election. Voters tend to be more willing to participate in the survey compared to non-voters (Zhang, Thomsen and Kleven 2013). Our previous research also shows that in addition to the selection effect, there is a measurement error leading to over-reporting. Register data based on administrative records is often seen as a 'gold standard', but register data are also affected by sources of errors and cannot be regarded as a true criterion for the survey estimates. As already elaborated, administrative registers do not provide perfect statistical data. However, the effect and the structure of the measurement error can be estimated by comparing the values reported in the surveys and the values in the register.

2.4. Assessment of different data sources for turnout

The measurement process in the NO-GES from about 1969 until 1993 consisted of face-to-face interviews based on a random sample. The use of telephone interviews increased from 1997, and in 2017 and 2021 a web survey was also introduced. The survey protocol has not been identical over the years, but the sampling frame and the sampling are rather straightforward a two-stage standardised sampling frame was used until 2013 with a probability sample. Since 2017, we have used simple random sampling. The number and order of questions on the questionnaires are not identical. Hence mode effects and order effects may vary over time. The construction of the administrative register has also changed slightly over the years. Until 2013, a paper list of the sampled individuals (elements) in the survey (regardless of response or nonresponse) with their unique national identification number was sent to the local election committees in the municipalities who were asked to return the list after ticking off whether each individual had voted or not. Both the Statistics Act and the Election Act require local election committees to complete and return the lists to Statistics Norway. Since 2013, a large proportion of the municipalities have delivered this information electronically thorough data collected by the electoral management body in Norway (Norwegian Directorate of Elections). According to the Statistics Act, the Norwegian Directorate of Elections is obliged to share its administrative registers with Statistics Norway. Some municipalities (although fewer and fewer) do not deliver this information through the electronic electoral management system. These municipalities deliver the full paper list to Statistics Norway. Register data based on administrative records is often seen as a 'gold standard', but register data are also affected by sources of errors and cannot straightforward be regarded as a true criterion for the value reported by respondents in the survey. As already elaborated, administrative registers do not provide perfect statistical data. The possible outcome for turnout in any given election when we consider two sources of information is displayed in table 2.2. There are four possible outcomes: in y_2 and y_4 there is a mismatch between the two sources, while y_1 and y_3 show agreement.

Table 2.2 The possible outcome for each respondent when combining two sources with linked individual data for electoral turnout

		Did not vote according to register	Voted according to register
Did you vote in the last election this fall?	No	*y1*	*y2*
	Yes	*y4*	*y3*

But we don't have 100 per cent certain knowledge of the status in each case. In theory, the values in the survey and the register for everyone in our sample could fall within any combination of true and false (see table 2.3).

Table 2.3 The theoretically true or false status of the outcome in table 2.2

	Register value is false	Register value is true
Survey response is false	*y1 , y2 , y3 , y4*	*y1 , y2 , y3 , y4*
Survey response is true	*y1 , y2 , y3 , y4*	*y1 , y2 , y3 , y4*

Before we make any inferences from table 2.2, however, we need to consider the possible errors in the different data sources and the possible magnitude of these errors. Table 2.4 shows an assessment of the different error sources in the three different data sources: sample surveys, paper administrative records from and electronic administrative records. The coverage error will be low for all data sources. Sample survey will have a sampling error (before 2013 the same sample was used to produce estimates from administrative sources). There can be missing data in all three sources, but this error source will be of far more importance in the sample survey. A survey can be more up to date than a register based on administrative records, although time delay in registers today is a much smaller problem today than during the predigital era.

In Table 2.4, different errors that can occur during the measurement process are listed. Measurement errors can be systematic or random and are commonly attributed to the following three causes:

- the instrument, the questionnaire or measuring device used for data collection may lead to the wrong values being recorded;
- respondents may, consciously or unconsciously, give erroneous data;
- interviewers may influence the answers given by respondents.

The instrument in surveys is a questionnaire. In administrative records, the instrument is a form or a description of meta data. The instrument can have an impact on the quality of the input of the data for surveys and administrative registers. Only surveys have respondents; hence, errors caused by respondents are relevant for surveys but not for data from administrative records. A response to a survey question involves a cognitive process, including the comprehension of the question, the retrieval of relevant information, the use of that information to make required judgements and the selection and reporting of an answer (Tourangeau et al. 2000). Studies have shown that there are many pitfalls related to obtaining an accurate response to a question. Groves et al. (2009) identifies seven respondent-related problems that may lead to measurement errors in a survey:

- failure to encode the information sought,
- misinterpretation of the questions,
- forgetting and other memory problems,
- flawed judgement or estimation problems,
- problems in formatting an answer,
- deliberate misreporting,
- failure to follow instructions.

All seven problems are highly relevant for surveys but are less important in administrative records. However, administrative records are not untouched by human hands; in the predigital era, these records relied heavily on the accuracy of office staff, but today there are considerably fewer problems related to reporting accurately. Having an interviewer present can be both an advantage and a disadvantage. Interviewers may help respondents choose the right answer. On the other hand, an interviewer may lead respondents to give erroneous answers, merely by their presence.

Data processing errors can be present in all three data sources. Generally, processing errors can be both systematic and random. Keying errors can occur, but this type of error is normally random and has little impact.

Table 2.4 An assessment of error sources in the measurement of turnout in surveys and administrative sources

		Turnout from administrative sources	
Error source	Turnout from the General Election Survey	Paper list	Electronic register from the Electoral Management Body
Coverage error	Persons over 80 omitted	No	Relevant
Sampling error	Present but variable (sampling variance)	Can be[1] relevant	Can be[1] relevant
Missing data (nonresponse)	Yes, both systematic and variable	Relevant but very low	Relevant but very low
Time lag (update)	Low	Low	No
Validity issues (specification error)	No	No	No
Measurement error	Yes, both systematic and variable	Relevant but very low	Relevant but very low
• Questionnaire or measuring device	Relevant	Relevant but very low'	Relevant but very low
• Failure to encode the information sought	Relevant	Relevant but very low'	Relevant but very low
• Misinterpretation of the questions	Relevant	No	No
• Forgetting and other memory problems	Relevant	No	No
• Flawed judgement or estimation problems	Relevant	No	No
• Problems in formatting an answer	Relevant	No	No
• Deliberate misreporting	Relevant	No	No
• Failure to follow instructions	Relevant	Relevant but very low	Relevant but very low
• Interviewer influence	Relevant	No	No
Data processing error			
• Keying error	Present but variable	Present but variable	Present but variable

1: Not relevant if the register is complete but is the same as sample survey if only sample is used.

Considering table 2.4, there are a lot more error sources in the sample survey than in the register from administrative data. The register may contain some errors, but they are probably small and not systematic (e.g. an election official can in some instances 'forget' to tick off some voters). Before the register is used in Statistics Norway a quality assurance process is performed. Mysterious or strange values are checked, and in some cases the lists are sent back to the local election committee. We believe the effects and the structures of measurement error can be estimated by comparing the values reported in the surveys and the values in the register.

Social desirability bias

A well-known phenomenon from survey methodology is 'social desirability bias': *people will try to represent themselves in a way that reflects well on them.* Social desirability bias is a significant problem in survey research if the questions deal with socially desirable or undesirable behaviour or attitudes (Bradburn et al. 2004). But this bias can also affect responses to factual questions such as educational attainment (Kleven and Ringdal 2020). Survey methodology textbooks address how to ask questions about attitudes and behaviour. The social desirability bias is expected to be greater with an interviewer present than when using self-completion questionnaires. All interviewers, however, receive basic training which includes learning how to ask "threatening questions" about behaviour and attitudes.

3. Data and methods

3.1. Archive studies

This study spans more than 50 years. The survey division at Statistics Norway keeps an archive of all previous surveys. The archive contains key documents, meeting minutes, etc. Considerable time and effort were spent on finding and reading archival material and documentation from previous years. The author has been involved in one form or another since 1997. Also, conversations or unstructured interviews with professionals inside Statistics Norway and researchers at the Institute for Social Research who worked with the survey has been of great help.

3.2. Sampling

Frame

The sample is a probability sample consisting of persons. The population frame for the surveys is all people allowed to vote in Norwegian general elections. Between 1969 and 1977 this included all Norwegian citizens 20 years or older. From 1981, this was expanded to include Norwegian citizens who become 18 in the election year (or older). The sampling frame of the survey was the National Population Register for the years from 1969 until 2013. Since 2017, it is the electoral roll.

Two-stage sampling frame, 1969–2013

For the years 1969–2013, the sample is drawn according to the current standardised two-stage sampling frame used for personal interviewing in Statistics Norway. The use of a two-stage or a multistage sampling frame can substantially reduce costs in an interviewer-administered face-to-face survey. Although details have changed over the years due to demographic changes and administrative changes in the fieldwork organisation, the sampling frame has in its essence stayed the same.

In Statistics Norway's old sampling frame, the entire country was divided into a set of sample areas, namely municipalities. Municipalities with small populations were combined with other municipalities so that all sample areas had at least 7 per cent of the total population of the stratum to which the area belongs. In several cases, smaller neighbouring municipalities of populous municipalities were combined with the large municipality into one area. All municipalities with more than 30,000 inhabitants and several municipalities with between 25,000 and 30,000 inhabitants were set aside as separate strata. The other sample areas were stratified in each county by industrial structure, population density, centrality, commuting and shopping patterns, media coverage and communications. The sample areas were grouped into 109 strata. The first step is to draw a sample area from each stratum. Sample areas that are separate strata were drawn with 100 per cent probability. The remaining areas were drawn with a probability proportional to the number of inhabitants in the sample area. In the second step, the sample of persons was drawn randomly from the 109 sample areas. The drawing at the second step was done so that the sample is self-weighting when both steps are taken into consideration. As a rule of thumb, Statistics Norway recommends considering a design effect resulting from the sampling frame at 1.5. However, the design effect depends on the variables being examined, and empirical tests of the design effect in Statistics Norway's sampling frame show the design effect to be considerably lower than 50 per cent, if anything between 10 and 20 per cent.

Since 2017 the data collection design has been changed to use primarily telephone and web surveys. There is no great cost reduction from using a two-stage sampling plan anymore, so the new sample has been drawn as a simple random sample.

Rotating panel

Since 1981 the sample has been divided into two: about half the sample is part of the sample in the previous round; the other part is new in each round and will be part of the next round. Note that this refers to the actual sample drawn regardless of response or nonresponse. To give the sample cross-sectional proportions, a proportional 'new' sample of young people and immigrants are added to the panel from the previous round. If a person moves out of the municipality where he or she was originally sampled, the interviewers are instructed to follow the person and do the interview in the new municipality.

Cut off and non-eligible

Persons over 79 were not surveyed. Persons living abroad or residents in institutions like nursing homes were categorised as non-eligible. Up to the end of 1990s, time-lag in the register also included some individuals who died before the election (not a huge group). In the electronic age, this is a much smaller problem.

Table 3.1 Sample design in The General Election Survey 1969-2021

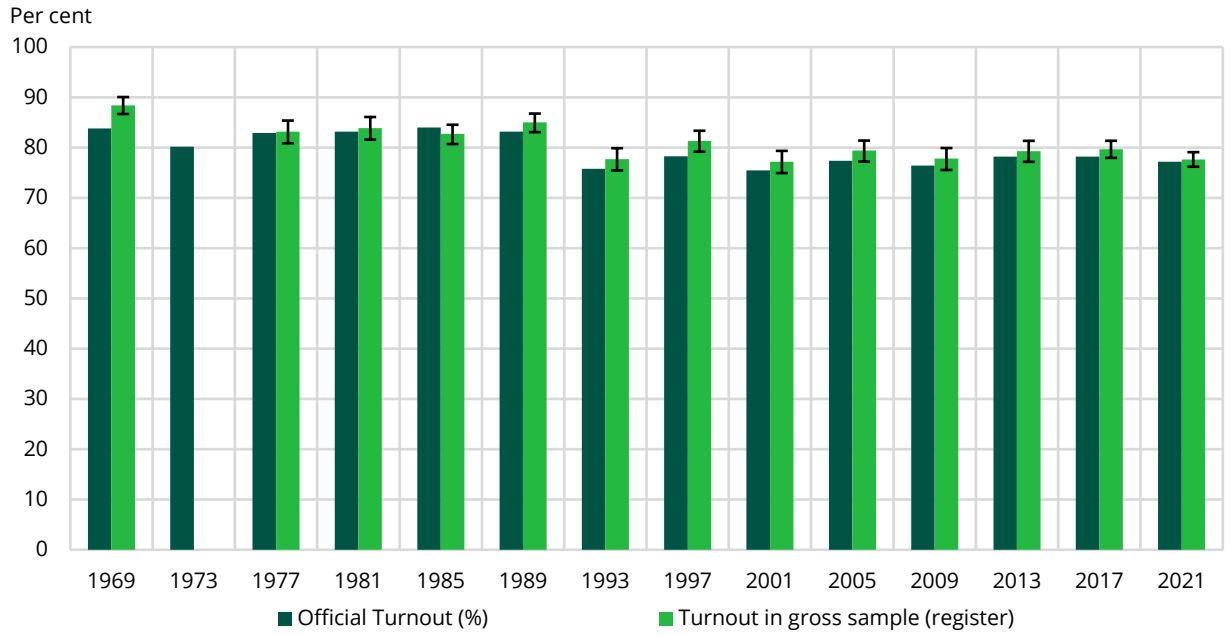
Year	Frame	Sample	Gross sample	Net Sample 1	Net Sample 1+2	Age	1 or 2-Stage	Panel/CS
1969	NPR	3 000	2 999	2 567	2 734	20-79	2-stage	Cross-sectional
1973	NPR	2 959	2 959	2 389		20-79	2-stage	Rotating panel from the EEC survey
1977	NPR	2 207	2 207	1 730	.	20-79	2-stage	Cross-sectional
1981	NPR	2 203	2 203	1 596	.	18-79	2-stage	Rotating panel
1985	NPR	3 000	2 967	2 180	.	18-79	2-stage	Rotating panel
1989	NPR	3 000	2 977	2 165	.	18-79	2-stage	Rotating panel
1993	NPR	3 000	2 983	2 194	.	18-79	2-stage	Rotating panel
1997	NPR	3 000	2 958	2 055	.	18-79	2-stage	Rotating panel
2001	NPR	3 000	2 950	2 052	.	18-79	2-stage	Rotating panel
2005	NPR	3 000	2 965	2 012	.	18-79	2-stage	Rotating panel
2009	NPR	3 000	2 944	1 770	1 968	18-79	2-stage	Rotating panel
2013	NPR	3 200	3 140	1 726	1 953	18-79	2-stage	Rotating panel
2017	Electoral Roll	3 200	3 180	1 966	2 053	18-79	Panel 2013, 2-stage New sample, Epsem	Rotating panel
2021	Electoral Roll	3 200	3 194	1 640	1 769	18-79	Epsem	Rotating panel

NPR: National Population Register
Net sample1: Ordinary collection, Net sample2: Follow-up by self-completion (post, web).
Epsem: Equal probability sample

Coverage error and sampling frame error

Sampling procedures have improved over the years. The fieldwork procedure excludes respondents living abroad and residents living in institutions such as care homes. Citizens over 79 years old are also excluded. The 1969 survey was one of the first surveys conducted by Statistics Norway. The experiences from that survey and other surveys in the beginning of the 1970s led to great improvements in sampling procedure and emphasized the possible effect of bias introduced by nonresponse. The sample from 1969 is biased as it contains an excessive proportion of voters. Except for 1985, all samples are slightly biased towards voters. One explanation is that the sample is a rotating panel which leads to a slight 'conditioning' (this cannot, however, explain the whole difference). But as we can see, the samples fall within a 95% confidence interval. But it is evidently clear that both the sampling procedure (cut-off) and fieldwork procedure tend to push the gross sample to include 'too many voters', making the sample biased compared to the population parameter. The sampled elements excluded in the sampling procedure (coverage error or frame error) are people who have a lower probability of voting. The registers Statistics Norway uses in the sampling procedure have improved greatly over the years. Today, missing data, time lag, and other issues are a much smaller problem compared to 20–40 years ago.

Figure 3.1 Official turnout and turnout in gross sample. The General Election Survey (NO-GES). 1969-2021. Per cent



Including follow-up survey. 1973 register check not performed.
Error bars: 95% confidence interval (Design effect: 1.5, 1969-2013)
Source: Election Statistics and General Election Survey. Statistics Norway. See The data basis for the figures. Figure data 3.1

3.3. Data collection

When they started in 1969, the election surveys were administered by local interviewers who recorded responses using pen and paper. If respondents did not want to answer questions about voting and which party they voted for, they could fill in a paper form and send it to Statistics Norway. Also, some interviews were done by telephone and not face-to-face. What would later be known as a *multimode fieldwork strategy* was used from the beginning in the election surveys. The documentation for these surveys seldom lists how many interviews were conducted face-to-face and by telephone. It is stated that majority of the interviews were done face-to-face and the telephone was mainly used if a sampled person had moved out of the original municipality. In 1995 Statistics Norway introduced computer-assisted interviewing, and since 1997 all the interviews have been done electronically. In 2001, the whole sample was contacted for an interview prior to the election to study the effect of the election campaign. In 2017, computer-assisted web interviewing was introduced.

The length of the survey interview in 1969 and 1973 was only 20 minutes. In 1977, the survey become part of a cooperation between the Norwegian Electoral Research Programme at the Institute for Social Research and Statistics Norway. The interview length was then greatly extended. From 1981 to 2013, the average interview length was about one hour. In 2017, the design of the survey was changed and CAWI was introduced; to lower the response burden, the questionnaire was shortened to an average of 40 minutes.

Table 3.2 Data collection design in The General Election Survey 1969-2021

Year	Interview mode	Interview length	Field-work	Other innformation
1969	F2f (95%), Self-completion (5%), Some telephone	20 min.	2 weeks	Some substitutions
1973	F2f (805) Postal self-completion (20%)	20 min.	3 weeks	
1977	Face-to-face 100%	80 min.	7 weeks	Questionnaire length increased, due to cooporation with NEP/ISR
1981	Face-to-face (97%) Telephone (3%)	60 min.	7 weeks	
1985	Face-to-face (83%) Telephone (17%)	60 min.	5 weeks	
1989	Face-to-face (75%) Telephone (25%)	60 min.	5 weeks	
1993	Face-to-face (72%) Telephone (28%)	60 min.	7 weeks	
1997	Face-to-face (68%) Telephone (32%)	60 min.	12 weeks	Computer-assisted interviewing introduced
2001	Face-to-face (53%) Telephone (47%)	60 min.	21 weeks	Sample surveyed both before and after the election
2005	Face-to-face (63%) Telephone (37%)	60 min.	17 weeks	
2009	Face-to-face (60%) Telephone (40%)	60 min.	20 weeks	Follow-up survey short form (paper)
2013	Face-to-face (55 %) Telephone (45%)	60 min.	18 weeks	Follow-up survey short form (paper)
2017	Telephone (61%) WEB (38%) Face-to-face (1%)	40 min.	16 weeks	Splitting and reducing questionnaire length Follow-up survey short form (web)
2021	Telephone (45%) WEB (54%) Face-to-face (1%)	40 min.	9 weeks	Follow-up survey short form (web)

NEP/ISR: Norwegian Electoral Research Programme/Institute for Social Research.

Every sampled person receives a notification letter explaining the purpose of the survey and informing them that an interviewer will try to get in contact for an interview. The surveys start the day after the election. In Norway, elections are held at predetermined intervals every fourth year. Neither the Prime Minister, the President of the Storting, the King etc. cannot call new elections. Elections are held around September 9, specifically on the Sunday and Monday closest to this date. Re-contact is used extensively for 'not-at-homes' and soft refusers.

The first election survey in Norway was done in 1949 by the FAKTA Bureau for Market Opinion Research. The survey was a part of a larger study of the problems of economic planning in post-war Norway, the 'Planning Project', carried out at the University of Oslo. Paul F. Lazarsfeld and Allan H. Barton from Columbia University, USA, participated in the Planning Project as instructors and trainers in social research. The results from the survey were a part of Barton's dissertation at Columbia University.

In 1957, the Norwegian programme of electoral research was set up by Stein Rokkan and Henry Valen at the Institute for Social Research. Statistics Norway helped create the sampling plan. Election surveys were carried out in 1957, 1965 and 1969 by the Norwegian Gallup organisation.

In 1966, a regular division and permanent interviewer corps was established in Statistics Norway. The first election survey conducted by Statistics Norway was in 1969. There were negotiations between the electoral programme and Statistics Norway to collaborate with respect to a survey regarding the upcoming 1969 election. It was not possible to reach an agreement until the 1977 election. Since 1977 the survey and fieldwork for the Norwegian electoral research programme has been a collaboration between Statistics Norway and the Institute for Social Research. The results and analysis in this document are solely about the surveys collected and published by Statistics Norway.

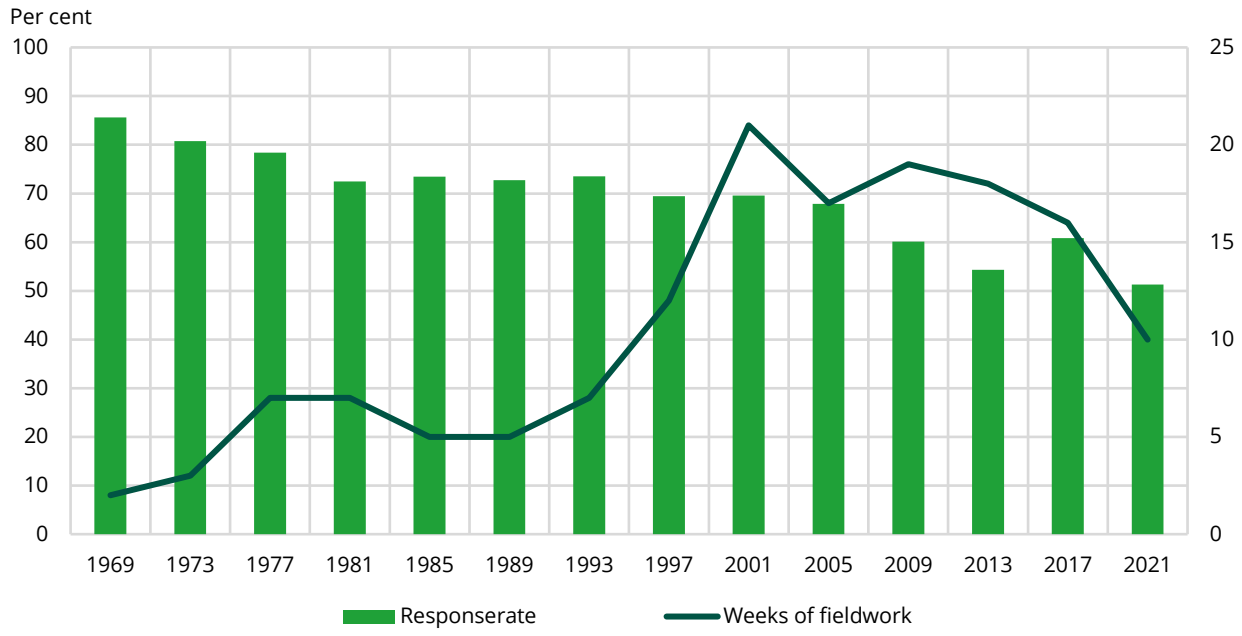
Increased efforts to maintain 'acceptable' response rates

Response rates have decreased steadily in household surveys across many countries, despite the increasing effort and resources being spent to deal with the problem. The associated nonresponse errors have received considerable attention in recent decades as they can cause bias and are critical to the accuracy of survey-based statistics. In Norway, response rates have decreased from an average of 80 per cent in the 1970s to 50–60 per cent in the last few years. Keeping the response rate above 50 per is challenging and requires increased resources. Several handbooks and articles addressing this problem have been published by practitioners and researchers within Statistics Norway (e.g. Thomsen et al. 2006, Zhang et al. 2013). They have recommended allocating more time

and resources to investigate the possible effect of nonresponse error, taking into consideration the connection between nonresponse error and other error sources. However, it is not possible to reach anything near a 100 per cent response, even if more resources are spent, and this will delay the publication of statistics and may introduce other errors into the survey estimates.

Over the years, as the response rate in the election survey has decreased, we see that more resources have been put into fieldwork. As an example, we show the development in the response rate and the development in fieldwork weeks. Until 1993, a 7-week fieldwork period was enough to reach a response rate of over 70 per cent. In 2001, we needed 21 weeks to reach the same response rate. The number of call backs to minimize non-contacts has increased, as has the use of different strategies to try to persuade individuals reluctant to respond. The unit cost per interviewee has increased dramatically over the years. The whole survey design for the election survey was changed in 2017, moving from one expensive big survey to a survey system with a different design relying more heavily on self-completion. The 'traditional' survey questionnaire was split and reduced, and web-based self-completion was introduced. One of the surveys is about 40 minutes long and closely resembles the 'traditional' survey and is a very important part of the Norwegian Electoral Programme.

Figure 3.2 The General Election Survey 1969-2021. Response rate (personal interview) in per cent and weeks of fieldwork



Not included 'follow-up short form' by mail or web.
Source: The General Election Survey. Statistics Norway. See The data basis for the figures. Figure data 3.2

3.4. Merging survey data and register data by a unique identifier

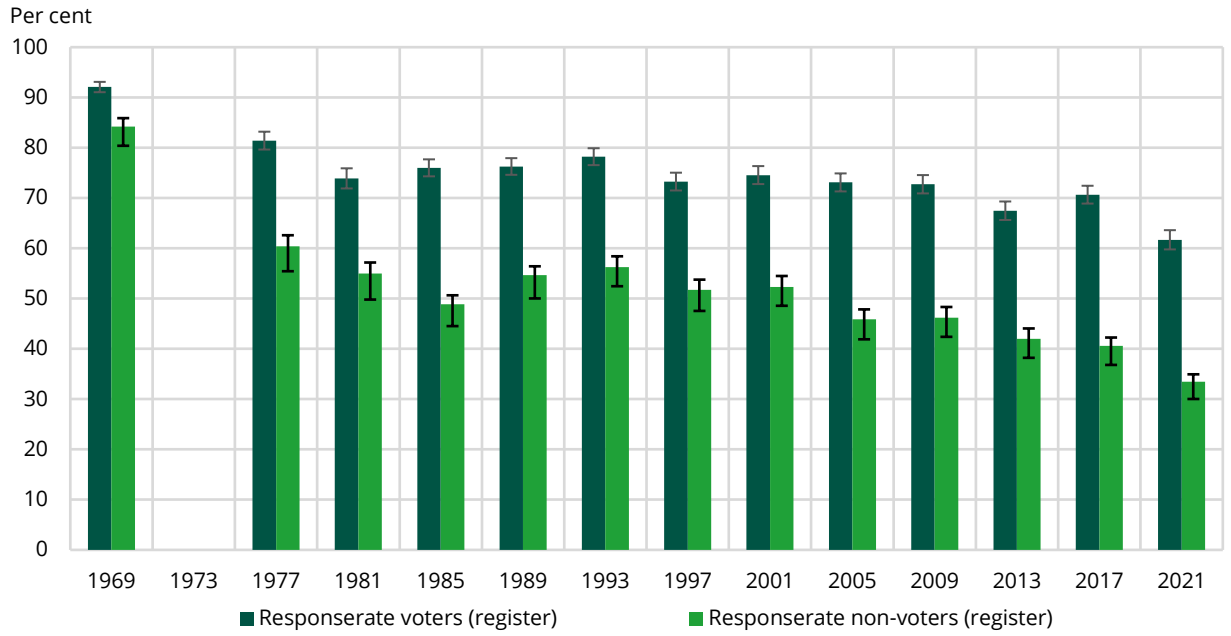
Every person living in Norway has a unique identifier, a national ID number. All prospective voters must be included on the electoral roll with their full name, address and their national ID number. The Norwegian Statistics Act states that Statistics Norway shall have access to all registers in Norway. Since 2013, Statistics Norway's register-based statistical system includes a register on turnout. From 1969-2009, the sample was sent to the local election committees in the municipalities, which checked if each person in the sample had voted in the election. The local election committees have a copy of the electoral roll and register who votes. These committees then send back the list to Statistics Norway, which can transform that information into a variable in the data set from the survey. For further details see 2.3–2.4.

4. Results

4.1. Nonresponse error

A register-based statistical system is suitable to study the different error sources in survey statistics, as different errors can be separated. For example, the effect of nonresponse error on turnout can be estimated in a straightforward manner from the register as the difference between the gross sample (sample minus non-eligible individuals) and the respondents (net sample). In a previous analysis of the NO-GES, we demonstrated that there is a selection effect leading to nonresponse bias towards respondents who vote in the election. Voters tend to be more willing to participate in the election surveys compared to non-voters (e.g. Thomsen 1971; Kleven and Normann 2002; Zhang et al. 2013). In figure 4.1, the response rates among voters and non-voters from 13 general election surveys are displayed.

Figure 4.1 Response rate among voters and non-voters according to register. The General Election Survey (NO-GES). 1969-2021. Per cent



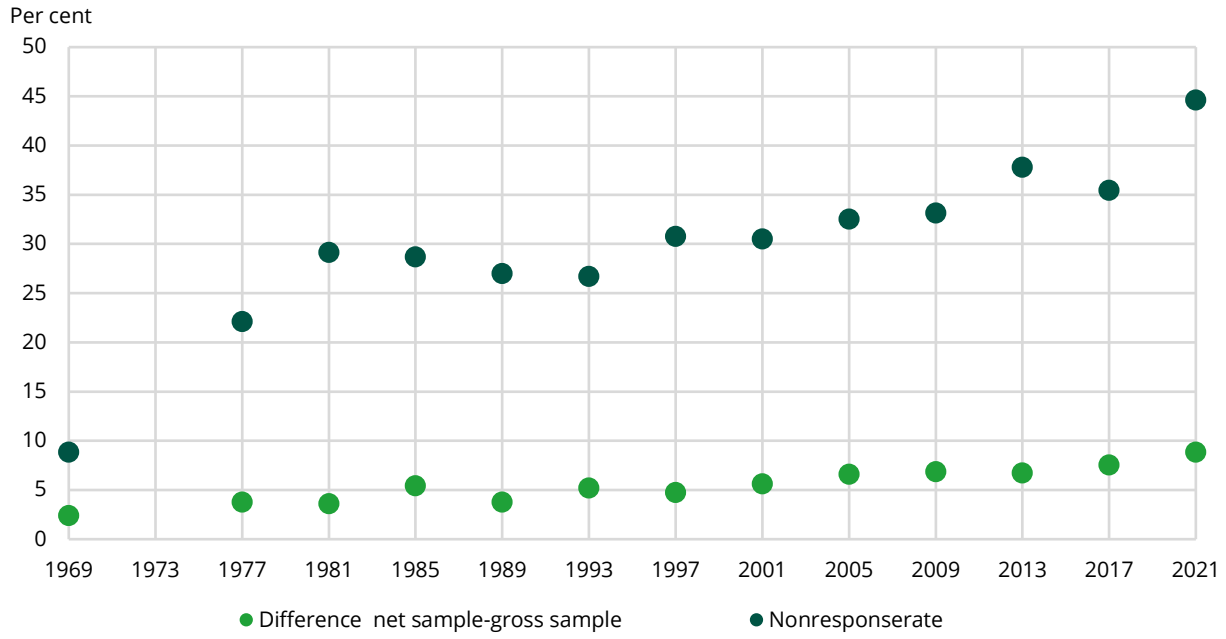
Including follow-up survey. 1973 register check not performed.
Error bars: 95 % confidence interval
Source: The General Election Survey. Statistics Norway. See The data basis for the figures. Figure data 4.1

The overall picture is that voters have a higher propensity to respond compared to non-voters. Clearly there is a selection effect in all the 13 editions of the NO-GES. Hence, the turnout estimate would be biased, showing a higher number of voters. The difference has increased over the years.

Response rates are decreasing, and nonresponse bias is slightly increasing

As explained in section 3.2, response rates are dropping, and to a certain extent this is something we let happen. Maintaining high response rates is extremely costly and time consuming and can also delay the dissemination of statistics. Even when the response rate was 90 per cent in 1969 there still was nonresponse bias, and to reach a response rate of nearly 100 per cent is probably not possible, and certainly not within a reasonable time frame and budget.

Figure 4.2 Difference in turnout between net sample and gross sample. Nonresponse rates. The General Election Survey (NO-GES). 1969-2021. Per cent



Source: The General Election Survey. Statistics Norway. See The data basis for the figures. Figure data 4.2

Nonresponse under different scenarios

In previous articles we have used paradata and simulated nonresponse error for electoral turnout based on characteristics by the respondents, initial respondents (easy-to-get) and reluctant respondents who only participate due to extensive follow-up from the field organisation.[1] In table 4.1 we show an analysis where we simulate the nonresponse effect for a response rate of 25 per cent, 50 per cent and over 50 per cent. The bias in the estimate of turnout is reduced when the response rate is increased. We look at 2009 as an illustration. The mean turnout in the gross sample is 77.8. The mean turnout in the full net sample is 85.1. If we had stopped the survey with a response rate of 25 per cent, the mean turnout would have been 88.2. This nonresponse error is reduced if we reweight the estimate by auxiliary variables. With a 25 per cent response rate and reweighted by gender, age and educational level, the turnout estimate would be 86 per cent. Because we don't stop at 25 per cent but reach 60 per cent (in 2009), the bias is reduced, and we receive a turnout estimate of 85.1. With reweighting the estimate drops to 83.8, which is still significantly higher than the mean turnout in the gross sample. To remove the bias, we will need a much higher response rates than 60 per cent, although it must be noted that in 1969 even a response rate of 90 per cent did not remove the nonresponse bias in this variable.

[1] The term paradata was introduced by Couper (1998), and it is defined as auxiliary data about the process of data collection in both the contact and the response phase, hence the term process data is also used to indicate the same type of data. Paradata are a by-product of the data collection process, and display the behaviour of respondents during data collection.

Table 4.1. The election survey 1997-2017. Electoral turnout from register in different scenarios of response rates. Per cent

	1997	2001	2005	2009	2013	2017
Mean turnout in gross sample	81,3	77,2	79,4	77,8	79,3	79,7
Not cumulative, unweighted						
Mean turnout in first 25%	92.4	85.6	88.3	88.2	88.7	91.8
Mean turnout in 25–50%	86.4	84.1	85.9	84.9	85.2	88.4
Mean turnout in the rest (55–70%)	77.9	77.9	83.4	78.4	75.8	77.5
Non-respondents	70.9	64.2	66.7	68.0	71.3	67.9
Cumulative						
Mean turnout in first 25%	92.4	85.6	88.3	88.2	88.7	91.8
Mean turnout in 50%	89.2	84.8	87.0	86.5	86.9	89.9
Mean turnout in full net sample	85.9	82.8	86.0	85.1	85.7	87.4
Cumulative, reweighted						
Mean turnout in first 25%	91.9	84.3	87.3	86.0	86.9	89.7
Mean turnout in 50%	88.7	83.5	86.4	84.9	85.5	88.7
Mean turnout in full net sample	85.9	82.1	85.6	83.8	84.6	86.3

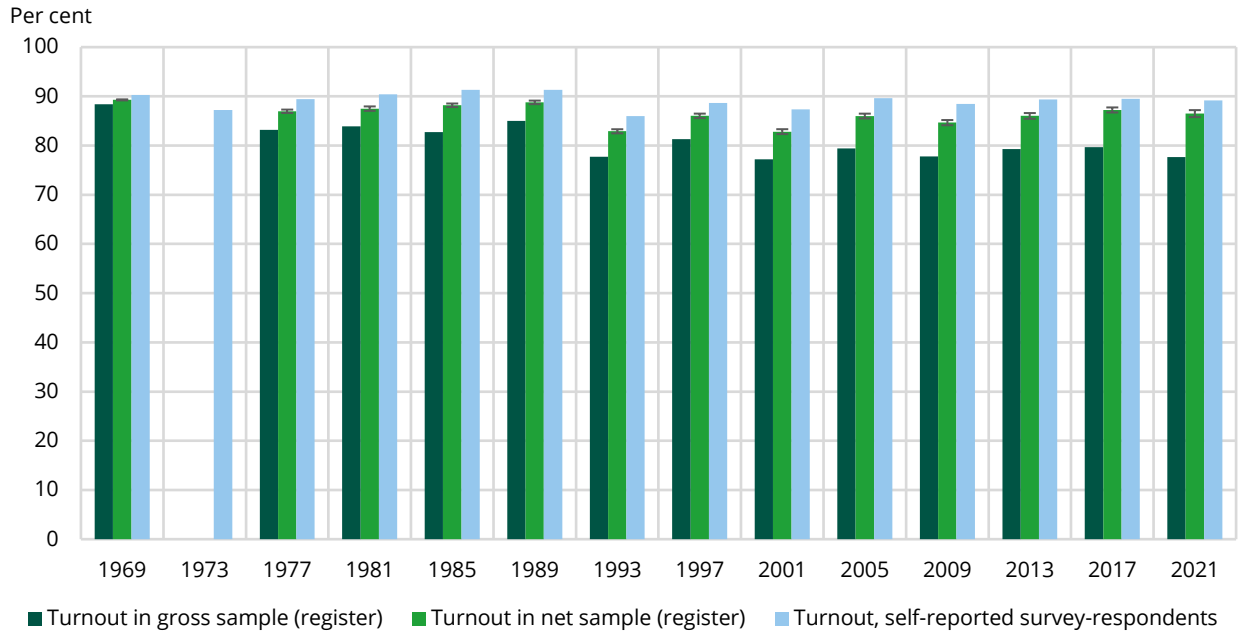
Reweighting, adjustment cells (Gender*age*education)
Source: Election Statistics and General Election Survey. Statistics Norway

As response rates fall, the response error also increases in terms of turnout estimates. But this is an error source we, to some extent, can control, describe, and consider in our reweighting models. A considerable number of articles and manuals have been written on how to deal with nonresponse errors (see e.g Thomsen 2006; Zhang et al. 2013). But for some subgroups like young people and especially young people with low education, nonresponse is a serious threat to the precision of the estimates from surveys. Now let's turn to another important non-sampling error, measurement errors.

4.2. Measurement errors

Measurement errors occur during data collection and cause the recorded values of variables to be different from the true values (see section 2.4). For many surveys, measurement error is the most problematic source of error (see e.g. Alwin 2007). Measurement errors may be difficult to detect except when they lead to illogical or inconsistent responses. In other cases, auxiliary variables are necessary. One approach to exploring bias is to compare the survey response to the register information. In figure 4.3 we add the percentage in the net sample who claim they voted to a chart like figure 4.2. This reveals that there are clear indications of measurement bias towards over-reporting.

Figure 4.3 Turnout in gross sample, net sample from register and from self-reporting from respondents. The General Election Survey (NO-GES). 1969-2021. Per cent



Including follow-up survey. 1973 register check not performed.
Error bars: 95% confidence interval for the net sample versus the gross sample
Source: Election Statistics and General Election Survey. Statistics Norway. See The data basis for the figures. Figure data 4.3

Proof of social desirability bias, more respondents 'over-report'

Table 4.2 shows the combination of the answer to the survey question '*Did you vote at the general election held in the autumn?*' and the information from the register. The overall agreement rate is between 92 and 99 per cent from 1969 until 2021. On average, the agreement rate is 96 per cent. Table 4.3 shows that 'over-reporting' is more common than 'under-reporting'. The combination 'Did not vote according to register' and 'voted according to survey' varies between 1.1 percentage point in 1969 and 6.2 points in 2001. In the two most recent elections, it was about 3 percentage points. The combination 'voted according to register and did not vote according to survey' varies between 0.1 in 1969 and 1.7 points in 2001. In the two most recent elections it was about 0.5 of a percentage point. For all years, the difference is significant and worth noting.

Table 4.2 Agreement and non-agreement rate, electoral turnout register and survey. The General Election Survey (NO-GES). 1969-2021. Per cent

	1969	1977	1981	1985	1989	1993	1997	2001	2005	2009	2013	2017	2021
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Agreement	98.8	96.0	96.6	94.4	96.6	95.6	96.3	92.1	95.8	94.2	95.3	96.5	96.3
Non-agreement	1.2	4.0	3.4	5.6	3.4	4.4	3.7	7.9	4.2	5.8	4.7	3.5	3.7
Number of observations	2 734	1 719	1 561	2 116	2 174	2 187	2 048	2 050	2 001	1 968	1 953	2 053	1 769

Including follow-up survey. 1973 register check not performed.
Source: General Election Survey. Statistics Norway

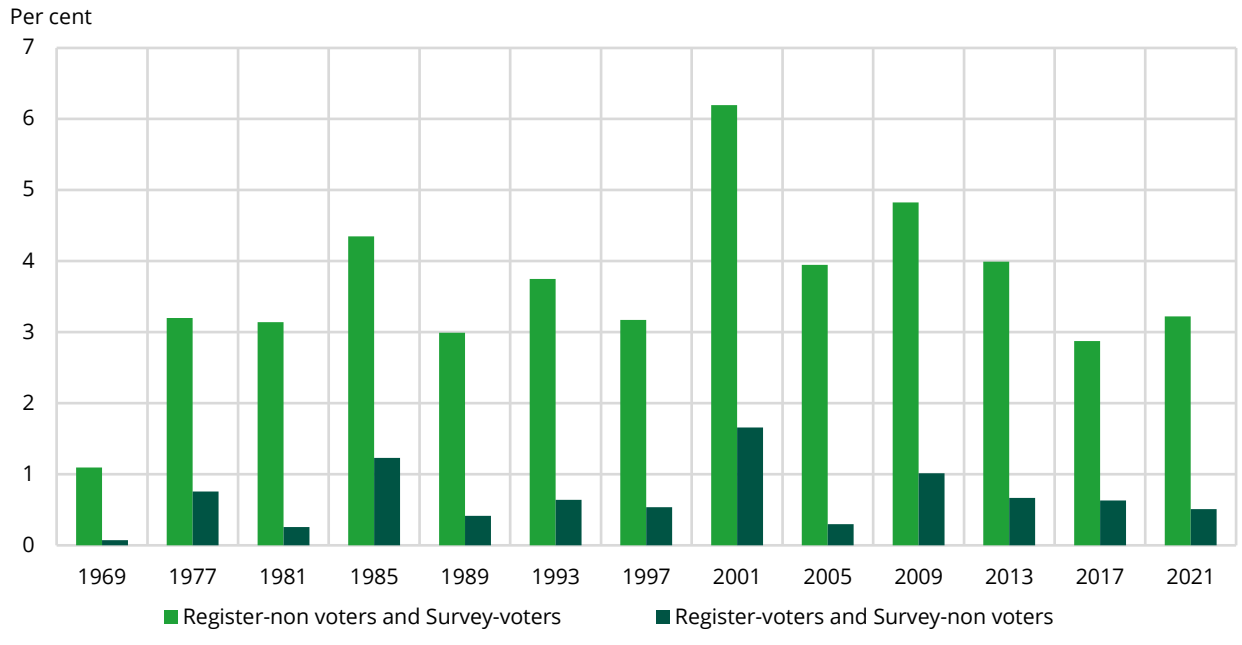
Table 4.3 Voted or did not vote according to register*survey by survey respondents. The General Election Survey (NO-GES). 1969-2021. Per cent

	Total	Voted according to register and voted according to survey	Did not vote according to register and did not vote according to survey	Did not vote according to register and voted according to survey	Voted according to register and did not vote according to survey	Number of observations
1969	100.0	89.2	9.6	1.1	0.1	2 734
1977	100.0	86.2	9.8	3.2	0.8	1 719
1981	100.0	87.3	9.4	3.1	0.3	1 561
1985	100.0	87.0	7.5	4.3	1.2	2 116
1989	100.0	88.4	8.2	3.0	0.4	2 174
1993	100.0	82.3	13.4	3.7	0.6	2 187
1997	100.0	85.5	10.8	3.2	0.5	2 048
2001	100.0	81.2	11.0	6.2	1.7	2 050
2005	100.0	85.7	10.0	3.9	0.3	2 001
2009	100.0	83.6	10.5	4.8	1.0	1 968
2013	100.0	85.4	10.0	4.0	0.7	1 953
2017	100.0	86.6	9.9	2.9	0.6	2 053
2021	100.0	86.0	10.3	3.2	0.5	1 769

Including follow-up survey. 1973 register check not performed.
Source: General Election Survey. Statistics Norway

Both over-reporting and under-reporting reached their highest level in 2001 (see figure 4.4). We speculate that this might have something to do with the fact that in this year a pre-election survey was conducted (including the same sample), and the number of call backs was historically high to maximise the responses. This might have introduced more measurement errors into the survey. After the 2001 collection, more emphasis was placed on the association between nonresponse errors and other error sources like measurement errors.

Figure 4.4 Non agreement register*survey. The General Election Survey (NO-GES). 1969-2021. Per cent



Including follow-up survey.
Source: General Election Survey. Statistics Norway. See The data basis for the figures. Figure data 4.4

Measurement errors by gender, age and education level

Is the agreement rate different for men and women, for young and old respondents, or for respondents with different levels of education? Table 4.4 shows the agreement rate for 18 different strata from the sample frame. We have limited this table to the years 1997–2017. In the table we

combine gender, age in 3 cuts, and level of education in 3 cuts. The agreement rate is highest among the oldest respondents and among those with a high education level (university level). But the differences are not that big. The lowest agreement rate is among women age 35–59 with low education (83.9), but in the previous election it was 96.5 for the same group. No one of the strata shows a 100 per cent agreement rate for all years. In table 4.5 we also show the percentage who under-report and over-report by the same strata.

Table 4.4 Agreement rate by gender*age*education level. The General Election Survey (NO-GES). 1997-2017. Per cent

	Agreement rate						Number of observations					
	1997	2001	2005	2009	2013	2017	1997	2001	2005	2009	2013	2017
Men. 18-34. Low education	100.0	84.4	88.9	84.2	87.8	93.7	25	32	36	76	82	79
Men. 35-59. Low education	94.9	91.9	100.0	96.8	94.1	93.5	99	62	79	63	68	77
Men. 60-79. Low education	98.8	94.7	98.0	88.4	97.4	97.4	81	57	51	69	38	39
Men. 18-34. Middle education	92.7	86.7	92.3	88.3	95.3	96.8	289	218	181	94	85	93
Men. 35-59. Middle education	98.2	94.3	94.1	94.7	92.5	95.7	341	299	306	208	186	210
Men. 60-79. Middle education	97.4	98.2	98.4	95.2	97.2	98.6	115	110	127	105	107	146
Men. 18-34. High education	100.0	93.8	96.9	93.5	92.9	97.1	45	64	64	46	56	70
Men. 35-59. High education	96.2	93.1	97.5	97.2	96.9	97.2	79	131	158	176	161	181
Men. 60-79. High education	100.0	96.0	94.8	98.7	100.0	100.0	14	50	58	77	87	94
Woman. 18-34. Low education	100.0	87.9	93.1	88.9	91.5	93.2	24	33	29	63	59	59
Woman. 35-59. Low education	96.1	95.1	96.5	83.9	95.2	95.6	77	61	57	56	62	68
Woman. 60-79. Low education	94.4	91.7	97.5	97.8	94.3	94.4	90	72	40	45	35	36
Woman. 18-34. Middle education	95.3	92.6	95.1	94.4	91.9	89.0	256	175	142	71	62	73
Woman. 35-59. Middle education	96.6	96.1	94.6	94.7	95.6	97.9	298	259	257	170	160	141
Woman. 60-79. Middle education	98.0	93.4	99.1	98.2	95.8	97.4	102	121	112	114	118	115
Woman. 18-34. High education	91.7	90.6	93.5	95.1	92.9	98.1	48	106	92	82	84	106
Woman. 35-59. High education	95.5	96.2	97.4	95.8	97.4	97.8	66	133	153	190	190	223
Woman. 60-79. High education	100.0	94.3	100.0	93.3	98.5	97.3	4	35	59	45	66	75

Source: General Election Survey. Statistics Norway

Table 4.5 Under-reporting and over-reporting by gender*age*education level. The General Election Survey (NO-GES). 1997–2017. Per cent

	Under-reporting						Over-reporting					
	1997	2001	2005	2009	2013	2017	1997	2001	2005	2009	2013	2017
Men. 18-34. Low education	0.0	3.1	0.0	1.3	2.4	1.3	0.0	12.5	11.1	14.5	9.8	5.1
Men. 35-59. Low education	2.0	1.6	0.0	0.0	1.5	0.0	3.0	6.5	0.0	3.2	4.4	6.5
Men. 60-79. Low education	0.0	0.0	0.0	1.4	0.0	0.0	1.2	5.3	2.0	10.1	2.6	2.6
Men. 18-34. Middle education	0.7	0.9	1.1	6.4	0.0	0.0	6.6	12.4	6.6	5.3	4.7	3.2
Men. 35-59. Middle education	0.0	0.0	0.7	0.0	0.5	0.5	1.8	5.7	5.2	5.3	7.0	3.8
Men. 60-79. Middle education	0.0	0.9	0.0	1.0	0.9	0.7	2.6	0.9	1.6	3.8	1.9	0.7
Men. 18-34. High education	0.0	0.0	0.0	0.0	0.0	1.4	0.0	6.3	3.1	6.5	7.1	1.4
Men. 35-59. High education	0.0	0.0	0.0	0.0	0.0	0.0	3.8	6.9	2.5	2.8	3.1	2.8
Men. 60-79. High education	0.0	0.0	0.0	1.3	0.0	0.0	0.0	4.0	5.2	0.0	0.0	0.0
Woman. 18-34. Low education	0.0	3.0	0.0	0.0	1.7	1.7	0.0	9.1	6.9	11.1	6.8	5.1
Woman. 35-59. Low education	0.0	0.0	0.0	7.1	0.0	0.0	3.9	4.9	3.5	8.9	4.8	4.4
Woman. 60-79. Low education	0.0	0.0	0.0	0.0	2.9	2.8	5.6	8.3	2.5	2.2	2.9	2.8
Woman. 18-34. Middle education	2.0	1.1	1.4	0.0	0.0	1.4	2.7	6.3	3.5	5.6	8.1	9.6
Woman. 35-59. Middle education	0.7	0.0	0.0	0.0	0.0	0.0	2.7	3.9	5.4	5.3	4.4	2.1
Woman. 60-79. Middle education	0.0	1.7	0.0	0.9	0.0	0.9	2.0	5.0	0.9	0.9	4.2	1.7
Woman. 18-34. High education	0.0	0.0	0.0	1.2	1.2	0.9	8.3	9.4	6.5	3.7	6.0	0.9
Woman. 35-59. High education	0.0	0.0	0.0	0.0	0.5	0.0	4.5	3.8	2.6	4.2	2.1	2.2
Woman. 60-79. High education	0.0	0.0	0.0	0.0	0.0	1.3	0.0	5.7	0.0	6.7	1.5	1.3

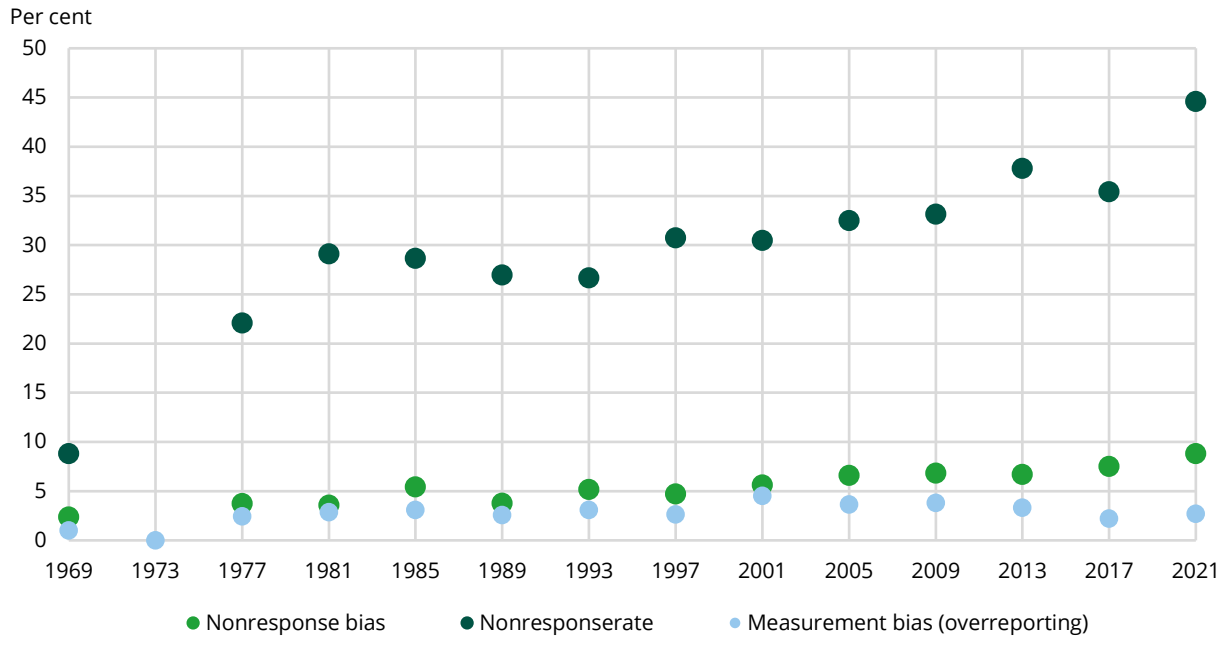
Source: General Election Survey. Statistics Norway. Number of observations, see table 4.4.

4.3. Bias introduced by nonresponse is greater than bias caused by measurement error

In figure 4.5 we include measurement bias in the same chart as figure 4.2 The measurement error bias will be smaller than the measurement error; it is the percentage of 'Did not vote according to register' responses minus the 'Voted according to register and did not vote according to survey' responses. The measurement error bias is relatively low for all years. In 1969, it is 1 per cent, and it peaks in 2001 (4.5 percent) before dipping below 3 per cent in 2017 and 2021. It seems like the measurement error bias has some association with the response rate. When the response rate decreases, the measurement bias also shows a little decrease for the last elections. However, we must keep in mind that there is a slight mode shift: introducing self-completion modes can reduce the bias caused by having an interviewer present but easing up and not pursuing 'hard-to-get' respondents can reduce measurement bias. In research on survey methodology, there is some debate over whether going after 'hard-to get' respondents can increase measurement errors. In this case, we will need more analysis in which we also consider mode effects, ordering effects, wording of the question etc. before we can draw any conclusions.

Overall the measurement error bias is rather small, and it is smaller than the nonresponse bias. This is the case for all years. Nonresponse error is a problem in survey statistics, end even response rates as high 90 per cent show a considerable nonresponse bias.

Figure 4.5. Response rates, nonresponse bias (register) and measurement bias (survey Q) on turnout estimate. The General Election Survey (NO-GES). 1969–2021



Including follow-up survey.
Source: The General Election Survey. Statistics Norway. See The data basis for the figures. Figure data 4.5

Both nonresponse bias and overreporting is largest among young and low educated

In table 4.6 we show the differences in register-turnout in the gross sample, the net sample and self-reported turnout by gender, age group and level of education. This table is limited to the surveys between 1997 and 2017. There is a pattern that the nonresponse bias is greater for young people and people with low education. Also, the measurement error is greater for the same subgroups. This is the same subgroups with the lowest turnout rate. If we will rely solely on the self-reported estimates the differences in turnout rate could hide important differences between subgroups. If the nonresponse bias and the overreporting (measurement bias) was evenly and/or randomly

distributed across subgroups the estimation of differences between the subgroups would not be affected by the errors. But this is not always the case, and the problem will increase when more background variables is considered. This problem will be pursued further in the years to come.

Table 4.6 Turnout in gross sample (register), net sample (register), self-reported survey. By gender, age group and level of education. The General Election Survey (NO-GES). 1997–2017. Per cent

	Turnout						Number of observations					
	1997	2001	2005	2009	2013	2017	1997	2001	2005	2009	2013	2017
Gross sample - reg												
Male	78.9	76.8	78.6	77.4	77.5	77.0	1519	1455	1528	1506	1560	1587
Woman	82.6	77.5	80.4	77.9	79.9	82.3	1481	1495	1472	1494	1640	1613
Net sample - reg												
Male	84.3	82.0	85.8	84.7	84.5	86.1	1088	1029	1065	929	877	1018
Woman	87.8	83.6	86.3	85.5	87.1	88.8	967	1023	947	853	852	948
Survey - question												
Male	87.1	88.8	89.6	89.3	88.5	88.6	1088	1029	1065	929	877	1018
Woman	90.5	88.8	89.7	89.9	91.0	91.5	967	1023	947	853	852	948
Gross sample - reg												
18-34	70.9	65.6	69.4	64.9	70.3	69.4	973	944	852	820	902	892
35-59	85.6	81.8	82.5	81.8	79.6	81.2	1346	1359	1466	1441	1493	1458
60-79	85.3	84.4	85.5	83.6	86.7	88.0	681	647	682	739	805	850
Net sample - reg												
18-34	76.2	71.3	75.9	72.4	77.1	78.8	688	634	548	443	436	510
35-59	90.8	87.3	88.8	88.6	86.6	88.7	961	960	1013	877	837	933
60-79	90.9	89.5	92	90.5	92.5	93.3	406	458	451	462	456	523
Survey - question												
18-34	79.6	79.8	80.7	78.4	83.4	82.3	688	634	548	443	436	510
35-59	93.1	92.5	92.6	93.1	90.6	91.9	961	960	1013	877	837	933
60-79	93.6	93.5	94.0	93.4	94.2	93.9	406	458	451	462	456	523
Gross sample - reg												
Low education	77.7	71.3	74.4	64.0	67.6	64.0	699	561	493	816	803	798
Middle education	80.6	75.7	77.5	78.9	77.1	80.3	1981	1741	1711	1303	1396	1343
High education	88.8	86.1	86.8	88.5	90.0	90.7	320	648	796	881	1001	1059
Net sample - reg												
Low education	85.1	79.2	83.1	72.3	76.1	76.1	396	328	295	385	351	381
Middle education	85.3	81.1	83.8	85.5	83.1	86.3	1403	1200	1132	773	728	816
High education	90.6	89.1	91.8	92.6	94	94.1	256	524	585	624	650	769
Survey - question												
Low education	87.6	85.5	86.6	79.7	80.2	80.5	396	328	295	385	351	381
Middle education	87.9	86.8	87.7	89.2	88.0	88.9	1403	1200	1132	773	728	816
High education	94.5	95.2	95.0	96.0	96.7	95.6	256	524	585	624	650	769

Not including follow-up survey.
Source: The General Election Survey. Statistics Norway

4.4. Are respondents who respond ‘don’t know’ or ‘no answer’ non-voters?

Some respondents participated in the survey but were not willing to provide an answer to the question about whether they voted in the last election. Other respondents answered the question but refused for some reason to reveal what party they voted for. Are a great share of those respondents really concealed non-voters? In table 4.7 we see that this is not the case. In fact, on average over the years, about three out of four respondents who did not answer the question, did you vote in the last election, voted according to the register.

Table 4.7 Respondents answered, don't know or no answer to the question: Did you vote in the last election? By voted and did not vote according to register. The General Election Survey (NO-GES). 1997–2021. Per cent

	1997	2001	2005	2009	2013	2017	2021
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Voted according to register	50.0	75.0	90.0	55.0	75.0	83.3	74.2
Did not vote according to register	50.0	25.0	10.0	45.0	25.0	16.7	25.8
Number of observations	2	32	10	20	20	24	31

Source: The General Election Survey. Statistics Norway

But what about the respondents who provided an answer to the question did you vote in the last election but refused to reveal what party they voted for? In 1997, only four respondents answered the question 'did you vote in the election?' but refuse to say which party they voted for. In 2021 this number increased to 119 respondents. This is not a big share of the respondents, although it is much higher compared to earlier years. We speculate that this has something to do with the switch in interview mode; more interviews were done by self-completion in 2021 compared to earlier. Table 4.8 reveals that regardless of interview mode, the respondents who answered yes to the question 'Did you vote in the last election?' but did not reveal which party the voted for were by and large actually voters.

Table 4.8 Respondents who answered they voted in the survey but refused to answer which party. By voted and did not vote according to register. The General Election Survey (NO-GES). 1997-2021. Per cent

	1997	2001	2005	2009	2013	2017	2021
Total	100,0	100,0	100,0	100,0	100,0	100,0	100,0
Voted according to register	75.0	90.2	94.3	92.9	90.3	96.5	92.4
Did not vote according to register	25.0	9.8	5.7	7.1	9.7	3.5	7.6
Number of observations	4	41	35	28	31	57	119

Source: The General Election Survey. Statistics Norway

4.5. Party preference for 'over-reporters'

A small group of respondents, between 100 and 50 in the most recent surveys, claim to have voted in the election but were not confirmed to be voters in the register. Does this group of respondents lean in any political direction? In table 4.9 we show party choice in the last four general elections (1977–2021). The estimates are divided into three categories: total, regardless of agreement/non-agreement, the respondent group where there is agreement between register and survey, and finally the group where the two sources don't agree. The estimates in table 4.9 indicate that respondents who claimed to have voted whose votes were not confirmed by the register are spread across parties.

Table 4.9 Party choice among respondents, by agreement or non-agreement, voted or did not vote register*survey. The General Election Survey 1977–2021. Per cent

	Red Party	Soc. Left.P.	Labour Party	Centre Party	Green Party	C.D.P	Liberal Party	Cons. Party	Prog. Party	Other	*n*
1977 total	0.4	4.5	44.5	9.0	.	11.2	3.6	23.6	1.3	1.8	1 515
Agreement register survey	0.4	4.7	44.1	9.2	.	11.5	3.6	23.3	1.2	1.9	1 461
Non-agreement reg. surv.	0.0	0.0	55.6	3.7	.	3.7	3.7	31.5	1.9	0.0	54
1981 total	0.5	4.7	37.7	6.8	.	8.3	4.3	31.7	4.5	1.5	1 396
Agreement register survey	0.5	4.7	37.5	7.0	.	8.5	4.4	31.5	4.4	1.5	1 348
Non-agreement reg. surv.	0.0	6.3	41.7	0.0	.	4.2	2.1	35.4	8.3	2.1	48
1985 total	0.5	5.4	36.0	6.5	.	9.1	9.1	29.1	3.4	0.8	2 048
Agreement register survey	0.5	5.4	36.1	6.6	.	9.2	9.2	28.7	3.4	0.8	1 952
Non-agreement reg. surv.	1.0	5.2	34.4	5.2	.	7.3	7.3	36.5	3.1	0.0	96
1989 total	0.9	12.2	33.6	6.0	..	8.7	4.2	21.9	11.5	0.9	1 901
Agreement register survey	1.0	12.1	33.5	6.0	..	8.9	4.2	22.0	11.2	1.0	1 837
Non-agreement reg. surv.	0.0	13.3	36.7	5.0	..	3.3	1.7	20.0	20.0	0.0	60
1993 total	1.0	7.8	39.6	18.2	..	7.0	3.6	15.9	4.6	2.2	1 812
Agreement register survey	1.0	7.8	39.3	18.2	..	7.2	3.6	16.0	4.7	2.2	1 738
Non-agreement reg.-surv.	1.4	8.1	47.3	18.9	..	1.4	5.4	14.9	1.4	1.4	74
1997 total	1.6	7.0	35.7	7.9	0.1	15.1	4.8	15.6	11.2	1.0	1 778
Agreement register survey	1.6	6.9	35.6	7.8	0.1	15.4	4.9	15.6	11.2	0.9	1 717
Non-agreement reg.-surv.	1.6	11.5	37.7	11.5	0.0	6.6	1.6	14.8	11.5	3.3	61
2001 total	1.5	14.5	21.7	5.6	0.1	12.9	4.3	26.4	10.7	2.2	1 750
Agreement register survey	1.4	14.5	21.9	5.7	0.1	13.2	4.3	26.2	10.4	2.3	1 627
Non-agreement reg. surv.	3.3	14.6	19.5	4.1	0.8	8.9	4.9	28.5	13.8	1.6	123
2005 total	1.1	10.3	33.8	7.6	0.1	5.4	5.7	16.0	18.6	1.3	1 759
Agreement register survey	1.1	10.3	33.8	7.7	0.1	5.4	5.8	16.2	18.4	1.2	1 682
Non-agreement reg. surv.	0.0	10.4	33.8	5.2	0.0	5.2	3.9	13.0	24.7	3.9	77
2009 total	1.3	7.9	35.4	6.7	0.2	4.6	4.3	20.0	19.3	0.2	1 706
Agreement register survey	1.4	7.7	35.2	6.9	0.2	4.7	4.2	20.0	19.4	0.2	1 601
Non-agreement reg. surv.	1.1	11.8	38.7	4.3	0.0	3.2	3.2	19.4	18.3	0.0	93
2013 total	1.2	4.3	30.7	5.5	2.7	5.8	6.9	29.3	12.7	1.0	1 660
Agreement register survey	1.3	4.4	30.5	5.7	2.6	6.0	7.0	28.9	12.6	1.1	1 588
Non-agreement reg. surv.	0.0	2.8	34.7	1.4	4.2	0.0	5.6	37.5	13.9	0.0	72
2017 total	3.4	7.4	24.6	10.1	3.2	4.4	5.6	26.3	11.7	3.1	1 758
Agreement register survey	3.4	7.4	24.5	10.4	3.2	4.5	5.6	26.1	11.9	3.0	1 703
Non-agreement reg. surv.	3.6	7.3	27.3	1.8	3.6	3.6	5.5	34.5	5.5	7.3	55
2021 total	6.2	9.9	23.8	13.2	3.7	3.9	5.3	19.8	8.2	3.1	1 503
Agreement register survey	6.2	9.9	23.9	13.4	3.8	4.0	5.0	19.9	8.3	2.8	1 450
Non-agreement reg. surv.	5.7	11.3	22.6	9.4	0.0	0.0	11.3	17.0	3.8	9.4	53

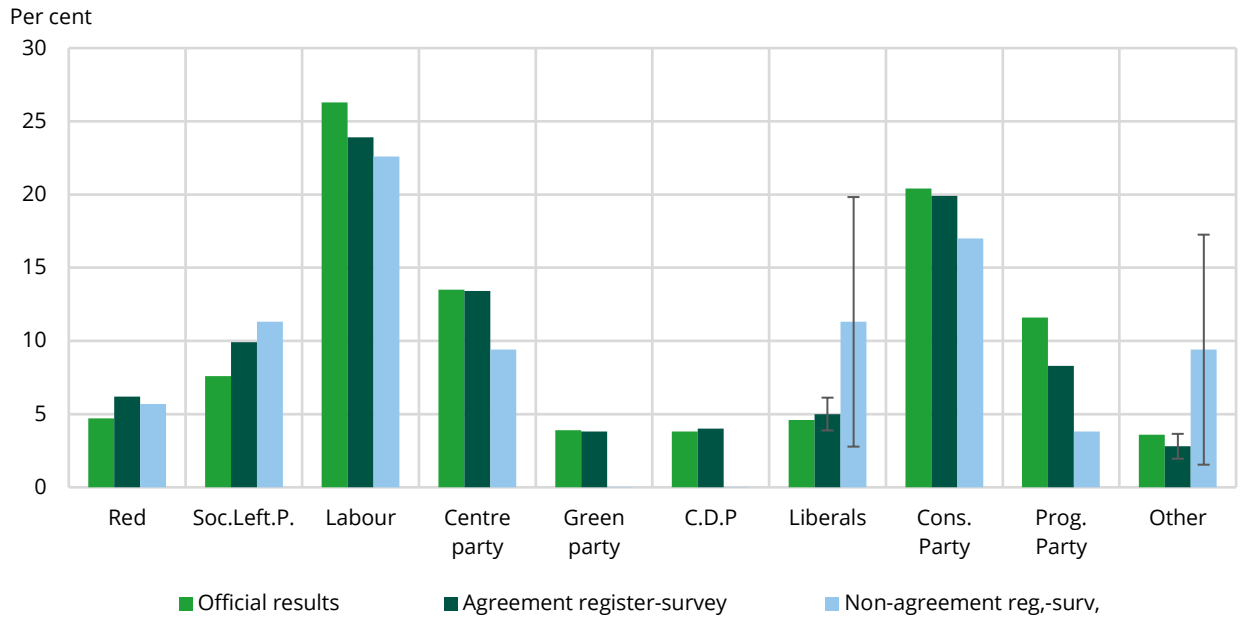
n: number of observations
Soc. Left.P = Socialist Left Party, C.D.P = Christian Democratic Party, Cons. Party = Conservative Party, Prog. Party = Progress Party
Source: The General Election Survey. Statistics Norway

There is no clear partisan tendency. The traditional two main competing parties, the Labour party and the Conservative party received the main share of votes among the 'non-agreement respondents'. There is no clear pattern that the 'non-agreement respondents' swing towards the parties 'winning' the election. There are some interesting results, especially regarding the Conservative Party. In elections where the Conservative Party had more voters, a slightly higher share of non-agreement respondents claimed to have voted for the party. For example, in 2001 the

Conservative Party increased their share of votes by almost 7 percentage points compared to the 1997 election. In the 2001 survey, 26.2 per cent of the agreement register survey respondents reported having voted for the Conservative Party, and 28.5 per cent of the non-agreement register-survey respondents reported having voted for the. But for other parties the pattern is not as straightforward. The Christian Democratic Party (CDP) is the only party for which the results for every year show that fewer 'non-agreement register survey respondents' claim to have voted the party compared to the agreement register-survey respondents. In 1997, the Christian Democratic Party increased their share of voters by almost 6 percentage points compared to the election in 1993, but the share of CDP 'voters' among the 'non-agreement register survey respondents' is considerably lower compared to the CDP voters among the 'agreement register survey respondents'. If we consider all elections and all parties, there is no clear pattern one way or the other regarding how the 'non-agreement register survey respondents' swing.

The 'non-agreement register survey respondents' is a small group, so there will be some differences between the groups, but these differences are not statistically significant. As an illustration, if we consider the latest election in 2021, the share of Liberal Party 'voters' among the non-agreement register survey respondents is 11 percentage points, whereas among the agreement register survey respondents it is 5 percentage points. But as we see in figure 4.6, the standard errors are considerable, and the estimates fall within the confidence interval.

Figure 4.6. Party choice among respondents, by agreement or non-agreement, voted or did not vote register*survey. The General Election Survey 2021. Per cent



Soc. Left.P = Socialist Left Party, C.D.P = Christian Democratic Party, Cons. Party = Conservative Party, Prog. Party = Progress Party
Error bars: 95 % confidence interval
Source: The General Election Survey. Statistics Norway. See The data basis for the figures. Figure data 4.6

5. Summary and discussion

When we produce estimates of electoral turnout from surveys, the surveys will almost certainly show a higher percentage of voters than the official election results. Both nonresponse bias and measurement bias (over-reporting) contribute to this. The two error sources pull in the same direction. Nonresponse bias is of much greater concern compared to measurement bias (over-reporting). Our analysis shows an agreement rate between 92 and 99 per cent from 1969 until 2021. On average, the agreement rate is 96 per cent, which is high compared to other survey variables (e.g. Kleven and Ringdal 2020). In a self-completion web survey in 2017, the agreement rate was 98.8 per cent. In a similar survey in 2021, the agreement rate was 97.5 per cent. This indicates that there is an interviewer effect present, and that self-completion surveys can produce estimates with lower measurement bias (but normally receive lower response rates).

Still, over-reporting always occurs, and voters are more liable to over-report than under-report. We speculate that this has something to do with the 'social desirability bias', which refers to people's tendency to present themselves in a way that reflects well on them. For example, there is a social norm that one should be an active citizen and participate in elections. Some respondents didn't want to reveal their party preference; hence, not all respondents answered the question about how they voted after the question about voting. We can only speculate as to why more of these respondents answered that they did not vote and then omitted the party choice question. The share of respondent who claimed to have voted but were not registered as having voted may simply be politically conscious citizens who for some reason 'missed' the election.

Statistics Norway omits non-agreement respondents in the statistics produced by the election surveys. The conventional view is that including them can introduce more bias in the estimates. The only downside is a very small reduction in the net sample with little impact on the variance estimates (it is a very small group after all).

From our analysis, it is not clear that including these respondents in the estimates or the analysis really causes bias. A respondent who claimed to have voted for *Party_A* but, did not vote can be a 'representative' for *Party_A* voters. It is not very likely that respondents express random party preferences or claim to have voted for a party that is opposed to their ideological beliefs. It is not very likely that a left-winger would claim to have voted for a right-wing party and vice versa. Some parties are more accepted than other in different segments in society, which might explain the phenomena of over-reporting; the presence of an interviewer might also explain over-reporting.

However, in our experience, 'social desirability bias' and stated party preference is more of a nonresponse problem than a measurement problem. Voters who feel they vote for a party that is not 'accepted' among their family, friends or colleagues are less likely to respond to the survey in the first place.

Nonresponse errors can cause severe bias in estimates but is often easier to deal with than measurement errors. Biased estimates due to nonresponse can be approximately corrected if the nonresponse mechanism is *MAR* (missing at random), in which case the mechanism is known and can be attributed to one or more auxiliary variables.

Articles published in scientific journals by survey methodologists from Statistics Norway have previously demonstrated that in reweighting models using the survey response variable on turnout reduces nonresponse bias in approximately the same way as using register variables. Several scientific papers and articles have been published using electoral turnout as a vehicle to demonstrate the nonresponse mechanism. Because register turnout from the sample frame is a known population parameter, we can gain insight into the nonresponse mechanism that also can be

adopted for other estimates in social statistics where the population parameters are more obscure (e.g. Thomsen et al. 2006, Zhang et al. 2013).

From 2013 Statistics Norway's register-based statistical system includes a register on turnout. We use the register, not surveys, to draw inference from statistical analysis between *y* (voted or did not vote) and *x*'s of interest (gender, age, education etc.). The reasons why we still do sample surveys is because we don't have access to everything on our registers. In a future where the association between non-voting and social inequality probably will increase we need more information on what might cause non-voting. Sample surveys are certainly not 100 percent right all the time but remain an import source of information. Response rates are dropping, but our knowledge of the nonresponse mechanism is improved by study the relationship between nonresponse and other error sources. In the future, more resources and efforts should be put into study the effect of measurement errors and nonresponse errors and the other interchangeable error sources to gain further insight into the relationship between nonvoters-nonrespondents, nonvoters-respondents and the quality of answers to survey questions.

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Appendix A: Tables

Table A1 Official results of the Storting elections. 1969–2021.

Year	The Red party	Socialist Left Party	Labour Party	Centre Party	Green Party	Christian Dem. P.	Liberal Party	Conservative Party	Progress Party	Other
1969	.	3.4	46.5	10.6	.	9.3	9.4	19.6	.	1.2
1973	0.4	11.2	35.3	10.8	.	12.3	3.6	17.4	5.0	3.9
1977	0.6	4.2	42.3	8.6	.	12.4	3.2	24.8	1.9	2.0
1981	0.7	5.0	37.1	6.6	.	9.4	3.9	31.8	4.5	1.0
1985	0.6	5.5	40.8	6.6	.	8.3	3.1	30.4	3.7	1.0
1989	0.8	10.1	34.3	6.5	0.4	8.5	3.2	22.2	13.0	1.0
1993	1.1	7.9	36.9	16.7	0.1	7.9	3.6	17.0	6.3	2.4
1997	1.7	6.0	35.0	7.9	0.2	13.7	4.5	14.3	15.3	1.4
2001	1.2	12.5	24.3	5.6	0.2	12.4	3.9	21.2	14.6	4.1
2005	1.2	8.8	32.7	6.5	0.1	6.8	5.9	14.1	22.1	1.8
2009	1.3	6.2	35.4	6.2	0.3	5.5	3.9	17.2	22.9	1.0
2013	1.1	4.1	30.8	5.5	2.8	5.6	5.2	26.8	16.3	1.7
2017	2.4	6.0	27.4	10.3	3.2	4.2	4.4	25.0	15.2	1.8
2021	4.7	7.6	26.3	13.5	3.9	3.8	4.6	20.4	11.6	3.6

The Red party of Norway includes Red Electoral Alliance (1973-2007) and Environment and Solidarity 1989. Socialist Left Party includes Socialist People Party 1969 and Socialistic Association for the Election 1973. Progress Party includes Anders Lange's Party 1973.
Source: Election Statistics. Statistics Norway

Table A2 Turnout in gross sample (register), net sample (register), self-reported survey. By gender*age group*level of education. The General Election Survey (NO-GES). 1997–2017. Per cent.

	Turnout						Number of observations					
	1997	2001	2005	2009	2013	2017	1997	2001	2005	2009	2013	2017
Turnout Gross sample												
Men, 18-34, Low education	56	61	53	58	63	50	44	54	55	161	170	173
Men, 35-59, Low education	78	74	81	63	69	59	157	101	124	148	142	163
Men, 60-79, Low education	82	78	85	71	73	75	140	96	73	110	86	93
Men, 18-34, Middle education	65	59	68	64	66	67	401	336	281	167	177	179
Men, 35-59, Middle education	85	82	78	82	76	79	457	412	434	345	356	309
Men, 60-79, Middle education	88	93	86	87	84	89	155	143	180	156	176	214
Men, 18-34, High education	88	76	79	81	80	87	51	83	97	78	88	99
Men, 35-59, High education	93	87	89	90	89	90	95	176	206	245	244	241
Men, 60-79, High education	95	93	86	96	98	97	19	54	78	96	121	116
Woman, 18-34, Low education	62	65	56	53	60	61	37	48	56	143	149	119
Woman, 35-59, Low education	83	69	77	66	68	70	122	114	92	133	151	145
Woman, 60-79, Low education	79	72	79	78	79	80	199	148	93	121	105	105
Woman, 18-34, Middle education	75	64	67	64	70	66	373	292	230	148	154	154
Woman, 35-59, Middle education	88	81	82	83	78	85	433	393	406	295	306	265
Woman, 60-79, Middle education	91	87	88	84	87	88	162	165	180	192	227	222
Woman, 18-34, High education	82	80	82	80	88	91	67	131	133	123	164	168
Woman, 35-59, High education	88	91	91	91	89	89	82	163	204	275	294	335
Woman, 60-79, High education	100	93	89	89	98	96	6	41	78	64	90	100
Turnout nett sample												
Men, 18-34, Low education	64	63	58	56	71	68	25	32	36	78	85	83
Men, 35-59, Low education	85	86	91	79	77	77	99	63	79	65	69	79
Men, 60-79, Low education	89	84	93	76	82	79	81	57	53	71	38	43
Men, 18-34, Middle education	71	63	75	74	72	76	289	219	182	96	87	97
Men, 35-59, Middle education	91	86	85	88	83	85	341	301	306	210	186	219
Men, 60-79, Middle education	91	96	93	92	87	95	115	112	128	105	107	147
Men, 18-34, High education	87	83	85	87	82	89	45	64	65	47	56	71
Men, 35-59, High education	94	89	94	94	94	93	79	131	158	180	161	184
Men, 60-79, High education	100	96	95	99	100	98	14	50	58	77	88	95
Woman, 18-34, Low education	71	70	76	64	75	71	24	33	29	67	59	66
Woman, 35-59, Low education	91	81	86	77	72	80	77	64	58	57	64	71
Woman, 60-79, Low education	87	80	78	92	92	90	90	79	40	47	36	39
Woman, 18-34, Middle education	80	72	72	65	73	70	257	180	144	72	64	79
Woman, 35-59, Middle education	93	87	88	89	82	91	299	264	259	173	164	150
Woman, 60-79, Middle education	94	88	93	92	93	93	102	124	113	117	120	124
Woman, 18-34, High education	88	83	86	92	89	94	48	106	92	83	85	114
Woman, 35-59, High education	89	93	94	91	95	95	66	137	153	192	193	230
Woman, 60-79, High education	100	94	95	91	97	96	4	36	59	45	67	75
Turnout survey question												
Men, 18-34, Low education	64	72	69	70	77	72	25	32	36	78	85	83
Men, 35-59, Low education	86	92	91	83	79	83	99	63	79	65	69	79
Men, 60-79, Low education	90	90	96	86	84	82	81	57	53	71	38	43
Men, 18-34, Middle education	77	75	80	73	78	80	289	219	182	96	87	97
Men, 35-59, Middle education	92	92	89	93	90	88	341	301	306	210	186	219
Men, 60-79, Middle education	94	97	95	95	88	95	115	112	128	105	107	147
Men, 18-34, High education	87	89	88	92	89	89	45	64	65	47	56	71
Men, 35-59, High education	98	95	96	97	98	96	79	131	158	180	161	184
Men, 60-79, High education	100	100	100	97	100	98	14	50	58	77	88	95
Woman, 18-34, Low education	71	76	83	75	80	75	24	33	29	67	59	66
Woman, 35-59, Low education	95	86	90	77	77	87	77	64	58	57	64	71
Woman, 60-79, Low education	92	88	80	93	91	89	90	79	40	47	36	39
Woman, 18-34, Middle education	81	77	73	70	84	78	257	180	144	72	64	79
Woman, 35-59, Middle education	95	91	93	95	86	93	299	264	259	173	164	150
Woman, 60-79, Middle education	96	91	94	92	98	94	102	124	113	117	120	124
Woman, 18-34, High education	96	93	92	94	94	95	48	106	92	83	85	114
Woman, 35-59, High education	94	97	97	96	97	97	66	137	153	192	193	230
Woman, 60-79, High education	100	100	95	98	99	96	4	36	59	45	67	75

Source: General Election Survey. Statistics Norway

The data basis for the figures

Figure data 1.1 Turnout according to self-reporting among respondents in The General Election Survey and Official Turnout Figures in the General Elections. 1969-2021. Per cent.

	Official Turnout (%)	Turnout, self-reported survey-respondents (%)	*SE*
1969	83.8	90.3	1.7
1973	80.2	87.2	2.0
1977	82.9	89.4	2.2
1981	83.2	90.4	2.2
1985	84.0	91.3	1.8
1989	83.2	91.4	1.8
1993	75.8	86.0	2.2
1997	78.3	88.7	2.1
2001	75.5	87.4	2.2
2005	77.4	89.7	2.0
2009	76.4	88.5	2.1
2013	78.2	89.3	2.1
2017	78.2	89.5	1.7
2021	77.2	89.2	1.4

Source: Election Statistics and General Election Survey. Statistics Norway

Figure data 3.1 Official turnout and turnout in gross sample. The General Election Survey (NO-GES). 1969-2021. Per cent.

	Official Turnout (%)	Turnout in gross sample (register)	SE
1969	83.8	88.4	1.7
1973	80.2	.	
1977	82.9	83.2	2.3
1981	83.2	83.9	2.3
1985	84.0	82.8	2.0
1989	83.2	85.0	1.9
1993	75.8	77.7	2.2
1997	78.3	81.3	2.1
2001	75.5	77.2	2.3
2005	77.4	79.4	2.2
2009	76.4	77.8	2.3
2013	78.2	79.3	2.1
2017	78.2	79.7	1.7
2021	77.2	77.7	1.4

Source: Election Statistics and General Election Survey. Statistics Norway

Figure data 3.2 The General Election Survey 1969-2021. Response rate (personal interview) in per cent and weeks of fieldwork.

	Responserate	Weeks of fieldwork
1969	85.6	2
1973	80.7	3
1977	78.4	7
1981	72.4	7
1985	73.5	5
1989	72.7	5
1993	73.6	7
1997	69.5	12
2001	69.6	21
2005	67.9	17
2009	60.1	19
2013	54.3	18
2017	60.8	16
2021	51.3	10

Source: The General Election Survey. Statistics Norway

Figure data 4.1 Response rate among voters and non-voters according to register. The General Election Survey (NO-GES). 1969-2021. Per cent.

	Responserate voters (register)	Responserate non-voters (register)	*SE Voters*	*SE non-voters*
1969	92.1	84.2	1.0	3.8
1973				
1977	81.4	60.4	1.8	5.0
1981	73.9	55.0	2.0	5.2
1985	76.0	48.8	1.7	4.3
1989	76.3	54.6	1.7	4.6
1993	78.2	56.2	1.7	3.8
1997	73.3	51.7	1.8	4.2
2001	74.6	52.3	1.8	3.8
2005	73.1	45.8	1.8	4.0
2009	72.7	46.2	1.8	3.8
2013	67.5	42.0	1.8	3.8
2017	70.7	40.6	1.8	3.8
2021	61.7	33.5	1.9	3.5

Source: The General Election Survey. Statistics Norway

Figure data 4.2 Difference in turnout between net sample and gross sample. Nonresponse rates. The General Election Survey (NO-GES). 1969-2021. Per cent.

Year	Difference net sample-gross sample	Nonresponserate
1969	2.4	8.8
1973		
1977	3.8	22.1
1981	3.6	29.1
1985	5.4	28.7
1989	3.8	27.0
1993	5.2	26.7
1997	4.7	30.8
2001	5.6	30.5
2005	6.6	32.5
2009	6.9	33.2
2013	6.7	37.8
2017	7.5	35.4
2021	8.8	44.6

Source: The General Election Survey. Statistics Norway

Figue data 4.3 Turnout in gross sample, net sample from register and from self-reporting from respondents. The General Election Survey (NO-GES). 1969-2021. Per cent.

	Turnout in gross sample (register)	Turnout in net sample (register)	Turnout, self-reported survey-respondents	SE Turnout in net sample
1969	88.4	89.3	90.3	0.1
1973	.	.	87.2	
1977	83.2	87.0	89.4	0.3
1981	83.9	87.5	90.4	0.4
1985	82.8	88.2	91.3	0.4
1989	85.0	88.8	91.4	0.4
1993	77.7	82.9	86.0	0.4
1997	81.3	86.0	88.7	0.5
2001	77.2	82.8	87.4	0.5
2005	79.4	86.0	89.7	0.5
2009	77.8	84.7	88.5	0.5
2013	79.3	86.0	89.3	0.6
2017	79.7	87.2	89.5	0.5
2021	77.7	86.5	89.2	0.7

Source: The General Election Survey. Statistics Norway

Figure data 4.4 Non agreement register*survey. The General Election Survey (NO-GES). 1969-2021. Per cent.

	Register-non voters and Survey-voters	Register-voters and Survey-non voters
1969	1.1	0.1
1977	3.2	0.8
1981	3.1	0.3
1985	4.3	1.2
1989	3.0	0.4
1993	3.7	0.6
1997	3.2	0.5
2001	6.2	1.7
2005	3.9	0.3
2009	4.8	1.0
2013	4.0	0.7
2017	2.9	0.6
2021	3.2	0.5

Source: The General Election Survey. Statistics Norway

Figure data 4.5. Response rates. nonresponse bias (register) and measurement bias (survey Q) on turnout estimate. The General Election Survey (NO-GES). 1969–2021.

Year	Nonresponse bias	Nonresponserate	Measurement bias (overreporting)
1969	2.4	8.8	1.0
1973			
1977	3.8	22.1	2.4
1981	3.6	29.1	2.9
1985	5.4	28.7	3.1
1989	3.8	27.0	2.6
1993	5.2	26.7	3.1
1997	4.7	30.8	2.6
2001	5.6	30.5	4.5
2005	6.6	32.5	3.6
2009	6.9	33.2	3.8
2013	6.7	37.8	3.3
2017	7.5	35.4	2.2
2021	8.8	44.6	2.7

Source: The General Election Survey. Statistics Norway

Figure data 4.6. Party choice among respondents. by agreement or non-agreement. voted or did not vote register*survey. The General Election Survey 2021. Per cent.

	Red	Soc.Left. P.	Labour	Centre party	Green party	C.D.P	Liberals	Cons. Party	Prog. Party	Other	*SE Liberals*	*SE Other*
Official results	4.7	7.6	26.3	13.5	3.9	3.8	4.6	20.4	11.6	3.6		
Agreement register-survey	6.2	9.9	23.9	13.4	3.8	4.0	5.0	19.9	8.3	2.8	1.1	0.8
Non-agreement reg.-surv.	5.7	11.3	22.6	9.4	0.0	0.0	11.3	17.0	3.8	9.4	8.5	7.9

Source: The General Election Survey. Statistics Norway