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**Does respondents' recruitment method affect the willingness-to-pay for clean-up of contaminated marine sediments?** *Comparing two internet panels and SMS recruited respondents in A Contingent Valuation Survey*

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# Abstract

The purpose of this study is to investigate the effects of combining recruitment methods from two survey agencies in a contingent valuation (CV) survey on Norwegian households' willingness to pay (WTP) for restoration of contaminated marine sediments. The 2681 respondents represent the municipalities Bodø, Horten, Moss, Stavanger and Ålesund and answered surveys concerning the condition of their local harbor. The data collection was conducted through the survey agencies Kantar and Norstat who shared the surveys with their respective access panels. In addition, Kantar reached out to potentially relevant respondents through SMS to achieve a representative sample.

Two research questions were addressed. 1) What is the effect on the composition of the sample when combining two access panels and SMS-recruitment? and 2) Does respondents' recruitment method affect WTP for clean-up of contaminated marine sediments? To compare the three recruitment methods, an interval regression was carried out. The main findings suggest that the sample appear representative of Norwegian households, thus the predicted WTP is a sufficient estimation. There was no clear evidence that combining three recruitment methods originate significantly dissimilar household WTP.

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## Abbreviations

<b>CV</b> contingent valuation
<b>ES</b> ecosystem services
<b>IMC</b> instructional manipulation check
<b>MEA</b> millennium ecosystem assessment
<b>NEA</b> norwegian environment agency
<b>PAH</b> polycyclic aromatic hydrocarbon
<b>PCB</b> polychlorinated biphenyl
<b>SP</b> stated preference
<b>SSB</b> statistics norway
<b>TBT</b> tributyltin
<b>TEEB</b> the economics of ecosystem and biodiversity
<b>TEV</b> total economic value
<b>WFD</b> water framework directive
<b>WTA</b> willingness to accept
<b>WTP</b> willingness to pay

# 1 Introduction

## 1.1 Background

Changes in land-use and the Anthropocene expansion of both pollution and emissions have been, and still is, one of the main drivers of global warming (Kaplan et al., 2011; Klein Goldewijk, Beusen, Van Drecht, & De Vos, 2011). Land-use alterations have occurred worldwide, also affecting life under the ocean surface. Industry, agriculture, and the accumulation of urbanization have polluted and distressed life, both in marine- and limnetic water bodies. Most of these changes happen both rapid and simultaneously, the effects will therefore not only be additive, but potentially synergistic as well.

Urbanization and industrialization are a few of the major factors affecting ecosystems globally, both affect the oceans from a local perspective. The interaction between pollution, climate change and alterations in land-use may lead to unpredictable second-order effects which can be unnoticed when examining only one of the factors separately (Oliver & Morecroft, 2014).

As in most other coastal regions, the first signs of human settlements are found close to the ocean where the settlers quickly established harbors. The utilization of marine areas and its species have amplified proportionally as the population and urbanization has increased.

The economic success of Norway is deeply rooted in and connected to the sea, examples are the fishing and whaling industry, the shipping industry and later the gas- and oil industry. The coastline has been tailored to match people's continuous need for goods and services from the ocean, correspondingly the sea floor has been highly altered to fit our needs in terms of dredging and capping, seismic activity and generally functioning as our dumping ground of both trash and chemicals. Emissions from industry, shipyards, sewage, runoff from landfill and agriculture, especially from the past century have contaminated the harbors and coastal areas with excessive values of organic pollutants and metals (Norway, 2006; Oen, Breedveld, Kalaitzidis, Christanis, & Cornelissen, 2006). Excessive levels of environmental toxins such as Tributyltin (TBT), Polycyclic aromatic hydrocarbon (PAH) and polychlorinated biphenyl (PCB) as well as heavy metals like Mercury and Lead are found in the sediments at numerous locations along the coast. Comprehensive procedures are made to investigate and restore the severity of the contamination, aggregated by the European Union Water Framework Directive (WFD).

The EU WFD was ratified in 2000 and included in Norwegian jurisdiction through the EEA-Agreement and Vannforskriften in 2007. Through the directive the countries are legally tied to having so-called “good status” for all water bodies, such as lakes, rivers, groundwater, and coastal water. By signing the framework, Norway declares to improve the status on all water bodies not yet recognized as good by 2021. The status is measured through monitoring concentration of elements in the water chemistry and biological parameters compared to potential deviations from the reference state.

Ecosystem services (ES) are public possessions generally deprived of a price tag, sustained by all and no-one, making jurisdiction, conservation, and valuation highly complicated. Common goods and resources are scarce and can both be deflated and destroyed. There has been an increasing interest in preserving and restoring ES by investigation peoples Willingness to Pay (WTP) for various amenities provided by nature. One way to observe non-market valuation is through stated preference (SP) surveys. These surveys function as one of few proxies of the hypothetical valuation of ES. The output of the surveys are guidelines in decision-making related to welfare estimates, thus surveys make up the foundation of a methodology which can lead to changes in policymaking, welfare allocation and strategy. Restoring contaminated marine sediments is a priority in the Norwegian environmental policy, usually put out through dredging or capping. The credibility and validity of the SP surveys are hence crucial to a nation’s policy on natural resource and environmental economics, which is what this thesis aims to investigate.

## 1.2 Research questions

The subject of this thesis is based on a survey conducted by Menon Economics and DNV GL in 2018, ordered by The Norwegian Coastal Administration. The purpose of the survey was to eventually estimate the economic gain residents receive from restoring contaminated marine sediments. The enhanced condition of the sediments could lead to a higher perception of people’s welfare in terms of both non-use and use values, such as impacts on biodiversity and endangered species and foraging. Mended sediments indicate improved living conditions for life in the ocean. Affected species include the organisms living in and on the sediments and their predators upwards the ecological food-web with scavenging seabirds and humans on top.

The survey estimated households WTP to restore contaminated marine sediments in their local harbour. To estimate the welfare benefit gained by the ecological restoration, we use the stated preference (SP) method contingent valuation (CV). The main objective of the thesis is to evaluate the validity of using CV for valuing clean-up of contaminated marine sediments and test whether WTP for cleaning up contaminated marine sediments depend on how the survey respondents were recruited. The survey was conducted by two survey agencies, Kantar and Norstat, both performed through internet

surveys. A share of the panelists also answered the survey via SMS, managed by Kantar.

The dataset consists of answers from 2681 respondents, representing the municipalities Horten, Moss, Stavanger, Bodø and Ålesund. The questionnaires were constructed equally for the five local municipalities' cases, though the scope of area, the degree of pollution and environmental damage, somewhat fluctuate. Kantar and Norstat are professional survey agencies with a pre-recruited base of respondents who have accepted answering surveys on various topics, typically within market research. As both agencies had limited access to relevant respondents to meet the standards of a sufficient data sample, hence a valid estimate of WTP, it was required to hire both agencies. Kantar and Norstat both sent the survey to their access panels online, whereas Kantar also contacted additional respondents in their phone-base through text messaging (SMS). Kantar and Norstat offer similar services, alas the assumption is that the output from their respondents ought to be equivalent. The first research question to shed light on this hypothesis is:

**Research question 1:** What is the effect on the composition of the sample when combining two access panels and SMS-recruitment?

Even when survey agencies are employed to collect the same data from a representative sample, they tend to provide dissimilar output. Kantar and Norstat have slightly deviating procedures when recruiting survey respondents. Both access panels consist of pre-recruited individuals of 15 years and older, willing to participate in variously themed surveys. Neither of the agencies offer self-recruitment by participants as they are entirely enlisted through direct contact, initiated by the agency. However, Kantar promote their implementation of ISO26362, a defined compliance related to recruiting and organizing. Whether Norstat follow the same set of procedures remain unknown. The stated preference method applied in the survey was contingent valuation. Johnston et al. (2017) summarize the theory of stated preference and review the main differences between contingent valuation and discrete choice experiments in estimating both use, and non-use values. The final research question is:

**Research question 2:** Does respondents' recruitment method affect WTP for clean-up of contaminated marine sediments?

TABLE 1.1 RESEARCH QUESTIONS

Research Questions
Research question 1: What is the effect on the composition of the sample when combining two access panels and SMS-recruitment?
Research question 2: Does respondents' recruitment method affect WTP for clean-up of contaminated marine sediments?

## 2 Theory

### 2.1 Monetizing Ecosystem Services

There seems to be an aggregated concern in monetizing the value of nature's goods and services (Gómez-Baggethun, de Groot, Lomas, & Montes, 2010). Capital is a common global language spoken in every nation, thus converting the worth of nature's goods and services into monetary value is reasonable if the ambition is to save, or in fact invest in, nature. Converting nature into monetary value is not necessarily a straightforward process as there is more to nature than what is tangible thus vendible. Certain commodities can be purchased or exchanged such as timber, fish, and oil. Other features presented by nature are its services. The commodification has contributed to increased attention and amplified political support concerning restoration and conservation. Ecosystem services (ES) are generally defined as goods and services that are of value to people, provided wholly or in part by ecosystems (Olander et al., 2018). The term ES was highly promoted after the Millennium Ecosystem Assessment (MEA) in 2005, which was a global study performed by 1400 scientists. The assessment concluded there was need of more knowledge, The Economics of Ecosystem services and Biodiversity (TEEB) was initiated shortly after. TEEB aimed to make nature's contribution to humans less concealed in global economy. One of the key aspects was the invisibility of nature in decision- and policy making processes and how legally inferior nature is as the market based economy does not incorporate nor value ecosystem services.

We value what we know, thus more knowledge on nature is therefore needed to avoid or mitigate further destruction. Sufficient commodification allows for a fuller perspective. That's where non-market valuation comes in, where economists have constructed a tool using theoretical disciplines to value services and goods provided by the environment and nature. By mapping people's willingness to pay (WTP) one can get an idea of what nature is worth to people.

### 2.2 Non-market valuation

Several ecosystem services are frequently referred to as non-market values, implied that they are not traded in the traditional sense through a market with a fixed price. Still, they provide humans with essential advantages which can be monetized. Consequently, they consist of non-market values (Heal et al., 2005). The Norwegian coastal areas provide several ecosystem services. Altering the conditions of polluted marine sediments in these areas will change humans' conception of their welfare related to the services provided there. The valuation is based on a Total Economic Value framework,

clarified in chapter 2.2.1. The economic approach to valuation incorporates individuals' perception of environmental goods and ecosystem services through hypothetical economic losses and gains. To estimate the impacts of changes in ecosystem services on the welfare of individuals, a reference value is required. In the case of the polluted marine sediments, the reference value is the current condition, encompassing the heavy metals and environmental pollutants. If the changes from the reference point result in individuals feeling a 'loss' it would be relevant studying how significantly the individual would value their economic loss and potentially compensate thereafter through their willingness to accept (WTA).

As the polluted sediments are undergoing an indisputably positive adjustment compared to the current condition, hence the reference point, the outcome would be contradictory to the mentioned loss. The individuals will experience a value gain and therefore estimating their willingness to pay (WTP). The principle of this approach to valuation is to estimate individual values as subtractions from, or additions to income that leave them equally economically satisfied regardless of the potential change in the ecosystem service.

### 2.2.1 Total Economic Value

The concept of total economic value (TEV) is a common method used to estimate biodiversity, environmental goods, and ecosystem services in monetary terms. TEV quantification has been described in Kumar, United Nations Environment, The Economics of, and Biodiversity (2010) and De Groot, Alkemade, Braat, Hein, and Willemen (2010) and utilized in wide range of ecosystem service accumulation studies such as Chen et al. (2019), D. N. Barton (2012) and Immerzeel, Vermaat, Riise, Juutinen, and Futter (2021). This approach aims to incorporate all the various aspects of ecosystem services, including the services not generally quantified in economic analysis, such as bequest- and existence value. By integrating all the values provided by ecosystem services into TEV, hence converting them into monetary terms the relative value of different services can be analyzed in a transparent matter. The Total Economic Value of a natural resource equals the discounted value of all future benefits derived from the same resource.

Total Economic Value are generally divided into two main segments, Use- and Non-Use Values. The Use Values refer to those values associated with current or future (potential) use of an environmental resource by an individual, whilst Non-Use Values define the continued existence of the resource and are unrelated to use (Heal et al., 2005). Use Value distinguishes between Direct Use and Indirect Use where the latter entail values such as Bequest Value and Existence Value. Bequest value is the composed value for the current generation knowing that future generations will have access to the same biodiversity and ecosystem services as themselves. This is determined by a belief that one should leave common goods such as nature and the environment in the same, or better, condition than what it was before – preserving the commodities for the future generations. Existence value is simply the benefit of knowing that part of nature exists. For example, the Amazon rainforest or Lofoten islands, individuals would feel a loss

if they were to disappear, without using the goods themselves. These values are commonly defined and measured through the method of Contingent Valuation, more information can be found in chapter 2.2.4. TEV is an anthropocentric value concept and does not include pure intrinsic values. Within the TEV framework, one individual can hold both use- and non-use values for the amenities from the same ecosystem (service).

### 2.2.2 Willingness to Pay

To measure individuals experienced welfare there are two concepts commonly used in economics, Willingness to Pay (WTP) and Willingness to Accept (WTA). WTP symbolize the maximum amount the respondent is willing to pay for a good or service and imply the consumer's valuation. Restoring contaminated marine sediments are perceived as a positive improvement, consequently the correct use of the welfare measurements is the WTP, also referred to as the compensating surplus. In this thesis, WTP indicate the highest expanse respondents are willing to pay to *improve* contaminated sediments, thus not obtaining a good, merely mend the ecosystem functioning and -services. The estimated WTP will therefore represent how much the restoration of contaminated marine sediments in five municipalities are worth to the Norwegian population.

WTP is determined by numerous elements, observably income regulate how much individuals are credibly capable to pay, but knowledge, interest and experience also influence the chosen sum significantly (Turpie, 2003). Other important indicators are socioeconomic factors such as gender, level of education and age.

### 2.2.3 Stated preference

Stated preference (SP) studies are frequently used in non-market valuation where the respondents claim their preferences related to specific subjects (Johnston et al., 2017). SP studies is a tool for researchers to estimate individual's utility for goods and services, often environmental alterations. The techniques are applicable in measuring direct use values, option values, bequest values and existence values (Barton et al., 2017)

The studies are achieved through surveys where the responses are the foundation of valuations. The survey consists of a detailed description of the object or the adjustment, how it will be achieved and provided, and method and frequency of payment are typically stressed. The topic of interest is thoroughly highlighted to assist the respondents in making completely informed choices. The answers are never superior to the survey, consequently there is a high demand for quality in plain language, linguistics, layout, and objective information. The questions are constricted to elicit respondents' WTP and can be obtainable through several techniques. Most common techniques are choice experiments, choice modelling and contingent valuation (CV). SP studies and the CV method is extensively used in non-market valuation due to the excessive potential to utilize the results, such as benefit transfer.

SP studies comprise demographic and socioeconomic information on the respondents which can influence the answers. This information can contribute in reveal inconsistencies or patterns in the sample as

well as support the researchers in evaluating validity or true response mechanisms (Champ, Boyle, Brown, & Peterson, 2003).

#### 2.2.4 Contingent valuation

When investigating a populations' utility of environmental goods such as ES through CV method, it is crucial that the sample is representative (Boyle, 2017). The purpose is to reveal the sample's preferences for the good, usually implemented by designing a hypothetically market for the good through detailed and distinct questions exposing their WTP. The three general fragments of the CV survey is the 1) comprehensive information on the subject and description of how the adjustment is obtainable to the respondent, 2) an objective presentation of the payment card and the potential budget restraints and 3) demographic characteristics of the respondents, subject related preferences and a test of cognitive abilities.

Johnston et al. (2017), Venkatachalam (2004), Dissanayake (2018) and Dunford et al. (2017) have postulated guidelines for the optimization of the technique. The general recommendation is to openly inform the respondents about the subject being valued, introduce the payment card synchronically with the payment method. The payment scenario should not be unfamiliar to the respondent, typically it is introduced as an annual or one-time tax. The subject and the related questions in the CV survey should appear realistic and relatable to the respondent in order to increase the chance of true value of WTP.

### 2.3 Contaminated marine sediments

Sediments are the results of continuously erosion, evolving and adaption of river basins, ice sheet and watersheds through the natural landscape. Whilst the water is eroding the grounds and forming geological landscapes, the degradation of soils creates excess building blocks constructing aquatic habitats. Natural sediments can consist of redundant bedrock, soil or biological matter and are transported by wind, water, or ice. The morphology and solidity differ due to the origin of the matter, the handling of transportation, the process of weathering and potential changes after deposition and weathering. Fluctuations in sediment distribution such as transport, erosion, distribution, and deposition are key to ecosystems such as river deltas, coastal marine areas, lakes and ponds. The extent of the sediment capacity transported by and through the rivers have vital consequences for the functioning of the system, for instance through the role it plays on water quality, the building of water morphology, the material fluxes and aquatic habitats and its surroundings (Cullmann, 2015).

Sediments in an aquatic ecosystem is the reverse result of the soil in the terrestrial ecosystems, as they are the recipient of substrate nutrients and micro- and macroflora that make up the foundation of living aquatic resources. Sediments are essential to

environmental nutrient cycles and the implementation of water quality. Sedimentation in aquatic ecosystems are derived from and composed of natural physical, chemical and biological components related to their watersheds (GESAMP, 2001).

Loose deposits such as gravel, sand and silt on the ocean floor or coastal areas often consists of terrestrial sediments transported into the sea by wind, water, or ice. Marine sediments also contain a multitude of organic matter such as degraded primary producers and skeletons. Due to tidal water, undertow and currents, most of the finer and therefore lighter materials are transported into the sea floor, leaving the coastal areas with the coarsest remains. Shallow sea bottoms of 10 meters and less have a relative high deposition rate, especially regions connected to river basins where the freshwater sinks to the bottom, leaving mobile sediments behind. The river mound can result in a deposition rate as high as several tens of centimetres each year compared to the deposition rate of a centimetre a decade on floors reaching

Norway has the world's second longest coast-line, since the founding of the State Port Authority in 1841 there has been established more than 800 fishing ports and more than 60 major transportation ports (Kystverket, 2016). After decades of heavy pollution from industry, transport, and sewer many of the harbor's sediments are profoundly contaminated (Miljøverndepartementet, 2002). The marine contaminated sediments along the coast cause trouble to several commercial interests. Not only to the commercial fishing and aquaculture industry, but it mitigates the value of the surrounding area in terms of tourism and recreation (Miljøverndepartementet, 2002).

## 2.4 Study area, Horten harbor as case

Horten is an industrial municipality located in the south-east of Norway, in the Vestfold and Telemark County along the Oslo fjord. Traces of settlements known as Borrehaugene, dating back to the Stone Age, testifies that the area was center of power in the Viking Age. The formation of the town was later accelerated as a result of the naval base and shipyard Karljohansvern, operating from 1820 until 1968 (Rabbevåg, 2021). The shipyard converted into the civilian enterprise Horten Verft A/S as the Royal Norwegian Navy moved its main operations (Berg, 2017). Horten Verft was the industrial foundation in the community of Horten until it went bankrupt in 1987, the area has altered into a business- and industrial hub consisting of approximately 50 companies. Horten is connected to Moss across the fjord with the Moss-Horten ferry which yearly transfer 600.000 vehicles and over 3 million people back and forth. After 150 years as a functional dock, the Horten harbor has received tons of waste and pollution from the industry and local inhabitants as well as wastewater and ballast water from shipping. Several thorough investigations of the sediments confirm a high degree of heavy metals like mercury, lead, chromium, and cadmium as well as environmental toxins like PCB-7, TBT and PAH-16. The risk assessment for this specific situation, created in line with the Norwegian Environment Agency (NEA) guidelines (Miljødirektoratet,

2015) is a conservative measure. The polluted sediments can cause distress to a multitude of aspects, but the key elements pointed out by the guidelines are:

- Possible risk of leakage of environmental toxins from sediments to water masses through movement caused by for example boats and industry.
- Possible risk to human general wellbeing and health through exposure to polluted fish and seafood
- Possible risk of affecting the ecosystem.

The latter is of least concern as analyses conclude that fish from Horten harbor give no purpose to alert the public or change current dietary advice (COWI, 2013). Sediment extractions from the inner harbour of Horten confirm natural rehabilitation in most of the areas. The seabed restore itself slowly, but not in a satisfying timing to maintain the goal of the Water Framework Directive of “good” chemical and biological standards by 2027, thus rapid measures are required.

Recommended procedures are a combination of limited dredging and deposition of sediments to maintain sailing depth in certain areas and covering other areas with erosion protection. The sailing depth required in Horten is three metres though currently some areas are too shallow. The seabed is suggested removed by dredging and deposited in an approved treatment plant. Dredging sediments are generally more costly than covering them as the environmental responsibilities of safely removing, transporting, and storing the pollutants, requires far more phases than simply concealing them. By covering the seabed, the benthic fauna and water body are isolated from the continuously leakage of heavy metals and environmental pollutants. The hiding also prevents spreading through turbulence and leakage of toxins from pore water. Thickness of coverage differs between the areas, the most toxic areas will require a layer of 45 centimetres, whilst the least harmful ones can suffice with 20 centimetres NGI (2016).

## 2.5 Survey methodology

As the access to internet availability grew globally, the survey methodology relocated from face-to-face, via telephone to mostly internet interviews and questionnaires. Numerous studies has been executed on the subject of altered methodology, one of the many advantageous findings being increasing democratization of research due to the less costly procedures (Frippiat, Marquis, & Wiles-Portier, 2010). As researchers are less reliant on funding to perform the actual data gathering, they also save costs on the time spent on the surveys. Internet based surveys can take considerable less time to administer compared to face-to-face surveys (Schaefer & Dillman, 1998). Collecting and administrating data gained through face-to-face interviews generally take up months of researchers' budgets. More specifically, Geert and Nathalie (2008) completed 980 questionnaires in four months, whilst finalizing over the threefold (3235) in a single month through internet-based questionnaires. Almost half of the recipients responded and completed within the

very same day of obtaining the survey. Performing data collection through internet surveys also imply researchers gaining access to hitherto inaccessible groups of interviewees through various search engines and virtual communities (Frippiat et al., 2010).

Mitigating a biased survey sample is a major issue as it will influence the output and thus represent a restricted model of the population. An anticipated finding is that people most liable to participate in and complete the surveys are already interested in the subject, implicating a major research bias. When the subject is completing or even partaking in the survey due to a personal interest, the missing data due to non-response can no longer be regarded as a random factor, the participation is depending on the very subject that is being examined. One way to tackle the bias is integrating one or several control questions in the survey, directly reporting on the subject or closely related matter, such as political beliefs. It turns out that some people tend to suffer from the primacy effect, through monitoring the respondent's eye-movements Galesic, Tourangeau, Couper, and Conrad (2008) found that most cases strategically clicked the first out of several alternatives. These findings give reason to believe that options listed at the top are selected more often, not necessarily due to the respondent's actual preference on the subject, merely as a means to speed through the survey.

Anduiza and Galais (2017) examine respondents answering without reading and investigate including instructional manipulation checks (IMC's) in the surveys. Respondents have various motives for answering surveys, some have intrinsic motives, others monetary incentives. Satisficers are a group of people who are sufficiently satisfied making rapid choices rather than optimizers who will spend long time assessing their decisions. The term 'satisficers' was coined by the economist, political scientist, cognitive psychologist and Nobel laureate Herbert A. Simon in 1957. As optimizing each answer in a questionnaire requires cognitive work, some respondents will become satisficers to minimize the burden (Simon, 1957). Oppenheimer, Meyvis, and Davidenko (2009) introduced instructional manipulation checks (IMC's) to surveys, stimulating differentiating the various panelist types. Separating the ones speeding through the task from the ones taking their time, wanting to contribute, or being called on again. IMC's can be used as a tool to figure out if panelists are answering irrationally, lack of attention or inconsistent answers, taking their time, reading consciously or simply pushing buttons as they go, either because they don't care, loose concentration, just want the prize at the end or don't understand the question at stake. One specific method used to discover or exclude the satisficers are to introduce a test in the survey known as the 'blue-dot task' where the respondent is met with several large blue dots placed on a scale with a text stating something similar to 'very rarely' and 'very frequently' on either side. In addition to the dots, there is a sentence explaining that one should ignore the blue dots and instead click on a particular item on the page. Oppenheimer et al. (2009) describes that a large portion of their survey sample fail this certain task.

Distractions are concerning in survey methodology due to particularly two effects: 1) distractions can prolong the total time spent answering the survey, hence increasing costs and 2) distractions can deteriorate the quality of the response (Ansolabehere & Schaffner, 2015). Longer surveys mean more people will be distracted, in a 10-minute survey between 63 and 72 per cent of respondents did not experience or seek out distractions, whilst when survey is prolonged to 27 and 36 median minutes, half of respondents report at least one distraction. Individuals pursuing surveys on their smart phones are much more prone to distractions than the ones engaging through a desktop computer. The more cognitive effort the survey requires, the more likely distractions will occur. Consequences of distractions are probably most important. During a 20 minutes span, respondents are expected to experience one interruption, adding 4-5 minutes to the completion time. However, there are no clear evidence that distractions degrade the quality of response (Ansolabehere & Schaffner, 2015). Respondents reporting at least one distraction were no less consistent in how they answered two identical surveys. Also, no less likely to answer factual questions correctly. On the contrary, researchers and others construction surveys should be more concerned with respondents rushing through surveys rather than the ones using extra time. Jones, House, and Gao (2015) observe that about 16 percent of respondents were fraudulent or inattentive in a web panel survey experiment, and Miller (2006) finds that as many as 25 percent of survey respondents engaged in one or more of those behaviors across multiple online panels. Incentives are a widely used tool to attract participants to online panels and encourage them to participate in surveys. Typically, incentives are awarded to web panel participants upon completion of a web survey, though sometimes they are partially awarded when a respondent starts a survey. The participation grant is typically tied to the length of the survey, the incidence of respondents eligible to participate, and the difficulty in finding respondents that meet other screening criteria, such as age or gender. The value of the incentive may also be set arbitrarily by the investigator based on their budget.

Reward before completing survey, engaging more respondents? However, will engage disinterested cases. The impact of incentives on data quality is a significant concern of web panel survey investigators who motivate respondents to complete surveys for rewards (Baker et al., 2010). The effects of increased financial incentives on respondent behavior are theoretically ambiguous (Singer & Ye, 2013; Toepoel, 2012). A rational choice perspective suggests that a higher value incentive increases the benefit of completing a survey, drawing in additional respondents that are otherwise disinterested in participating. Those marginal respondents may be unmotivated to carefully process and respond to survey items, seeking instead to complete the survey as efficiently as possible to earn the reward (Barge & Gehlbach, 2012). Conversely, increased incentives could facilitate respondents to process and answer survey items more

carefully by instilling a desire reciprocate for the reward (Gouldner, 1960). Spreen, House, and Gao (2019) investigated response behavior and response quality in internet surveys related to fluctuating participatory rewards. Overall, the results suggest increased contingent incentives yield limited improvements in the behavior of web panel respondents.

### 3 Data and empirical strategy

The groundwork of this thesis is a report based on a survey carried out by Menon Economics and DNV GL for the Norwegian Coastal Administration and the Norwegian Environment Agency (Lindhjem, 2020). The data collection took place in 2019, from May until December after a long period of planning, starting from 2016. The complete survey can be found in the appendix.

#### 3.1 Data collection

The data collection was performed by the survey agency Kantar. The survey was sent to members of their access panel, but as the number of qualified members within the specific geographically regions were insufficient, Kantar collaborated with another survey agency, Norstat. Both agencies sent the survey to their respective access panels and Kantar also sent an invitation to the survey via SMS to their phone pool. The survey consists of 61 questions, including figures, pictures and sliding scales.

#### 3.2 Survey design

The questionnaire starts with enquiries related to respondent’s attitude towards different political matters, where they are asked to share their personal opinions. These issues are for instance “school and education”, “prevention of oil spill”, “road development and infrastructure” and “restoring contaminated marine sediments”. The purpose of enhancing these issues is to remind the respondent of the many public goods allocated by the nation’s budget.



FIGURE 3.1 HOW SIGNIFICANT OR INSIGNIFICANT DO YOU FIND THESE POLITICAL ISSUES?

The next section of the survey describes the concern with contaminated sediments, after asking the respondent about their

knowledge about distinctive subjects, such as heavy metals and environmental pollutants.



FIGURE 3.2 ENVIRONMENTAL TOXINS AGGREGATE UPWARDS THE FOOD CHAIN

The next segment of the survey is dedicated to the respondent's local conditions and the qualities of the specific harbor. The questions include illustrated maps and elaborated information on the environmental situation. To demonstrate the potential consequences from having contaminated marine sediments at the individual waterfront, the respondents are presented with an illustrated matrix. The matrix exhibit three categories affected by the contaminants, specifically "life in the ocean", "endangered species" and "foraging". These categories are organized in a chronological order, from red, orange, yellow to green, representing the clusters "very large environmental damage", "large environmental damage", "moderate environmental damage" and "no environmental damage", respectively. The matrix provides descriptions of the various degree of damage on the particular category.

### Miljøskader i Aspevågen i Ålesund med og uten tiltak

Tabellen nedenfor viser fire nivåer for miljøskade i norske havner. Miljøskadene kan variere fra svært stor miljøskade (rød farge) til ingen miljøskade (grønn farge).

I Aspevågen vil en uten tiltak få svært stor miljøskade i den røde delen av havnen siden hele havnen er farget rødt (som vist i kartet i tidligere skjembilde).

Ved mer omfattende tiltak som enten fjerner eller dekker til miljøgiftene er det på kort sikt mulig å oppnå ingen miljøskade (grønt nivå). Men på grunn av gradvis tilførsel av ny forurensning, som det er vanskelig å gjøre noe med i byområder, vil en på lang sikt trolig uansett få moderat miljøskade (gult nivå) i hele eller deler av tiltaksområdet. Merk at selve vannkvaliteten forblir god og uendret som følge av tiltak. Badning, friluftsliv og fritidsfiske påvirkes ikke. Gyteområder for fisk påvirkes heller ikke. Av de ulike artene i området er det dem som lever i og nær sjøbunnen som påvirkes mest.

Vi skal bruke den samme skadetabellen i de neste spørsmålene. Ta deg god tid til å se på den.

Konsekvenskategori	Svært stor miljøskade	Stor miljøskade	Moderat miljøskade	Ingen miljøskade
<b>Liv i sjøen</b> 	Svært store negative effekter for dyr og planter som lever på bunnen og for fisk.	Store negative effekter for dyr og planter som lever på bunnen og for fisk.	Moderate negative effekter for dyr og planter som lever på bunnen og for fisk.	Ingen negative effekter for dyr og planter som lever på bunnen og for fisk.
<b>Truede arter</b> 	Svært store negative effekter på truede og sårbare arter, f.eks. krykkje, ærfugl og dvergdykker.	Store negative effekter på truede og sårbare arter, f.eks. krykkje, ærfugl og dvergdykker.	Moderate negative effekter på truede og sårbare arter, f.eks. krykkje, ærfugl og dvergdykker.	Ingen effekter på truede og sårbare arter.
<b>Matinntak</b> 	Skalldyr <b>bør ikke</b> spises (føre-var prinsippet). Lokal fisk vil kunne ha advarsel mot konsum.	Skalldyr <b>bør ikke</b> spises (føre-var prinsippet). Lokal fisk vil kunne ha advarsel mot konsum.	Skalldyr <b>kan</b> spises unntaksvis. Lokal fisk vil unntaksvis kunne ha advarsel mot konsum.	Skalldyr <b>kan</b> spises. Lokal fisk vil normalt ikke ha advarsel mot konsum.

FIGURE 3.3 ENVIRONMENTAL DAMAGE IN ASPEVÅGEN ÅLESUND, WITH AND WITHOUT FURTHER MEASURES AND THEIR CORRESPONDING CATEGORIES

The matrix is imperative to the survey, as all the questions involving WTP utilize this color scheme.

Further, the respondents are presented to several scenarios with various degrees of environmental damage, the most important ones simply referred to as the slightest and greatest improvements.

Tiltaksområde	Størrelse på areal (m <sup>2</sup> )	Uten tiltak	Med tiltak
A	123 000 m <sup>2</sup>		→ 
A	123 000 m <sup>2</sup>		→ 
A + B	443 000 m <sup>2</sup>		→ 
A + B	443 000 m <sup>2</sup>		→ 

FIGURE 3.4 SCENARIOS FROM SLIGHTEST TO GREATEST IMPROVEMENTS IN HORTEN HARBOR

### 3.3 Questions determining WTP

The survey declares that the respondent's WTP will be structured as a single designated household municipal lump sum. The tax will be solely used to restore the specific local contaminated marine sediments. Respondents are reminded that higher taxes involve a fraction of their household budget, indicating less liquidity in the following year. A common issue in CV studies is that certain respondents are triggered when proposing household taxes as a resolution to common issues or substituting public goods (Boyle, 2017; Johnston et al., 2017). Respondents occasionally react by protesting to the tax claim by submitting WTP equals zero, so-called protest answers.

Hva er det verdt for deg og din husholdning å få en forbedring i del A av havnen, fra svært stor til moderat miljøskade (fra rødt til gult), som vist på kartene?

Marker på skalaen nedenfor det meste, om noe, husholdningen din helt sikkert er villig til å betale i en øremerket kommunal engangsvgift for tiltak som vil gi en slik miljøforbedring fra rød til gul i del A av havnen. Husk at del B av havnen forblir som i dag med stor miljøskade (oransje) og resten av indre havn forblir stort sett på grønt nivå (ingen miljøskade).

Husk også på at dersom husholdningen din betaler for dette har dere mindre penger å bruke på andre ting.

Du vil i de neste skjermbildene etter tur bli spurt om de større tiltakene i areal A og i begge arealene A og B samlet. Beløpet du eventuelt oppgir for hvert nytt tiltak vil komme istedenfor det du oppga for tidligere tiltak.

Klikk på markøren og trekk den til det høyeste beløpet du er villig til å betale

Engangsbeløp i kroner:

FIGURE 3.5 PAYMENT CARD WHERE RESPONDENTS SELECT HOUSEHOLD WTP AS A ONE-TIME TAX IN A CLEAN-UP SCENARIO IN HORTEN HARBOR

The indicator in the payment card, or “glider”, is mobile and allows the respondent to select their preferred household WTP, ranging from “zero” to “more than 12.000” NOK, as well as the option “don’t know”.

The survey will lead the respondent in different directions depending on their answer. For example, if the chosen household WTP in a clean-up scenario is “more than 12.000” NOK, the respondent is asked to specify which amount happens to be their accurate household WTP. The options “0” and “don’t know” will result in the follow-up question “What is the main reason you chose “0” / “don’t know” in the previous WTP-question?” where they could choose one out of 18 options.

Du svarte mer enn 12 000 kr på forrige spørsmål.

Vennligst spesifiser nøyaktig beløp her

FIGURE 3.6 PLEASE SPECIFY HOUSEHOLD WTP > 12.000

Every new scenario's preferred WTP replace the identified WTP in the previous scenario. Figure 3.4 demonstrate how the newest presented

scenario encompass the previous and is therefore more comprehensive as it incorporate the previous scenario.

### 3.4 Socioeconomic indicators

In order to reveal patterns in WTP and characteristics about the respondents, the survey's concluding section involve personal questions, such as age, occupation, gender, level of education and income. These answers are fundamental in exposing the sample representation and can support related economic theory in the validity assessment.

Some background information on the respondent's relation to the focus area was also collected. The respondents were asked whether they were members of an environmental organization, if and what party they voted for during the last election, if and in case how many times they had spent time in the harbor area the previous 12 months. The respondents were asked to share how many times they had visited the geographical area incorporating the local harbor during their sparetime in the past 12 months. Example from Ålesund presented in Figure 3.7.

Hvor ofte har du foretatt fritidsaktiviteter ved Aspevågen i Ålesund de siste 12 månedene? Det kan for eksempel være båtturer, fiske, bading, spasering langs havnen eller andre aktiviteter i havneområdet. Tell alle aktiviteter som varte mer enn 1 time per dag som 1 dag.

Ikke i det hele tatt
Én gang (1 dag)
2-12 dager
13-24 dager
25 dager eller mer
Vet ikke

FIGURE 3.7 TIME SPENT IN HARBOR AREA OUTSIDE WORK, EXAMPLE FROM ÅLESUND SURVEY

The respondent was asked to select their main reason to participate in surveys, presented in Figure 3.8.

Hva er din hovedmotivasjon for å være medlem i paneler for spørreundersøkelser?  
Velg ett av alternativene

Jeg synes det er morsomt å svare på spørreundersøkelser
Jeg mener det er viktig å svare på spørreundersøkelser som kan gi bedre produkter for oss forbrukere
Jeg mener det er viktig å svare på spørreundersøkelser som et bidrag til samfunnet
Tjene poeng som jeg kan donere til ulike formål
Tjene poeng som jeg kan kjøpe varer for
Annet, vennligst spesifiser:
_____
Vet ikke / vil ikke oppgi

FIGURE 3.8 MAIN MOTIVATION TO PARTICIPATE IN SURVEY(S)

## 3.5 Data processing

### 3.5.1 Detecting protest answers

When performing an interval regression, it is important to establish how to administer WTP answers such as “0” and “don’t know”. Some respondents select  $WTP = 0$  due to true zero added utility of the question at stake, which is acceptable. Other respondents are triggered by some component of the survey, in example the suggestion of increased taxes, they end up selecting  $WTP < 1$ , implying that they gain no utility from the sediment restoration. This will affect true average WTP and result in a diminished result. Protesters are recognized by claiming zero WTP caused by aggravation from proposed taxes, contrafactual to actual zero utility. To detect protesters, the respondents are asked to specify their reasoning, see Figure 3.9.

Du har ovenfor sagt at du, eller husholdningen din, ikke er villig til å betale noe for opprydding av forurenset sjøbunn. Hva er den viktigste grunnen til at du og husholdningen din ikke vil betale? Merk den ene grunnen som var aller viktigst for deg/dere

Dagens innsats mot forurensning og rene havneområder er bra nok
En engangsvgift er urealistisk og/eller utilstrekkelig
Jeg føler det ikke er riktig å veie miljøet i penger
Må ryddes helt opp slik at det ikke blir noen miljøskade, ikke bare mindre tiltak
Jeg stoler ikke på at pengene vil gå til dette formålet
Jeg mener andre samfunnsoppgaver bør prioriteres først
Det er rent nok som det er i havna
Jeg ville betalt for tiltak i andre kyst- eller havneområder
Miljøforbedringen er liten
Området som ryddes opp er en liten del av havnen
Det er de som har sluppet ut miljøgiftene som må betale
Hva jeg sier vil ikke påvirke om tiltak blir gjennomført eller ikke
Jeg blir ikke påvirket av at det er forurenset sjøbunn i havneområdene i Bodø
Husholdningen min har ikke råd til å betale for dette
Skatter og avgifter er allerede høye nok
Jeg vil ikke betale før jeg vet hva det koster
Jeg tror ikke miljøskadene er så store
Annen årsak, vennligst spesifiser:
Usikker /Vet ikke

FIGURE 3.9 SELECT MAIN REASON FOR EXPRESSING HOUSEHOLD WTP=0

By making the respondents submit their reasoning, one can separate the protesters from respondents who cannot afford or experience true zero utility from the restoration.

Don't know-answers were coded as WTP=0.

### 3.5.2 Determining respondents WTP

When respondents were asked to report their WTP for clean-up scenarios with distinctive degrees of environmental damage, they could select between 25 options on the payment card, see Figure 3.5. The options consist of numbers from 0 till 12.000, as well as "more than 12.000" and "don't know". Between the available numeral options is an interval, expanding in extent in chronological order. The interval between the first options to the left are smaller than the ones further right. The lowest options have intervals ranging from 10 until 200 NOK, whilst the highest indicated options differentiate as much as 3500 NOK. As the data is in intervals, the selected amount is the lowest point on the interval. The true WTP exist between the lowest and highest amount within the indicated interval. If the respondent selected the WTP option "1500", the true WTP lie

somewhere between 1500 and the highest digit within the interval, in this example 1799. The true value is censored and therefore unknown, but is interpreted as the midpoint of the interval, although there is equal probability for all the digits within the interval.

## 3.6 Econometric model

In purpose of this thesis is to investigate the output of combining three recruitment methods in a CV survey regarding contaminated marine sediments in five Norwegian municipalities. One of the important factors is to examine the significant variables which explain some of the variation in the respondents' WTP.

### 3.6.1 Variables

The variables in my interval regression are presented in Table 3.1 with a brief description and expected hypothesis for their correlation to the dependent variable.

TABLE 3.1 REGRESSION VARIABLES

<i>Variable</i>	Description	Exp.
<i>lWTP_first_rev</i>	Logarithm of the lowest amount in the selected WTP-interval for the smallest measure (NOK)	
<i>lWTP_1_high</i>	Logarithm of the highest amount in the selected WTP-interval for the smallest measure (NOK)	
<i>lWTP_4_5_rev</i>	Logarithm of the lowest amount in the selected WTP-interval for the largest measure (NOK)	
<i>lWTP_4_5_high</i>	Logarithm of the highest amount in the selected WTP-interval for the largest measure (NOK)	
<i>Kantar</i>	Dummy, 1 if respondents was recruited through Kantar's acces panel, 0 otherwise	(+/-)
<i>SMS</i>	Dummy, 1 if respondents was recruited through Kantar's phone pool, 0 otherwise	(+/-)
<i>Norstat</i>	Dummy, 1 if respondents was recruited through Norstat's acces panel, 0 otherwise	(+/-)
<i>high_edu</i>	Dummy, 1 if respondent has completed higher education (3 > years at university), 0 otherwise	(+/-)
<i>lAge</i>	Logarithm of the age of respondent	(+/-)
<i>lhhincome</i>	Logarithm of midpoint of the annual household income for the respondent	(+)
<i>envorg</i>	Dummy, 1 if member of environmental organization, 0 otherwise	(+)
<i>female</i>	Dummy, 1 if female, 0 if male	(+/-)
<i>Motivasjon</i>	Dummy, 1 if respondent claimed financial incentive to participate in survey, 0 otherwise	(+/-)
<i>Fritid</i>	Dummy, 1 if respondent spent time at the local harbor the previous 12 months, 0 otherwise	(+)

There are four dependent variables in my regression, these are titled "lWTP\_first\_rev", "lWTP\_1\_high", "lWTP\_4\_5\_rev" and "lWTP\_4\_5\_high". They represent the logarithm of the lowest and highest value in the respondent's selected WTP-interval of the smallest and largest restoration scenario. The other variables are

independent and Table 3.1 explain most of them. The dummies “Motivasjon” and “Fritid” might need further explanation. The dummy “Motivasjon” was constructed in order to test if there is a relationship between respondents claiming to have a financial incentive to participate in surveys and WTP. Figure 3.8 present the options respondents could select from. The motives “Earn points in which I can purchase commodities with” and “Earn points in which I can donate to different charities” were coded as 1, the other options as 0. The dummy “Fritid” was created in order to test if there is a relationship between respondents’ utilization of the geographical area of the harbor and WTP. Figure 3.7 present the available options. The option “Not at all” and “Don’t know” were coded as 0, the other options as 1.

The payment scenario is introduced as a one-time tax and WTP is limited by an individual’s income. Therefore, I expect a positive relationship between the variable “lhhincome” and WTP. A high household income can potentially pay higher taxes. As the survey concerns environmental issues in terms of restoration of contaminated marine sediments, I assume there is a positive association between the variable “envorg” and WTP. A respondent who is a member of an environmental organization is likely to be concerned with environmental issues and therefore probably has a higher WTP for the clean-up scenario. If the respondent has spent time at the area at stake, they are liable to have an affective relationship to the geographical area of the harbor, therefore I assume a positive connection between “Fritid” and WTP. The association between the other variables and WTP is unknown, therefore I have no specific expectations relating their outcome.

### 3.6.2 Interval Regression

As the data from the CV answers are censored some modifications were in order. The data was in intervals, therefore the precise WTP is unknown to the observer. The lowest point of the interval is what the respondent chose, whilst the highest is placed right below the greater amount, not chosen. Stated preference studies find that the true value exists somewhere between the lowest and highest point in the interval. Although the probability for each amount within the interval is equal, the midpoint is generally most pragmatic.

Interval regressions accept two dependent variables, one representing the smallest digit and the other the highest in the interval. The average WTP was estimated by computing the mean of the midpoints of the respondents selected WTP-interval. The interval regression utilizes maximum likelihood estimators and the model can be expressed as:

$$y_i^* = x_i\beta + \epsilon_i, \epsilon_i | x_i \sim N(0, \sigma)$$

where  $y_i^*$  is the dependent variable representing the censored WTP value of respondent  $i$ .

The purpose of the regression is to explain the variation in WTP in two different restoration scenarios when combining respondents recruited in dissimilar ways. The smallest and largest restoration measures from the survey will be investigated further. The WTP for the largest restoration scenario should be higher than the smallest, as the scope of the geographical area is substantially larger than the smallest. In order to estimate variation in WTP a set of variables must be generated and included in the regression. First off, protest answers are the ones selecting WTP=0 whilst appearing to gain net utility from the restoration scenario. Protesters are generated as a dummy variable, where 1 equals protest and 0 equals otherwise. This dummy isolate protesters from true WTP=0, altering their responded zero into the individual mean WTP for each scenario. Otherwise, the mean WTP would appear underrated and probably further from the Norwegian populations' true WTP.

TABLE 3.2 INTERVAL REGRESSION MODEL EXPLAINING WHICH REGRESSION VARIABLES LEAD TO HIGHER AND LOWER HOUSEHOLD WTP. STANDARD ERRORS ARE IN THE PARENTHESIS, STARS INDICATE SIGNIFICANCE

	Small	Large	Small	Large
	Model 1	Model 2	Model 3	Model 4
<i>Kantar</i>	0,16 (0,12)	0,30 *** (0,12)	-0,12 (0,31)	0,04 (0,30)
<i>SMS</i>	0,28 (0,31)	0,26 (0,30)		
<i>Norstat</i>			-0,28 (0,31)	-0,26 (0,30)
<i>high_edu</i>	0,24 * (0,12)	0,37 *** (0,12)	0,24 * (0,12)	0,37 *** (0,12)
<i>lAge</i>	1,02 *** (0,19)	0,57 *** (0,18)	1,02 *** (0,19)	0,57 *** (0,18)
<i>lhhincome</i>	0,20 ** (0,10)	0,24 *** (0,93)	0,20 ** (0,10)	0,25 *** (0,09)
<i>envorg</i>	0,19 (0,15)	0,26 * (0,14)	0,19 (0,15)	0,26 * (0,14)
<i>female</i>	0,41 *** (0,12)	0,47 *** (0,12)	0,41 *** (0,12)	0,47 *** (0,12)
<i>Motivasjon</i>	0,06 (0,18)	0,15 (0,17)	0,06 (0,18)	0,15 (0,17)
<i>Fritid</i>	0,60 *** (0,12)	0,66 *** (0,11)	0,60 *** (0,12)	0,66 *** (0,11)
<i>Observations</i>	1 470	1 484	1 470	1 484
<i>Log likelihood</i>	-5789.17	-6051.59	-5789.17	-6051.59

\* $p \leq 0,10$ , \*\* $p \leq 0,05$ , \*\*\* $p \leq 0,01$

Table 3.2 present the interval regression. The coefficients are on top, the standard error is in parenthesis, whilst the stars indicate significance or p-value. Three stars indicate a p-value at 1%, two stars indicate a p-value at 5% whilst one star equals a p-value at 10%. The coefficient sign indicates positive or negative correlation between WTP and the independent variable. The positive coefficients indicate a positive relation indicate an increase in WTP per unit of the dependent variable. The negative coefficient indicates a negative correlation.

The interpretation of the regression output is done on the ceteris paribus principle, meaning that all other factors are held constant. Some examples of what can be interpreted from the regression follows. The output express that the variables “lAge”, “female” and “Fritid” have positive relationships with WTP in all the scenarios independent of the recruitment method. They are significant at a 1% level. This indicates that respondents who are either / or mature, female and have spent time in the harbor area tends to have a higher WTP for the restoration of contaminated marine sediments. The variable “high\_edu” is only significant at 10% in model 1 and 3, whilst 1% in model 2 and 4, indicating that higher education leads to a higher WTP in the largest measure than the smallest measure. “Motivasjon” is not significant, indicating that though the respondents have a financial incentive to answer surveys it does not affect their WTP. The variable “lhhincome” is significant at 1% in the largest measure, indicating that higher household income is associated with higher WTP. The recruitment methods are not significantly dissimilar.

## 4 Results and discussion

### 4.1 Descriptive Statistics

#### 4.1.1 Response characteristics

TABLE 4.1 RESPONSE RATE

	<i>Access panels</i>		<i>Phone base</i>	<i>Total</i>
<i>Invitations sent</i>	6.320		21.960	28.280
<i>Initiations</i>	4.813		2.482	7.295
<i>Complete surveys</i>	2.036		645	2.681
	<i>Kantar</i>	<i>Norstat</i>	<i>Kantar</i>	<i>Total</i>
	903	1033	645	2.681
<i>Response rate (%)</i>	42	33	24	

The total number of invitations sent out to participate in the survey was 28280, 21960 via SMS and 6320 through e-mail. The sum of individuals initiating the survey was 7295, 4813 from the access panels and 2482 from the phone base. Out of the latter, 645 individuals completed the full survey, whilst 2036 from the access panels completed, resulting in 2681 fully completed surveys. Out of

these respondents, 1033 originate from Norstat's access panel, 903 from Kantar's access panel, and 645 from Kantar's phone base, which quantity of 42%, 33% and 24% of the respondents respectively.

#### 4.1.2 Sample vs. Population characteristics

In order to investigate to what extent the sample is a decent representation, the socioeconomic features of the respondents are compared to the rest of the adult Norwegian population. The most relevant qualities are gender, household income, education, and age, as presented in Table 4.2 below.

<i>Sample Characteristics</i>	<i>Kantar (903)</i>	<i>SMS (645)</i>	<i>Norstat (1133)</i>	<i>Mean (2681)</i>	<i>Norwegian Population</i>
<b>Gender (%)</b>					
<i>Male</i>	0,575	0,568	0,527	0,553	0,503
<i>Female</i>	0,425	0,432	0,473	0,447	0,496
<b>Income (NOK)</b>					
<i>Mean household income</i>	966.269	930.113	908.525	933.629	832.700
<b>Education (%)</b>					
<i>High (&gt;3 years at university)</i>	0,599	0,534	0,586	0,578	0,353
<i>Low (elementary school, high school and vocational training)</i>	0,351	0,409	0,374	0,374	0,647
<i>Other</i>	0,049	0,055	0,039	0,046	n.a.
<b>Age (%)</b>					
<i>Mean age (years)</i>	57,4	47,8	50,5	52,1	48
<i>15-30</i>	0,06	0,15	0,14	0,11	0,195
<i>30-44</i>	0,14	0,24	0,23	0,2	0,2
<i>45-59</i>	0,3	0,31	0,28	0,3	0,2
<i>60+</i>	0,5	0,26	0,3	0,38	0,226

TABLE 4.2 SOCIOECONOMIC VARIABLES IN THE SURVEY SAMPLE COMPARED TO THE NORWEGIAN POPULATION

(SSB1, 2018; SSB2, 2018; SSB3, 2018; SSB4, 2018)

The gender distribution in the survey is slightly diverging from the Norwegian population, especially Kantar's access panel have a large proportion of male representatives. The mean gross household income in the sample is higher than the average income in Norway. The mean income in the sample is the midpoint of the income category picked by the respondent, which could explain the deviating income levels. There is a clear overrepresentation of individuals completed higher education in the survey. The mean age in the sample is similar to that of the Norwegian population. The sample indicate an overrepresentation of older people, especially Kantar's access panel has a high degree of respondents in the 60+ category. This summarize the information requested to answer research question 1: **What is the effect on the composition of the sample when combining two access panels and SMS-recruitment?** Compared to the Norwegian population aged 18 and over, the survey respondents appear to be relatively representative. Although the average reported household income is higher than the average Norwegian household income, there is no clear disparity between the three recruitment methods. The same is transferable to the characteristic's education level and gender distribution. The stated level of education is higher in the sample than what is true for the Norwegian population, and there is a higher share of male respondents than female compared to the actual population. This is transferable across all recruitment methods.

#### 4.1.3 Norstat's access panel respondents

Out of the 1033 candidates who completed the survey online from Norstat, the respondents age ranges from 18 till 89 years old. The mean age of the sample equals 50,46 years. There was a substantial variety in terms of level of education, as the largest group consists of individuals who completed a bachelor's degree (36,45%) followed by the ones finished high school (24,18%) and grad school (20,83%).

The largest group (14.03%) in the household income variable had between 800.000 and 1 million kroner in 2018 value kroner. 51.6% of the respondents had a shared household income between 400.000 and 1.2 million kroner.

#### 4.1.4 Kantar's access panel respondents

The age range in the Kantar survey resemble the Norstat sample. The youngest individual was 18 whilst the oldest was 89 years old. However, the mean age of the sample equals 57.39 years, 6.93 years older than the Norstat sample. In terms of education the largest group of the sample consists of the ones completed a bachelor's degree (36.10%), seconded by the master's degree (22.59%) and high school diplomas (18.56%).

The largest group (16.28%) in the household income variable was the same as in the Norstat sample, the shared household income between 800.000 and 1.2 million NOK. 54.8% had a shared household income between 400.000 and 1.2 million kroner.

#### 4.1.5 Kantar's SMS respondents

The mean age of the SMS respondents is 47,8 years, somewhat younger than in the other recruitment methods. The youngest respondent is 15

and the oldest 85 years old. The education is similarly distributed as the access panels, with 32% completed bachelor's degrees and 19% master's degree and 19% high school diplomas. The largest group in the household income variable is the interval of 600.000-800.000, however the mean household income is between the mean of the access panel's, of 930.000 NOK.

## 4.2 Protest answers

Figure 3.9 show the main reason for respondents choosing WTP=0. The specification gives the opportunity to separate true zero and protest zero. The answers "I do not believe that the marine sediment contaminants are severe" and "The marine sediments are fine as it is" are examples of alternative answers coded as true zero. The respondents express that they do not experience a utility from restoring the contaminated marine sediments. However, answers such as "Other issues should be prioritized first" or "The polluter must pay" show that the respondent could experience utility but for some reason protest the premise of the survey or the tax inductive. They are coded as protest answers and in the WTP calculation in STATA coded as "missing", or equal to mean. There was also an option to specify the reasoning behind WTP=0, which 81 respondents chose. These answers are coded individually, however end up in the same category of true or protest zero depending on their explanation. Table 4.3 show the frequency and percentage of protest answers by recruitment method.

TABLE 4.3 FREQUENCY AND PERCENTAGE OF PROTESTERS IN EACH SAMPLE

<i>Protesters</i>		<i>Kantar (903)</i>	<i>SMS (645)</i>	<i>Norstat (1133)</i>
<i>Smallest measure</i>	<i>Frequency</i>	108	52	110
	<i>Percent</i>	11.96	8.06	9.71
<i>Largest measure</i>	<i>Frequency</i>	97	62	103
	<i>Percent</i>	10.74	9.61	9.09

## 4.3 Willingness to Pay

Figure 4.1 and Table 4.4 display the WTP for the smallest and largest measures from the CV questions in the survey. The mean WTP increase with the size of measure, both Kantar, Norstat and the sample mean double the WTP for the large measure.

The protest answers have been separated from the calculation or labeled 'missing' in STATA. The answer "don't know" was coded as 0,

and the true  $\theta$  remained unaffected in the calculation. Respondents with a WTP above 12.000 NOK are asked to specify the amount. These answers are not converted into an interval, they are coded as true specific WTP.

TABLE 4.4 WTP FOR SMALL AND LARGE MEASURE BY RECRUITMENT METHOD

WTP (NOK)	Kantar	SMS	Norstat	Sample mean
Small	1034	875	899	937
Large	2258	1602	1850	1926

The digits represent the mean WTP by recruitment method. WTP is estimated by combining the lowest and highest points in the chosen interval, divided by two, which gives the midpoint. The respondents could choose amounts up to 12.000 NOK and if their WTP exceeded 12.000 they were asked to specify the amount. The highest WTP selected for the small measure was 20.000 and 25.000 in the largest. Kantar's access panel respondents have a higher WTP than the other recruitment methods.

The output presented in Table 3.2 and Table 4.4 enables solving research question 2, which was: **Does respondents' recruitment method affect WTP for clean-up of contaminated marine sediments?** The regression output indicates that being recruited through Kantar's and Norstat's access panels give no significant difference in WTP from the respondents recruited by SMS. This is applicable in both in the smallest and largest measure. This implies that the process of combining several survey agencies in order to obtain a representative sample from small municipalities do not affect the WTP.



FIGURE 4.1 WTP PER HOUSEHOLD AS ONE-TIME TAX FOR SMALLEST VS LARGEST RESTORATION MEASURE

## 4.4 Discussion

The respondents value the condition of their local harbor highly. Most respondents express a net utility gain from restoring contaminated marine sediments by selecting a WTP above zero. The interval regression output indicates a positive correlation between the variable household income and WTP, proving very high significance in the largest clean-up scenario. Respondents with higher household income show larger affinity towards a one-time tax assigned sediment restoration. The mean WTP for the largest measure is categorically higher than the smallest measure. The findings of correlation between household income and increasing WTP by the size of measure is supported by welfare theory and maximizing utility. Respondents are willing to pay more for bigger measures and higher household income provide additional prospects. The logarithmic age variable is significant at 1% in the largest clean-up scenarios in both models, and at 5% in the smallest. The coefficient is positive in all four models. Preferences might change with age, and here we see that household WTP for restoring contaminated sediments increase with age of the respondent. The age variable is both significant and positive. The recreational value of the harbor is significant and positive, proving that respondents who spend time in area have a greater affinity for restoration. These respondents indicate both use- and no-use value from the restoration project, notably higher than the respondents who do not use the harbor for recreational purpose.

Respondents with a higher education of at least a bachelor's degree have a positive correlation with WTP. The variable is significant at 1% in the largest measure in both model 2 and 4 and is significant at 5% in model 1 and 3. Thus household WTP increase with higher education. Higher education might indicate knowledge on contamination or other related environmental issues, and from the theory of stated preference and commodifying ecosystem services, we know that respondents value what they know and what is familiar (Chen et al., 2019; Johnston et al., 2017).

An unexpected finding, however, is how seemingly insignificant the variable of being member of an environmental organization is. The variable is significant only at 10% in model 2 and 4 with the largest measure but is insignificant in the smallest. The coefficient increases with the largest measure. Members of an environmental organization has significantly higher household WTP for the largest clean-up scenario than non-members, and that is as expected. Members of environmental organizations would probably be most interested in the largest sediment improvement, which could explain that in the smallest measure there is no significant relationship between household WTP and being member of an environmental organization.

The recruitment method seems significant at 1% in the biggest clean-up scenario with respondents from Kantar's access panel, in model 2. This model included the dummy variables Kantar and SMS, making

Norstat their reference value. The significance indicates that respondents from Kantar's access panel, compared to the reference value Norstat, select 0,3 higher household WTP. Neither of the other coefficients appear significant, in any scenario scope nor recruitment method. When comparing Norstat's and Kantar's access panels to the reference value of SMS in model 3 and 4, there is a negative correlation. Norstat's access panel appear to have 0,28 and 0,26 lower household WTP in the small and large restoration scenario respectively, compared to the SMS recruited respondents. Kantar's access panel have 0,12 lower household WTP in the smallest clean-up scenario and 0,04 higher WTP in the largest one when the SMS recruited respondents is the reference.

## 5 Conclusion

This study used contingent valuation to investigate the effects of combining different strategies to collect data for estimating Norwegians' willingness to pay for mending contaminated marine sediments in five municipalities. This was examined in an interval regression, using two dependent variables, the highest and lowest point of the selected WTP's interval. Answers from 2681 respondents from three recruitment processes were combined, representing Bodø, Horten, Moss, Stavanger and Ålesund. Three research questions was addressed. **Research question 1:** What is the effect on the composition of the sample when combining two access panels and SMS-recruitment? **Research question 2:** Does respondents' recruitment method affect WTP for clean-up of contaminated marine sediments?

**Research question 1:** Compared to the Norwegian population aged 18 and over, the survey respondents appear to be relatively representative. Although the average reported household income is higher than the average Norwegian household income, there is no clear disparity between the three recruitment methods. The same is transferable to the characteristics education level and gender distribution. The stated level of education is higher in the sample than what is true for the Norwegian population, and there is a higher share of male respondents than female compared to the actual population. This is transferable across all recruitment methods.

**Research question 2:** The regression output indicates that being recruited through Kantar's and Norstat's access panels give no significant difference in WTP from the respondents recruited by SMS. This is applicable in both in the smallest and largest measure. This implies that the process of combining several survey agencies in order to obtain a representative sample from small municipalities do not affect the WTP. Analyzing the regression output prove that we cannot conclude with a simple yes or no answer. There is no clear consistency in the variation in WTP between the three recruitment techniques and the household WTP is only significant in the largest scenario in Kantar's access panel. The analysis would be stronger if we knew more about how the survey agencies recruit and organize their panels.

The regression results were coherent with economic welfare theory as the estimated coefficients generally had the predictable signs. WTP increase simultaneous with aggregated scope of restoration and household income. The regression expresses that respondents who spend recreational time in the study area and / or are female and older, show the tendency of clear higher household WTP.

There is a consistently higher WTP for the most substantial clean-up scenario compared to the smallest, which is expected as the largest scenario encompass the smallest. Respondents are willing to pay more for more. Merging several recruitment methods appear applicable when having to combine two access panels and substitute respondents from a SMS campaign, the analysis would however be stronger if the recruitment process was more transparent. We do not know enough about how these panels are assembled in order to understand the true effects on WTP from combining them.

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## 7. Appendix

### 7.1 Survey example, Stavanger version

Test - v2  
Velkommen til denne undersøkelsen som handler om aktuelle samfunns spørsmål. Den tar ca 15 minutter å besvare, og du får 15 poeng.



Test - v2  
Hvor viktige eller uviktige synes du personlig disse samfunnsoppgavene er?

Skole og utdanning <span style="float: right;">1/6</span>					
Svært viktig	Ganske viktig	Verken viktig eller uviktig	Ganske uviktig	Ikke viktig i det hele tatt	Vet ikke



Test - v2  
Hvor viktige eller uviktige synes du personlig disse samfunnsoppgavene er?

Helsevesen og eldreomsorg <span style="float: right;">2/6</span>					
Svært viktig	Ganske viktig	Verken viktig eller uviktig	Ganske uviktig	Ikke viktig i det hele tatt	Vet ikke



Hvor viktige eller uviktige synes du personlig disse samfunnsoppgavene er?

Redusere utslipp av klimagasser

3/6

Svært viktig

Ganske viktig

Verken viktig eller  
uviktig

Ganske uviktig

Ikke viktig i det  
hele tatt

Vet ikke

NØRSK  
GALLUP

Hvor viktige eller uviktige synes du personlig disse samfunnsoppgavene er?

Tiltak for å rydde opp i forurenset sjøbunn

4/6

Svært viktig

Ganske viktig

Verken viktig eller  
uviktig

Ganske uviktig

Ikke viktig i det  
hele tatt

Vet ikke

NØRSK  
GALLUP

Hvor viktige eller uviktige synes du personlig disse samfunnsoppgavene er?

Tiltak for å unngå oljesøl fra skip

5/6

Svært viktig

Ganske viktig

Verken viktig eller  
uviktig

Ganske uviktig

Ikke viktig i det  
hele tatt

Vet ikke

NØRSK  
GALLUP

Hvor viktige eller uviktige synes du personlig disse samfunnsoppgavene er?

Veiutbygging

6/6

Svært viktig

Ganske viktig

Verken viktig eller  
uviktig

Ganske uviktig

Ikke viktig i det  
hele tatt

Vet ikke



NØRSK  
GALLUP

Denne undersøkelsen gjennomføres for Kystverket og Miljødirektoratet, og handler om tiltak for å rydde opp i forurenset sjøbunn. Sjøbunnen i mange norske havne- og fjordområder er forurenset av miljøgifter.



NØRSK  
GALLUP

Har du hørt om noen områder der sjøbunnen er spesielt forurenset av miljøgifter?

Ja

Nei

Vet ikke



NØRSK  
GALLUP

Hvor ligger områdene med forurenset sjøbunn som du kjenner til?

*Vennligst skriv navn*

Husker ingen navn



NØRSK  
GALLUP

Miljøgifter er stoffer det tar lang tid å bryte ned i naturen. De kan komme fra mange kilder, som for eksempel industri, søppelfyllinger, båter og fra husholdningene (se figuren til venstre nedenfor). Miljøgiftene kan samle seg på sjøbunnen og lekke ut i sjøen. Bildet til høyre viser en prøve av forurenset sjøbunn.



NØRSK  
GALLUP

Har du hørt om noen av disse miljøgiftene?

TBT (Tributyltinn): stoff som tidligere ble brukt i bunnstoff på skip 1/4

Ja

Nei

Vet ikke



NØRSK  
GALLUP

Har du hørt om noen av disse miljøgiftene?

PCB (Polykloreerte bifenyler): stoffer som ble brukt i elektriske artikler og i bygningsmaterialer, men som nå er forbudt 2/4

Ja

Nei

Vet ikke



NØRSK  
GALLUP

Har du hørt om noen av disse miljøgiftene?

3/4

PAH (Polysykliske aromatiske hydrokarboner): stoffer som finnes i råolje, sot og tjære.

Ja

Nei

Vet ikke

NØRSK  
GALLUP

Har du hørt om noen av disse miljøgiftene?

4/4

Tungmetaller som kvikksølv, bly og kadmium

Ja

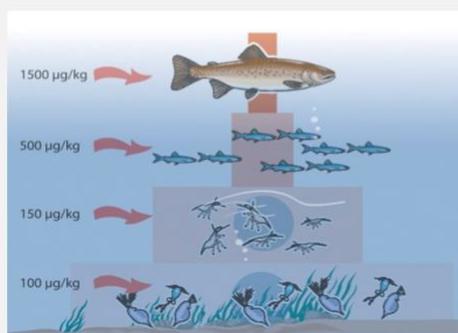
Nei

Vet ikke

NØRSK  
GALLUP

Planter, dyr og mennesker kan få i seg miljøgifter gjennom mat eller fra omgivelsene. Miljøgiftene kan gi ulike typer skader på naturmiljøet.

Mattilsynet gir råd om inntak av sjømat der det er fare for å få i seg miljøgifter. Figuren viser hvordan miljøgifter hopper seg opp i næringskjeden ( $\mu\text{g}/\text{kg}$  er et mål på antall milliontedels gram miljøgifter per kilo kjøtt).



Visste du at miljøgifter kan hope seg opp i næringskjeden?

Ja

Nei

Vet ikke

NØRSK  
GALLUP

Det vurderes nå tiltak for å rydde opp i forurenset sjøbunn i norske havner og kystområder.



Nå skal vi spesielt se på tiltak i Stavanger.



NØRSK  
GALLUP

Bildet viser havneområdet i Galeivågen og ved Jadarholm i Stavanger (merket A, B og C i kartet) der dagens situasjon for miljøgiftene er markert. Hele området er markert i rødt og viser sjøbunn som vil gi svært store miljøskader. Ved tiltak kan man oppnå miljøforbedringer, som vi forklarer etter hvert.



Visste du at det er forurenset sjøbunn i dette havneområdet i Stavanger?

Ja  
Nei  
Vet ikke



NØRSK  
GALLUP

Miljøundersøkelser av bunnsedimentene flere steder har påvist relativt høye konsentrasjoner av miljøgiftene kobber, kvikksølv, bly, polyaromatiske hydrokarboner (PAH) og tributyltinn (TBT). Forurensingen i Galeivågen og ved Jadarholm i Stavanger kan være giftig for planter og dyr som lever på sjøbunnen, og for fisk. Fugl som spiser fisk i området kan dermed også bli skadet. Det er sjøbunnen som er forurenset. Vannkvaliteten er forholdsvis bra, og det er ikke farlig å bade.

Undersøkelser viser at fiskekjøtt har relativt lave verdier av de undersøkte miljøgiftene, men Mattilsynet advarer generelt mot å spise lever av selvfanger fisk tatt i skjærgården. Mattilsynet advarer også alle mot å spise blåskjell fra området.

Hva synes du om at sjøbunnen i Stavanger er forurenset?

Svært negativt  
Ganske negativt  
Verken negativt eller positivt  
Ganske positivt  
Svært positivt  
Vet ikke



NØRSK  
GALLUP

## Miljøskader i Stavanger havn med og uten tiltak

Tabellen nedenfor viser fire nivåer for miljøskade i norske havner. Miljøskadene kan variere fra svært stor miljøskade (rød farge) til ingen miljøskade (grønn farge).

I havneområdene Galeivågen og Jadarholm i Stavanger vil man uten tiltak få svært stor miljøskade siden hele området er farget rødt (som vist i kartet i tidligere skjermbilde).

Ved mer omfattende tiltak som enten dekker til eller fjerner miljøgiftene er det på kort sikt mulig å fjerne miljøskadene (grønt nivå). Men på grunn av gradvis tilførsel av ny forurensning, som det er vanskelig å gjøre noe med i byområder, vil man på lang sikt trolig uansett få moderat miljøskade (gult nivå) i hele eller deler av tiltaksområdet. Merk at selve vannkvaliteten forblir god og uendret som følge av tiltak. Bading, friluftsliv og fritidsfiske påvirkes ikke. Gyteområder for fisk påvirkes heller ikke. Av de truede artene i området er det dem som lever i og nær sjøbunnen som påvirkes mest.

Vi skal bruke den samme skadetabellen i de neste spørsmålene. Ta deg god tid til å se på den.

Konsekvenskategori	Svært stor miljøskade	Stor miljøskade	Moderat miljøskade	Ingen miljøskade
 Liv i sjøen	Svært store negative effekter for dyr og planter som lever på bunnen og for fisk.	Store negative effekter for dyr og planter som lever på bunnen og for fisk.	Moderate negative effekter for dyr og planter som lever på bunnen og for fisk.	Ingen negative effekter for dyr og planter som lever på bunnen og for fisk.
 Truede arter	Svært store negative effekter på truede og sårbare arter, f.eks. ærfugl og makrellterne.	Store negative effekter på truede og sårbare arter, f.eks. ærfugl og makrellterne.	Moderate negative effekter på truede og sårbare arter, f.eks. ærfugl og makrellterne.	Ingen effekter på truede og sårbare arter.
 Matinntak	Skalldyr <b>skal ikke</b> spises. Lokal fisk <b>skal ikke</b> spises av gravide, ammende og små barn. (Advarsel fra Mattilsynet)	Skalldyr <b>skal ikke</b> spises. Lokal fisk <b>skal ikke</b> spises av gravide, ammende og små barn. (Advarsel fra Mattilsynet)	Skalldyr <b>bør ikke</b> spises. Lokal fisk <b>bør ikke</b> spises av gravide, ammende og små barn.	Skalldyr <b>kan</b> spises unntaksvis. Lokal fisk <b>kan unntaksvis</b> spises av gravide, ammende og små barn.



## For hvilken miljøkategori synes du det er viktigst å unngå skader?

Liv i sjøen

Truede arter

Matinntak

Synes alle er like viktige

Synes ingen er viktig

Vet ikke



Myndighetene vurderer tiltak som vil redusere miljøgiftene i Galeivågen og ved Jadarholm i Stavanger.

Miljødirektoratet vurderer tiltak som dekker til den forurensete sjøbunnen med rene masser. Det er også aktuelt å grave opp noe av de forurensete massene før man dekker til, for å bevare den samme dybden slik at skip kan seile trygt. De forurensete massene vil deponeres i et sikkert deponi som vil være helt tett og ikke lekke forurensing. Det vurderes tiltak av litt ulike størrelser. Slike tiltak vil bidra til å redusere skadene fra forurensete sedimenter, og dyr og planter vil gradvis komme tilbake til sjøbunnen.

Hvor sikkert tror du det er at rydding av forurenset sjøbunn fører til at miljøskaden reduseres?

Svært sikkert
Ganske sikkert
Verken eller
Litt usikkert
Svært usikkert
Vet ikke



Vi ønsker at du vurderer fire ulike tiltak etter tur

Du vil nå få fire tiltak å vurdere etter tur (se tabellen nedenfor). Kolonnen merket "Tiltaksområde" viser størrelsen på arealene. Vi vil starte med det minste tiltaket (areal A i tabellen), deretter vil du bli spurt om gradvis større tiltak (arealene B og C). De tre første tiltakene vil redusere miljøskaden fra svært stor (rød farge) til moderat (gul farge) innenfor de merkede arealene. Det fjerde tiltaket, nederst i tabellen, vil være det mest omfattende. Der foreslås det også tiltak for å redusere videre forurensing til havnen slik at en kan redusere miljøskaden helt (grønn farge) i hele det aktuelle havneområdet.

Tiltaksområde	Størrelse på areal (m <sup>2</sup> )	Uten tiltak	Med tiltak
A	65 000		→
A + B	140 000		→
A + B + C	180 000 (hele havneområdet)		→
A + B + C	180 000 (hele havneområdet)		→



## Hva er det verdt for deg og din husholdning å redusere miljøskadene?

Vi ber deg nå tenke gjennom hva det er verdt for deg og din husholdning å rydde opp i forurenset sjøbunn i Galeivågen og ved Jadarholm i Stavanger. Forurensingen kommer fra mange kilder lokalt, inkludert husholdningene. Det er derfor naturlig at alle husholdningene i Stavanger er med å betale for tiltak gjennom en øremerket kommunal engangsvgift som vil gå uavkortet til tiltak.

Hvis du har næringsvirksomhet eller jobb som kan påvirkes av tiltak, ber vi deg om å holde dette utenfor vurderingen. Det er hva det er verdt for deg og din husholdning vi gjerne vil vite.



## Tiltak som gir en forbedring fra svært stor til moderat miljøskade i del A av havnen

Vi spør deg først om tiltak i Indre Galeivågen, merket A i kartet. Dette området er ca. 65 000 kvadratmeter stort. Det vil si rundt 8 fotballbaner. Uten tiltak, vil miljøskaden da forbli svært stor i dette området og i resten av havnen (rødt i tabellen). Hele området (A+B+C) er omtrent 180 000 kvadratmeter stort. Det vil si rundt 22 fotballbaner. Dersom et mindre tiltak gjennomføres, vil man kunne redusere miljøskaden fra svært stor til moderat i del A av havnen. Vi går da fra rødt til gult i tabellen og kartet nedenfor.

Konsekvenskategori	Svært stor miljøskade	Stor miljøskade	Moderat miljøskade	Ingen miljøskade
 Liv i sjøen	Svært store negative effekter for dyr og planter som lever på bunnen og for fisk.	Store negative effekter for dyr og planter som lever på bunnen og for fisk.	Moderate negative effekter for dyr og planter som lever på bunnen og for fisk.	Ingen negative effekter for dyr og planter som lever på bunnen og for fisk.
 Truede arter	Svært store negative effekter på truede og sårbare arter, f.eks. ærfugl og makrellterne.	Store negative effekter på truede og sårbare arter, f.eks. ærfugl og makrellterne.	Moderate negative effekter på truede og sårbare arter, f.eks. ærfugl og makrellterne.	Ingen effekter på truede og sårbare arter.
 Matinntak	Skalldyr skal ikke spises. Lokal fisk skal ikke spises av gravide, ammende og små barn. (Advarsel fra Mattilsynet)	Skalldyr skal ikke spises. Lokal fisk skal ikke spises av gravide, ammende og små barn. (Advarsel fra Mattilsynet)	Skalldyr bør ikke spises. Lokal fisk bør ikke spises av gravide, ammende og små barn.	Skalldyr kan spises unntaksvis. Lokal fisk kan unntaksvis spises av gravide, ammende og små barn.



Hva er det verdt for deg og din husholdning å få en forbedring i del A av havnen, fra svært stor til moderat miljøskade (fra rødt til gult), som vist på kartene?

Marker på skalaen nedenfor det meste, om noe, husholdningen din helt sikkert er villig til å betale i en øremerket kommunal engangsvgift for tiltak som vil gi en slik miljøforbedring fra rødt til gult i del A av havnen. Husk at resten av havnen forblir som i dag med svært stor miljøskade (rødt). Husk også på at dersom husholdningen din betaler for dette har dere mindre penger å bruke på andre ting.

Du vil i de neste skjermbildene etter tur bli spurt om de større tiltakene i arealene B og C. Beløpet du eventuelt oppgir for hvert nytt tiltak vil komme istedenfor det du oppga for tidligere tiltak.

Klikk på markøren og trekk den til det høyeste beløpet du er villig til å betale.

Engangsbetaling i kroner:



NORSK  
GALLUP

Du har ovenfor sagt at du, eller husholdningen din, ikke er villig til å betale noe for opprydding av forurenset sjøbunn.

Hva er den viktigste grunnen til at du og husholdningen din ikke vil betale? Merk den ene grunnen som var aller viktigst for deg/dere

Jeg ville betalt for tiltak i andre kyst- eller havneområder

Dagens innsats mot forurensning og rene havneområder er bra nok

Miljøforbedringen er liten

Området som ryddes opp er en liten del av havnen

Jeg føler det ikke er riktig å veie miljøet i penger

Jeg vil ikke betale før jeg vet hva det koster

Skatter og avgifter er allerede høye nok

Husholdningen min har ikke råd til å betale for dette

Hva jeg sier vil ikke påvirke om tiltak blir gjennomført eller ikke

Jeg mener andre samfunnsoppgaver bør prioriteres først

Det er rent nok som det er i havna

Må ryddes helt opp slik at det ikke blir noen miljøskade, ikke bare mindre tiltak

Jeg tror ikke miljøskadene er så store

En engangsvgift er urealistisk og/eller utilstrekkelig

Det er de som har sluppet ut miljøgiftene som må betale

Jeg stoler ikke på at pengene vil gå til dette formålet

Jeg blir ikke påvirket av at det er forurenset sjøbunn i havneområdene i Stavanger

Annen årsak, vennligst spesifiser:

Usikker /Vet ikke



NORSK  
GALLUP

Test - v2

Du svarte mer enn 12 000 kr på forrige spørsmål.

Vennligst spesifiser nøyaktig beløp her



Du har ovenfor sagt at du, eller husholdningen din, ikke vet hva du vil betale.

Hva er den viktigste grunnen til at du svarte 'Vet ikke'?

Merk den ene grunnen som var aller viktigst for deg/dere:

Jeg synes det var for vanskelig å oppgi et beløp

Jeg kan ikke svare på vegne av husholdningen min

Jeg er usikker på om jeg har råd til å betale noe

Jeg synes ikke det er riktig å veie miljøet i penger

Jeg tror ikke tiltaket vil ha noen effekt

Jeg er usikker, men vil trolig ikke betale noe for dette

Annen årsak, vennligst spesifiser:

\_\_\_\_\_

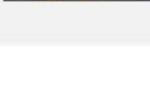
Usikker /Vet ikke



NØRSK  
GALLUP

Tiltak som gir en forbedring fra svært stor til moderat miljøskade i en større del av havnen.

Istedenfor, kan det gjennomføres et større tiltak som reduserer miljøskaden fra svært stor (rødt) til moderat (gult) i en større del av havnen, som vist i figuren og på kartet (merket A og B). Dette området er til sammen ca. 140.000 kvadratmeter stort. Det vil si rundt 17 fotballbaner, omtrent dobbelt så stort som bare areal A.

Konsekvenskategori	Svært stor miljøskade	Stor miljøskade	Moderat miljøskade	Ingen miljøskade
 	 <b>Svært store negative effekter</b> for dyr og planter som lever på bunnen og for fisk.	 Store negative effekter for dyr og planter som lever på bunnen og for fisk.	 <b>Moderate negative effekter</b> for dyr og planter som lever på bunnen og for fisk.	 Ingen negative effekter for dyr og planter som lever på bunnen og for fisk.
	<b>Svært store negative effekter</b> på truede og sårbare arter, f.eks. ærfugl og makrellterne.	Store negative effekter på truede og sårbare arter, f.eks. ærfugl og makrellterne.	<b>Moderate negative effekter</b> på truede og sårbare arter, f.eks. ærfugl og makrellterne.	Ingen effekter på truede og sårbare arter.
	<b>Skalldyr skal ikke spises.</b> Lokal fisk <b>skal ikke</b> spises av gravide, ammende og små barn. (Advarsel fra Mattilsynet)	Skalldyr skal ikke spises. Lokal fisk skal ikke spises av gravide, ammende og små barn. (Advarsel fra Mattilsynet)	<b>Skalldyr bør ikke spises.</b> Lokal fisk <b>bør ikke</b> spises av gravide, ammende og små barn.	Skalldyr kan spises unntaksvis. Lokal fisk kan unntaksvis spises av gravide, ammende og små barn.



NØRSK  
GALLUP

Hva er det verdt for deg og din husholdning å få en forbedring i del A og B av havnen, fra svært stor til moderat miljøskade (fra rødt til gult), som vist på kartene?

Marker på skalaen nedenfor det meste, om noe, husholdningen din helt sikkert er villig til å betale i en øremerket kommunal engangsvgift for tiltak som vil gi en slik miljøforbedring. Dette beløpet vil komme istedenfor beløpet du oppga ovenfor.

Husk at del C av havnen forblir som i dag med svært stor miljøskade (rødt).

Husk også på at dersom husholdningen din betaler for dette har dere mindre penger å bruke på andre ting.

*Klikk på markøren og trekk den til det høyeste beløpet du er villig til å betale.*

Engangsbetaling i kroner:



NØRSK  
GALLUP

Du har ovenfor sagt at du, eller husholdningen din, ikke er villig til å betale noe for opprydding av forurenset sjøbunn. Hva er den viktigste grunnen til at du og husholdningen din ikke vil betale? Merk den ene grunnen som var aller viktigst for deg/dere

- Jeg ville betalt for tiltak i andre kyst- eller havneområder
  - Dagens innsats mot forurensning og rene havneområder er bra nok
  - Miljøforbedringen er liten
  - Området som ryddes opp er en liten del av havnen
  - Jeg føler det ikke er riktig å veie miljøet i penger
  - Jeg vil ikke betale før jeg vet hva det koster
  - Skatter og avgifter er allerede høye nok
  - Husholdningen min har ikke råd til å betale for dette
  - Hva jeg sier vil ikke påvirke om tiltak blir gjennomført eller ikke
  - Jeg mener andre samfunnsoppgaver bør prioriteres først
  - Det er rent nok som det er i havna
  - Må ryddes helt opp slik at det ikke blir noen miljøskade, ikke bare mindre tiltak
  - Jeg tror ikke miljøskadene er så store
  - En engangsvgift er urealistisk og/eller utilstrekkelig
  - Det er de som har sluppet ut miljøgiftene som må betale
  - Jeg stoler ikke på at pengene vil gå til dette formålet
  - Jeg blir ikke påvirket av at det er forurenset sjøbunn i havneområdene i Stavanger
  - Annen årsak, vennligst spesifiser:
- Usikker /Vet ikke



NØRSK  
GALLUP

Du svarte mer enn 12 000 kr på forrige spørsmål.

Vennligst spesifiser nøyaktig beløp her



NØRSK  
GALLUP

Du har ovenfor sagt at du, eller husholdningen din, ikke vet hva du vil betale.

Hva er den viktigste grunnen til at du svarte 'Vet ikke'?

Merk den ene grunnen som var aller viktigst for deg/dere:

Jeg synes det var for vanskelig å oppgi et beløp

Jeg kan ikke svare på vegne av husholdningen min

Jeg er usikker på om jeg har råd til å betale noe

Jeg synes ikke det er riktig å veie miljøet i penger

Jeg tror ikke tiltaket vil ha noen effekt

Jeg er usikker, men vil trolig ikke betale noe for dette

Annen årsak, vennligst spesifiser:

Usikker /Vet ikke



NØRSK  
GALLUP

## Tiltak som gir en forbedring til moderat miljøskade i hele det aktuelle havneområdet

Det kan istedenfor gjennomføres et enda større tiltak som reduserer miljøskaden fra svært stor (rødt) til moderat (gult) i en enda større del av havnen, som også inkluderer områdene rundt Jadarholm (merket C i kartet). Områdene A, B og C er til sammen ca. 180.000 kvadratmeter stort. Det vil si rundt 22 fotballbaner, omtrent 40 000 kvadratmeter større enn bare arealene A+B.

Konsekvenskategori	Svært stor miljøskade	Stor miljøskade	Moderat miljøskade	Ingen miljøskade
 Liv i sjøen	Svært store negative effekter for dyr og planter som lever på bunnen og for fisk.	Store negative effekter for dyr og planter som lever på bunnen og for fisk.	Moderate negative effekter for dyr og planter som lever på bunnen og for fisk.	Ingen negative effekter for dyr og planter som lever på bunnen og for fisk.
 Truede arter	Svært store negative effekter på truede og sårbare arter, f.eks. ærfugl og makrellterne.	Store negative effekter på truede og sårbare arter, f.eks. ærfugl og makrellterne.	Moderate negative effekter på truede og sårbare arter, f.eks. ærfugl og makrellterne.	Ingen effekter på truede og sårbare arter.
 Matinntak	Skalldyr skal ikke spises. Lokal fisk skal ikke spises av gravide, ammende og små barn. (Advarsel fra Mattilsynet)	Skalldyr skal ikke spises. Lokal fisk skal ikke spises av gravide, ammende og små barn. (Advarsel fra Mattilsynet)	Skalldyr bør ikke spises. Lokal fisk bør ikke spises av gravide, ammende og små barn.	Skalldyr kan spises unntaksvis. Lokal fisk kan unntaksvis spises av gravide, ammende og små barn.



NØRSK  
GALLUP



Du har ovenfor sagt at du, eller husholdningen din, ikke vet hva du vil betale.

Hva er den viktigste grunnen til at du svarte 'Vet ikke'?

Merk den ene grunnen som var aller viktigst for deg/dere:

Jeg synes det var for vanskelig å oppgi et beløp

Jeg kan ikke svare på vegne av husholdningen min

Jeg er usikker på om jeg har råd til å betale noe

Jeg synes ikke det er riktig å veie miljøet i penger

Jeg tror ikke tiltaket vil ha noen effekt

Jeg er usikker, men vil trolig ikke betale noe for dette

Annen årsak, vennligst spesifiser:

\_\_\_\_\_

Usikker /Vet ikke



## Tiltak som gir en forbedring til ingen miljøskade i hele det aktuelle havneområdet

Ved enda mer omfattende tiltak er det mulig å få kontroll på alle kilder til forurensingen slik at en kan redusere miljøskaden fra svært stor (rødt) til ingen (grønt) i hele det aktuelle havneområdet (merket A+B+C).

Konsekvenskategori	Svært stor miljøskade	Stor miljøskade	Moderat miljøskade	Ingen miljøskade
 Liv i sjøen	Svært store negative effekter for dyr og planter som lever på bunnen og for fisk.	Store negative effekter for dyr og planter som lever på bunnen og for fisk.	Moderate negative effekter for dyr og planter som lever på bunnen og for fisk.	Ingen negative effekter for dyr og planter som lever på bunnen og for fisk.
 Truede arter	Svært store negative effekter på truede og sårbare arter, f.eks. ærfugl og makrellterne.	Store negative effekter på truede og sårbare arter, f.eks. ærfugl og makrellterne.	Moderate negative effekter på truede og sårbare arter, f.eks. ærfugl og makrellterne.	Ingen effekter på truede og sårbare arter.
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## Hva er det verdt for deg og din husholdning å få en forbedring i hele det aktuelle havneområdet (arealene A+B+C), til ingen miljøskade (fra rødt til grønt)?

Marker på skalaen nedenfor det meste, om noe, husholdningen din helt sikkert er villig til å betale i en øremerket kommunal engangsavgift for tiltak som vil gi en slik miljøforbedring. Dette beløpet vil komme istedenfor beløpene du oppga ovenfor. Hele det aktuelle havneområdet vil dermed ha grønn farge (ingen miljøskade). Husk også på at dersom husholdningen din betaler for dette har dere mindre penger å bruke på andre ting.

Tenk på hvor mye mer det ville bety for deg og din husholdning at det kan bli helt rent i havneområdet. Beløpet vil komme istedenfor beløpene du har oppgitt ovenfor.

*Klikk på markøren og trekk den til det høyeste beløpet du er villig til å betale.*

Engangsbeløp i kroner:



NØRSK  
GALLUP

Du har ovenfor sagt at du, eller husholdningen din, ikke er villig til å betale noe for opprydding av forurenset sjøbunn. Hva er den viktigste grunnen til at du og husholdningen din ikke vil betale? Merk den ene grunnen som var aller viktigst for deg/dere

Jeg ville betalt for tiltak i andre kyst- eller havneområder

Dagens innsats mot forurensning og rene havneområder er bra nok

Miljøforbedringen er liten

Området som ryddes opp er en liten del av havnen

Jeg føler det ikke er riktig å veie miljøet i penger

Jeg vil ikke betale før jeg vet hva det koster

Skatter og avgifter er allerede høye nok

Husholdningen min har ikke råd til å betale for dette

Hva jeg sier vil ikke påvirke om tiltak blir gjennomført eller ikke

Jeg mener andre samfunnsoppgaver bør prioriteres først

Det er rent nok som det er i havna

Må ryddes helt opp slik at det ikke blir noen miljøskade, ikke bare mindre tiltak

Jeg tror ikke miljøskadene er så store

En engangsavgift er urealistisk og/eller utilstrekkelig

Det er de som har sluppet ut miljøgiftene som må betale

Jeg stoler ikke på at pengene vil gå til dette formålet

Jeg blir ikke påvirket av at det er forurenset sjøbunn i havneområdene i Stavanger

Annen årsak, vennligst spesifiser:

\_\_\_\_\_

Usikker /Vet ikke



NØRSK  
GALLUP

Du har ovenfor sagt at du, eller husholdningen din, ikke vet hva du vil betale.

Hva er den viktigste grunnen til at du svarte "Vet ikke"?

Merk den ene grunnen som var aller viktigst for deg/dere:

Jeg synes det var for vanskelig å oppgi et beløp

Jeg kan ikke svare på vegne av husholdningen min

Jeg er usikker på om jeg har råd til å betale noe

Jeg synes ikke det er riktig å veie miljøet i penger

Jeg tror ikke tiltaket vil ha noen effekt

Jeg er usikker, men vil trolig ikke betale noe for dette

Annen årsak, vennligst spesifiser:

Usikker /Vet ikke



NØRSK  
GALLUP

Hvordan vurderer du beløpene du har oppgitt i forhold til tiltakenes størrelse?

På neste side ser du engangsbeløpene du oppga for å redusere miljøskaden i de ulike delene av havnen.

Noen oppgir høyere beløp enn de faktisk vil betale. Det kan også være vanskelig å vurdere de ulike miljøforbedringene opp mot hverandre.

Vi ber deg derfor vurdere beløpene du oppga en gang til, slik at du er helt sikker på dem.

Se spesielt på om beløpet du har oppgitt for det minste tiltaket står i rimelig forhold til det du oppga for det største tiltaket. Husk at det bare er ett av tiltakene som vil gjennomføres og som du må betale for.

Om du vil endre, gjør du det ved å trykke på pilene til høyre for tabellen. Om du ikke vil endre kan du bare gå videre. Det er ikke noe riktig eller galt svar her.



NØRSK  
GALLUP

Du svarte mer enn 12 000 kr på forrige spørsmål.

Vennligst spesifiser nøyaktig beløp her



NØRSK  
GALLUP

Havneområde	Test - v2		Endre til nytt beløp?
	Uten tiltak	Med tiltak	
A (65 000 kvadratmeter)	Svært stor miljøskade	Moderat miljøskade	Valgt verdi: Vet ikke <input type="text"/>
A + B (140 000 kvadratmeter)	Svært stor miljøskade	Moderat miljøskade	Valgt verdi: 500 <input type="text"/>
A + B + C (180 000 kvadratmeter, hele havnen)	Svært stor miljøskade	Moderat miljøskade	Valgt verdi: 900 <input type="text"/>
A + B + C (180 000 kvadratmeter, hele havnen)	Svært stor miljøskade	Ingen miljøskade	Valgt verdi: 1500 <input type="text"/>



NØRSK  
GALLUP

Test - v2  
Du har sagt at du og husholdningen din er villig til å betale for å gjennomføre ett eller flere tiltak for å redusere miljøskaden fra forurenset sjøbunn i Stavanger. Hvilket av disse utsagnene synes du best beskriver hvorfor du er villig til å betale for dette?

Jeg er opptatt av å bevare mangfoldet i havet

Jeg er opptatt av en ren havn, som jeg selv bruker

Jeg er opptatt av en ren havn, selv om jeg ikke bruker den selv

Jeg pleier å gi til slike formål

Jeg er redd for mulige helseeffekter for meg og familien min

Jeg er opptatt av å bevare en ren kyst og et rent hav

Ingen av utsagnene ovenfor passer helt eller delvis. Skriv den viktigste grunnen til at du vil betale:

Vet ikke



NØRSK  
GALLUP

Test - v2  
Tenk deg at det i tillegg til ett tiltak i Stavanger også ble vurdert lignende tiltak i en annen havn i en nabokommune. Hvis du i tillegg til å betale avgift for ett tiltak i Stavanger hadde blitt bedt om å betale for å rydde opp i havnen i nabokommunen, ville du vært villig til å betale noe i tillegg til det du oppga for tiltak i Stavanger?  
*Kryss av for det alternativet du mener passer best med din mening*

Nei

Ja

Usikker, det vil avhenge av hvilken kommune det er

Usikker, det vil avhenge av hvor stor miljøforbedringen er

Annet, vennligst spesifiser:

Vet ikke



NØRSK  
GALLUP

Test - v2

Tenk deg at det i tillegg til ett tiltak i Stavanger ble vurdert lignende tiltak i en annen havn i et fylke i en annen del av landet. Hvis du i tillegg til å betale avgift for ett tiltak i Stavanger hadde blitt bedt om å betale for å rydde opp i havnen i dette fylket, ville du vært villig til å betale noe i tillegg til det du oppga for tiltak i Stavanger?

Kryss av for det alternativet du mener passer best med din mening

<input type="checkbox"/>	Nei
<input type="checkbox"/>	Ja
<input type="checkbox"/>	Usikker, det vil avhenge av hvilket fylke det er
<input type="checkbox"/>	Usikker, det vil avhenge av hvor stor miljøforbedringen er
<input type="checkbox"/>	Annet, vennligst spesifiser: <hr/>
<input type="checkbox"/>	Vet ikke



NØRSK  
GALLUP

Test - v2

Hvor sikkert eller usikkert tror du det er at myndighetene vil bruke resultatene fra denne undersøkelsen når de bestemmer hvor omfattende nye tiltak de skal sette i verk for å unngå miljøskader av forurenset sjøbunn i havneområdene i Stavanger?

<input type="checkbox"/>	Helt sikkert
<input type="checkbox"/>	Ganske sikkert
<input type="checkbox"/>	Ganske sikkert ikke
<input type="checkbox"/>	Helt sikkert ikke
<input type="checkbox"/>	Vet ikke



NØRSK  
GALLUP

Test - v2

Hvor sikkert eller usikkert tror du det er at husholdningen din må betale en øremerket kommunal engangsavgift, dersom det blir gjennomført nye tiltak for forurenset sjøbunn i havneområdene i Stavanger?

<input type="checkbox"/>	Helt sikkert
<input type="checkbox"/>	Ganske sikkert
<input type="checkbox"/>	Ganske sikkert ikke
<input type="checkbox"/>	Helt sikkert ikke
<input type="checkbox"/>	Vet ikke



NØRSK  
GALLUP

Hvor ofte har du foretatt fritidsaktiviteter ved Galeivågen og Jadarholm de siste 12 månedene? Det kan for eksempel være båtturer, fisking, bading, spasing langs havnen eller andre aktiviteter i havneområdet. Tell alle aktiviteter som varte mer enn 1 time per dag som 1 dag.

 Ikke i det hele tatt

 Én gang (1 dag)

 2-12 dager

 13-24 dager

 25 dager eller mer

 Vet ikke


NØRSK  
GALLUP

Om det ble ryddet opp i forurenset sjøbunn til moderat eller ingen miljøskade i de nevnte havneområdene i Stavanger, ville du da brukt områdene mer, mindre eller like mye til fritidsaktiviteter de neste årene?

 Mer

 Mindre

 Like mye

 Har ikke brukt havnen de siste 12 månedene

 Vet ikke


NØRSK  
GALLUP

Til slutt ønsker vi å stille noen spørsmål om deg som deltager i internettpanel for spørreundersøkelser.

Hvilke(t) panel(er) for internett-baserte spørreundersøkelser er du medlem av?

 Bare GallupPanelet (TNS Kantar)

 Bare Norstatpanelet

 Både GallupPanelet og Norstatpanelet

 Flere/andre panel i tillegg til minst ett av panelene ovenfor

 Vet ikke


NØRSK  
GALLUP

Test - v2

Omtrent hvor lenge har du vært medlem av internettpanel for spørreundersøkelser?

Hvis du har vært litt av og på, regn fra det året du først ble medlem

Kortere enn 1 år

1-2 år

2-3 år

3-4 år

4-5 år

5-6 år

6-7 år

8-9 år

Flere enn 9 år, vennligst anslå ca. antall:

Vet ikke



NØRSK  
GALLUP

Test - v2

Hva er din hovedmotivasjon for å være medlem i paneler for spørreundersøkelser?

Velg ett av alternativene

Jeg synes det er morsomt å svare på spørreundersøkelser

Jeg mener det er viktig å svare på spørreundersøkelser som kan gi bedre produkter for oss forbrukere

Jeg mener det er viktig å svare på spørreundersøkelser som et bidrag til samfunnet

Tjene poeng som jeg kan donere til ulike formål

Tjene poeng som jeg kan kjøpe varer for

Annet, vennligst spesifiser:

\_\_\_\_\_

Vet ikke / vil ikke oppgi



NØRSK  
GALLUP

Test - v2

Før denne spørreundersøkelsen, omtrent hvor mange spørreundersøkelser gjennom internettpanel har du totalt svart på den siste måneden?

Ingen

1-3

4-6

7-9

10-12

13-15

16-18

19-20

Flere enn 20, vennligst anslå ca. antall:

\_\_\_\_\_

Vet ikke



NØRSK  
GALLUP

Omtrent hvor mange spørreundersøkelser gjennom internettpanel vil du anslå at du totalt har svart på siden du først ble medlem?

1-20
21-40
41-60
61-80
81-100
Flere enn 100, vennligst anslå ca. antall:
<input type="text"/>
Vet ikke



NØRSK  
GALLUP

Hvor stor andel av panelundersøkelsene du er blitt invitert til vil du anslå at du har svart på?

0-9%
10-19%
20-29%
30-39%
40-49%
50-59%
60-69%
70-79%
80-89%
90-100%
Vet ikke



NØRSK  
GALLUP

Helt til slutt ber vi deg om å oppgi noe bakgrunnsinformasjon om deg selv og husholdningen din.

Alt i alt, hvor fornøyd er du med livet ditt for tiden?

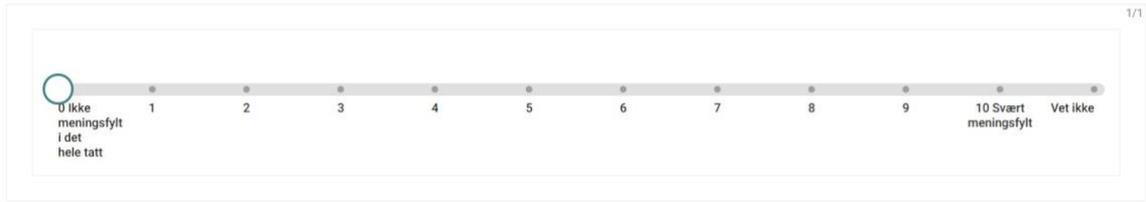
1/1

0 Ikke fornøyd i det hele tatt    1    2    3    4    5    6    7    8    9    10 Svært fornøyd Vet ikke



NØRSK  
GALLUP

Alt i alt, i hvilken grad opplever du at det du gjør i livet er meningsfylt?



NØRSK  
GALLUP

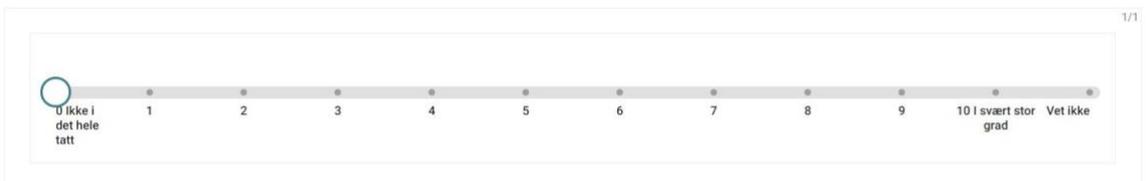
Føler du deg ofte ensom?

Ofte
Av og til
Sjelden
Aldri
Vet ikke



NØRSK  
GALLUP

Tenk på hvordan du har følt deg så langt i dag. I hvilken grad er du lykkelig?



NØRSK  
GALLUP

Tenk deg at en tenniser racket og en ball totalt koster 110 kroner. Racketen koster 100 kroner mer enn ballen. Hvor mye koster ballen?  
*Skriv svar (tall i kroner)*

Vet ikke



NØRSK  
GALLUP

Er du medlem i en friluftslivs- og/eller miljøorganisasjon?

Test - v2

Ja

Nei

Vet ikke



NØRSK  
GALLUP

Hva er din høyeste fullførte utdanning?

Test - v2

Grunnskole (7-10 år)

Videregående skole/gymnas

Fagbrev

3-4-årig universitetsutdanning (bachelor/cand.mag.)

5-årig universitetsutdanning (mastergrad/profesjonsutdanning)

PhD/doktorgrad

Annet, vennligst spesifiser:

\_\_\_\_\_

Usikker/vet ikke



NØRSK  
GALLUP

Jobber du, eller andre i husholdningen din, i noen av disse næringene?

Test - v2

*Merk alle som passer*

Skjell- og fiskeoppdrett

Næringsfiske

Petroleumssektoren

Turistnæringen

Skipsfart

Landbasert industri

Forskning eller utdanning innen områdene ovenfor

Nei, verken jeg eller andre i husholdningen min jobber i noen av næringene ovenfor

Vet ikke



NØRSK  
GALLUP

Hva vil du anslå at din personlige samlede brutto inntekt var i 2018? Det vil si din samlede inntekt før skatten er trukket fra.

- Inntil 199.999 kr
  - 200.000 - 399.999 kr
  - 400.000 - 599.999 kr
  - 600.000 - 799.999 kr
  - 800.000 - 999.999 kr
  - 1.000.000 - 1.199.999 kr
  - 1.200.000 - 1.399.999 kr
  - 1.400.000 - 1.599.999 kr
  - 1.600.000 - 1.799.999 kr
  - 1.800.000 - 1.999.999 kr
  - 2.000.000 - 2.199.999 kr
  - 2.200.000 - 2.599.999 kr
  - 2.600.000 - 2.799.999 kr
  - 2.800.000 - 2.999.999 kr
  - 3.000.000 kr. eller mer - vennligst spesifiser:
- 
- Ønsker ikke å oppgi
- Vet ikke



NØRSK  
GALLUP

Hva vil du anslå at din husholdnings samlede brutto inntekt var i 2018? Det vil si all samlet inntekt i husholdningen før skatten er trukket fra.

- Inntil 199.999 kr
  - 200.000 - 399.999 kr
  - 400.000 - 599.999 kr
  - 600.000 - 799.999 kr
  - 800.000 - 999.999 kr
  - 1.000.000 - 1.199.999 kr
  - 1.200.000 - 1.399.999 kr
  - 1.400.000 - 1.599.999 kr
  - 1.600.000 - 1.799.999 kr
  - 1.800.000 - 1.999.999 kr
  - 2.000.000 - 2.199.999 kr
  - 2.200.000 - 2.599.999 kr
  - 2.600.000 - 2.799.999 kr
  - 2.800.000 - 2.999.999 kr
  - 3.000.000 eller mer - vennligst spesifiser:
- 
- Ønsker ikke å oppgi
- Vet ikke



NØRSK  
GALLUP

Da er vi ferdige - er det noe annet du ønsker å si om undersøkelsen eller temaet vi har vært gjennom?

Registrer svaret her



NØRSK  
GALLUP



**Norges miljø- og biovitenskapelige universitet**  
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