Implementation of Artificial Intelligence in Healthcare

Norwegian residents' self-assessed understanding of AI in health and their attitudes towards ethical governance.

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1. Abstract

BACKGROUND: Artificial intelligence's (AI) influence in the domain of health is expected to increase. In order to enter the public debate, the citizens, as stakeholders, need to be knowledgeable about AI and health and aware of the ethical issues that it involves. OBJECTIVES: We want to explore people's self-reported level of knowledge and their attitudes towards use of AI in health. METHOD: We have therefore asked a sample of 1015 respondents residing in Norway about their knowledge of, and attitudes towards, AI in health. More concretely, this study explores the self-assessed general knowledge of how AI technology works, attitudes towards implementation of AI in healthcare, decision-making based on AI, use of robots in elderly care and the need for legal regulation of the use of AI in health. RESULTS: This exploratory study reveals that Norwegian residents have a rather high self-assessed understanding of AI and its implementation in healthcare. They are aware of the ethical issues brought by implementing robots in elder care. They would generally trust a healthcare decision based on AI results if it's reviewed by a medical doctor but they would generally not trust it if it's not reviewed by a medical doctor. They also largely agreed on the need for legal regulation of AI in health. The analysis showed that the knowledge about AI is significantly lower among women, elders, respondents with secondary education and low household incomes. The opposite is true for men, under 40 years old, other education levels and high household incomes. The respondents assessing a lower understanding of AI have the tendency to be more sceptical towards the use of robots for elder care and the decision making based on AI with and without the approval of a medical doctor as opposed to those with higher self-assessed understanding. When it comes to decisions directly based on AI without the approval of a Medical doctor and the need of a legal regulation to control AI in health, there were no significant differences between the educational groups. More research is necessary to explains those tendencies.

2. Table of contents

3. Key words

Artificial intelligence, Health, Trust, Knowledge, Survey, Understanding, Education

4. List of abbreviations

AI: Artificial intelligence
IT: Information technology
K-W: Kruskal-Wallis test
HSD: Honest significative difference

5. Acknowledgements

I am deeply grateful to Kristine Bærøe[1], my supervisor for her active help throughout the whole process in this thesis and further after.
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[2] **Cornelius Cappelen**, Associate Professor, Department of Comparative Politics, University of Bergen

6. Introduction

The enormous growth potential of AI is seen as an opportunity to improve the healthcare system. The citizens of Norway are the beneficiaries of the healthcare system and also stakeholders in the decision making of their country. This technology being very new, it is expected that at least a part of the population doesn't understand it or isn't aware of the ethical issues it is raising. This explorative study aims at understanding the attitudes of the Norwegian residents towards the implementation of AI in health and highlight a possible need for education in this field.

Background

According to the "Ethics Guidelines for trustworthy AI" written by a high-level group of experts for the European commission, the definition of AI is: "AI systems act in the physical or digital dimension by perceiving their environment, processing and interpreting information and deciding the best action(s) to take to achieve the given goal. Some AI systems can adapt their behaviour by analysing how the environment is affected by their previous actions" [1].

AI covers different types of technologies. The main type of AI that literature refers usually to is "Machine learning". "Machine learning is the study of computer algorithms that allows computer programs to automatically improve through experience" [2]. It's based on a flexible algorithm that adapts over time to the feedbacks coming from past exercises.

The first traces of AI are found in the years 1949 when Warren Weaver was already writing about machines that could translate languages, a task that was reserved to humans due to a need for advanced cognitive capacities. In 1950, Alan Turing wrote "Computing machinery and intelligence" from which the first theories on the Turing's test stem [3]. This test was aiming at determining if the machinery is able to simulate a human conversation. From this period to the 80s, AI did not develop much. But in the 80s, the "expert systems" business exploded. An expert system is a system that is able to behave as a human expert in certain domains such as MYCIN for bacterial detection and treatment or PXDES, a program used for diagnosing lung cancers.

One of the most famous expert system that was then created by IBM was the so called 'Deep Blue'. The Deep blue was able to defeat the chess world champion Garry Kasparov in a chess competition. The system was based on millions of games played before [4]. This shows the capacity of this system to adapt in real time. From this period of time, many experts anticipated the potential of AI in many different fields, but it took some years before it found relevant applications in different parts of the society such as business or medicine. Nowadays, many niches are occupied by AI, Tesla is improving its auto piloted cars and Google, Apple, Facebook, Amazon (GAFAs) are able to anticipate one's preferences by reading our searches on the internet for example. The machines are designed to learn from a huge pool of previous situations to address future challenges, not just to follow simple algorithms.

AI takes place in a society whose growth is constrained by the technological means already implemented. However, employment of AI technologies may clash with societal values and create ethical challenges. For example, AI is exploding in the health sector with many applications such as virtual doctors for remote areas or decision making based on AI's input[5]. This raises legal and ethical considerations. Authorities must supervise development and employment of AI so that it is not a threat but a support for development.

The European Union and AI

The European union has gathered a group of high-level experts in order to develop guidelines for a trustworthy AI [1]. According to these experts who launched their report in 2019, three necessary components are mentioned to build a trustworthy AI. A trustworthy AI must comply with all the applicable laws and regulations. It must be ethical, ensuring adherence to ethical principles and values. It must also be technically and socially robust because unintentional harm can be caused even with good intentions.

The report is based on a human right approach and identifies seven key requirements that should be implemented with constant feedback control, clear communication, involving the different stakeholders by systematic training of new experts, facilitated traceability. The seven requirements are:

- Accountability
- Human agency and oversight
- Technical robustness and safety

- Privacy and data governance
- Transparency
- Diversity, non-discrimination and fairness
- Environmental and societal well-being

In April 2021, the European Union has also launched a proposal for legal regulation of AI technologies across member states to bolster against unacceptable employment [6].

AI in Norway

Norway's Ministry of Local Government and Modernisation has adopted the European framework of trustworthy AI to write its "National Strategy for Artificial intelligence" that was released in January 2020 [7]. The Norwegian strategy involves sharing the data, regulating without limiting, investments and partnerships, ethics and security.

As a part of this strategy, a "Health analysis platform" will be created in order to make data accessible to research groups and other purposes. All this data needs a humongous capacity of computing and calculation. This will be ensured by the UNINETTSigma2[3] in Oslo, in collaboration with the European EuroPHC[4], an initiative in which Norway participates and that was established by the European commission in 2017. Furthermore, Norway participates in the Digital Europe programme (DEP) enhancing a comprehensive digitalisation and interoperability of the data.

Some of the health data in Norway falls under the health registries act. It's the national data based on public interest in monitoring statistical tendencies. It includes many registries such as birth, causes of death, immunisations, prescriptions, pregnancies and many other health information. These data repositories are established by the government without patients' consent and they are considered as necessary to maintain national functions (like for example

[3] Sigma2 coordinates Norway's participation in international collaborations on e-infrastructure. It is mandated to provide services for high-performance computing and data storage to individuals and groups involved in research and education at all Norwegian universities and colleges, and other publicly funded organizations and projects. https://www.sigma2.no/

[4] European High-Performance Computing complex. It aims at coordinating the supercomputing strategies and investments of the European countries. http://eurohpc.eu/

"cause of deaths registry"). It contains sensible information and is therefore protected from leakages (7, p21).

The public sector in Norway is often processing personal data without the explicit consent of the owner because the consent is given when the owner wants to use a service. It's possible to withdraw consent in certain health registries and grant access to persons of trust as lawyers of family members (7, p59). Exemption from the duty of confidentiality was previously sometimes granted for research purposes. This will no longer be allowed. The goal is still to connect health data, research and AI to support decision making. But these links must respect consent, confidentiality and accessibility to the different sectors (including the private sector). A "health analysis platform" will be created by the government to make health data accessible, to develop research, and to develop new medical technologies such as AI (7, p22).

Regulating a technology at an early stage without knowing what it will become is a difficult exercise. Norway's strategy is to underline the importance to not reduce the potential of AI with these regulations.

The authorities in Norway is also focusing on the trustworthy issues of AI. The government claims that Ai in Norway must (7, p59-60):

- Respect human autonomy and control
- Be safe and technically robust
- Take privacy and data protection into account
- Be transparent
- Facilitate inclusion, diversity and treatment
- Benefit society and the environment
- Be accountable

This makes the ethical guidelines in Norway very close to the ethical guidelines of the European Union described above. Only the phrasing is different but covering the same key points.

In order to educate the people on AI, Norway has launched a 6 weeks free online course that aims at educating people about artificial intelligence ([8];7, p44). The initiative to develop such a course comes from the University of Helsinki in Finland. The course was retributed by the European commission that already made it available in most of the European languages.

Rationale for this study

Issues related to implementing AI technologies enters the public debates in Europe and in Norway. No one can tell now how AI will develop in the future and therefore we need to make proper policies that will make the societal impact evolve the way we prefer. That is, the technologies have to be trustworthy, which includes being legally and ethically acceptable, safe and effective (1, p2).

An advanced AI system might replace health workers for some of their missions [9]. The benefits could be financial as these machines do not require a salary, will not be tired or sick, and are able to work day and night. This may seem like a great solution, knowing that AI-based diagnoses can sometimes outperform physician's [10]. However, this immediately lifts questions of ethics, especially when applied to the healthcare system, where human contact, empathy and individual attention have been perceived as the ideal of proper care, to name only a few examples [11]. Who is responsible for clinical decisions if AI systems take over [12, 13]? How does an AI system impact on the patient during the care [14]? Will a chat robot, for example, be able to notify all the signs of a patient at risk [12]? Can we assume that the social relation is the same as with a human being [15]? According to the Norwegian Strategy accounted for above, there is an aim to select data from the public sector that cannot be traced to individuals and make it accessible to the private AI's industries. This subject is very sensible. Which data will be considered as sharable [16]? Is this type of data really untraceable ([17],p257)? Should the patient have a word to say about this?

The Norwegian Strategy emphasis the need for a regulated AI that will match with our needs for the future and respect the principles of our societies. In the case of AI, discussions about development, applications and compliance presume that the affected parties can understand what the AI technology can do, what it takes for it to perform as intended and what the implications are for individuals and societies.

AI technology develops rapidly. At the same time, it can fundamentally transform the society as we know it (Bærøe et al [17]). In democracies, it is essential to involve stakeholders in decision-making and allow them to choose. To enable informed participation in national debates, it's important that people can be educated in the discussed field. The government in Norway is already developing a solution to educate the population more about AI and demystify

it. However, to keep on building a robust and trustworthy frame to the development and employment of AI, it is essential for governing authorities to know how knowledgeable people are of AI and what people's attitudes are towards employment of AI technology in general as well as in the different areas of public services such as the health area.

We hypothesis that general knowledge about AI is rather scarce [9] because it's a new technology and it's often working hidden and invisible, and we are often not even conscious of its presence [12]. If there are differences in self-reported knowledge within the population, authorities must find targeted ways to encourage and educate the less knowledgeable to maintain democratic decision-making in this field. Moreover, exploration of people's attitudes towards AI supported healthcare and legal regulation can provide important, preliminary input into further democratic processes.

Related studies

Five studies related to the subject in PubMed and World of science could be found with the keywords AI, Health, awareness, trust, and perception. Other combinations of words were used without success, such as "Health, AI and survey" or "Healthcare, AI and opinion".
One is a qualitative survey study done in France among healthcare workers (and other stakeholders like AI company employees) written by Laï et al and published in 2020. The 40 participants were selected based on their knowledge about AI and healthcare and their demonstration of interest in this field through several symposia. The participants were asked open-ended questions and were allowed to develop their ideas and digress if necessary. The goal was to identify and understand the obstacles to the development of AI in the healthcare system. The main concerns extracted from the survey were[14] (page 5-6):
"

1. Most shared ideas developed during the interviews focused on the myth surrounding AI, the need to find a balance between access to data and their protection, and the potential interference with the physician–patient relationship. […]
2. Healthcare professionals don't deny the promise of AI, but they mostly care about providing the best care for their patients and highlight the gap between public declarations and current practice. […]
3. For healthcare industrial partners, AI is a true break-through and the real challenge is access to health data. […]

4. Participants (…) highlight the imprecision of the notions and the need for education and have major concerns about the role of AI in health, social justice, and freedom. […]
5. Members of regulatory agencies are beginning to take an interest in the subject but appear to be currently overwhelmed. […]
6. Researchers in AI have a pragmatic vision of what AI is and are focused on their own research."

This study differs from the one presented in this thesis on the fact that our study population are residents of Norway in general; not stakeholders who are already concerned, knowledgeable and highly interested in the subject. The results of this study show a common interest in educating people, protecting their data and supporting trustworthy relationships in healthcare services and more precisely between the healthcare worker and the patient.

Another study, released in 2019 in the UK, about the acceptability of AI in healthcare, written by Nadarzynski et al [18] were assessing the participant's willingness to engage with an AI-led health chatbot with a qualitative method based on first, a semi-structured face to face interview and secondly with an online survey in order to explore the motivation to engage with the chatbot. The study conducted on 29 participants was showing a trust related hesitancy ("Many participants (…) were uncertain about the quality, trustworthiness and accuracy of the health information provided by chatbots"), a difficulty to understand the technology behind the bot and worries about a lack of empathy. The chatbot was giving a diagnosis based on symptoms and questions related to general health of the individual.

The opinions on the chatbots were differing in the study group, some were considering the diagnosis as acceptable while some others wouldn't trust the technology as it is too premature to ensure quality. However, 66% of the participants reported that they would only seek a doctor when experiencing health problems, 65% thought the bot was a good idea and 30% didn't like the idea of talking to a computer.

A third study authored by Abdullah, R et al in 2020[9] is exploring the healthcare employee's perception and attitudes towards AI implementation in the work place in Riyadh, Saudi Arabia. The results showed that 3.11 out of 4 of the employees had a lack of knowledge of AI and feared that AI would replace them at work. The respondents were generally unaware of the advantages of AI and required more training in this domain.

Another study written by Yokoi R et al [19], in 2020 opposes trust towards medical doctors with AI through a scenario method with 415 participants. There were 2 options of story-telling

exposing a decision taken by a medical doctor as opposed to a decision taken by an AI and these two scenarios were divided in two other scenarios where the solution proposed was the participant's preferred medicine or the other option of medicine. The perceived value of the decision, the perceived care of the actor and the trust towards the actors were all scoring lower for the AI than for the medical doctor. However, the perceived ability was almost showing no difference between the AI and the doctor's decision. In sum, even though the AI is proposing a solution that is beforehand preferred by the participant, it is perceived as less trustable than the doctor's decision.

The last study was published in Norway in 2020 by Gran et al[12]. They wanted to find out whether being aware of dealing with an algorithm or not corresponds to a new reinforced digital divide. They used a survey of 56 open and close questions on a total of 1624 respondents in Norway to first determine their self-assessed awareness of the algorithms while surfing on the internet and then their attitudes towards these algorithms. Their results show a very scarce awareness with 40.6% of the respondents self-assessing no awareness at all on a Likert scale answer of 5 shades. The second part of the analysis revealed 6 different attitudes towards algorithms, the unaware representing 40.6% of the pie chart, the uncertain (12.5%), the affirmative (11.6%) mostly positive towards algorithms, the neutral (10.8%), the sceptic (14.4%) and the critical (10%).

Using google scholar and following the newsletters about AI helped to find other related studies that were newly released or not accessible on PubMed.

Promberger & Baron have written in 2006 [20], a study highlighting that the subjects of his study trust more physicians than computer program when it comes to make a recommendation or make a decision in health.

In the "resistance to Medical Artificial Intelligence" written by Longoni et al [21], several studies are revealing that the subjects are perceiving negatively the actions of an automated agent as opposed to a human agent. They also show that the decisions provided by automated agents are perceived as less unique. Uniqueness neglect mediates resistance to medical AI. This resistance due to the lack of uniqueness disappears when the automated agent is a support to a human provider.

The reluctance to use or trust decisions based on AI can also come from the difficulty to understand how the AI works and from the illusory understanding of human decision making according to Cadario et al [10].

When it comes to comparing the perceived reliability of AI by genders or education level groups, the study written by Hillesheim et al in 2017 [15] indicates that females trust the automated care agent less and the more educated subjects would trust it more.
According to wang et al (2018, [22]), personality, institution, cognition, knowledge, and calculative factors have an impact on initial and continuous trust. They also associate reinforcement of trust with recursive positive experience of AI.

These studies support the need for establishing a trustworthy AI, educate people about this technology, and targets a need for education. Empirical research on people's attitudes towards AI in health is only in its infancy, our proposed study will help fill that gap of knowledge, especially when it comes to compare the knowledge about AI with wealth or the desire for legal regulation which has not been researched at all according to this research for relevant literature.

7. Objectives

The overall aim of this exploratory study is to study the possible relationships between demographic background variables and people's understanding of AI, some central ethical concerns about AI in health and the need for legal regulation.

The result of this study can be fed into a further process of research to better target education towards those who assess themselves to be less knowledgeable about how AI works. Furthermore, people's attitudes towards using AI in health care settings and the need for legal regulations of such technologies, are all important inputs into political decision-making on developing and implementing trustworthy technologies.

The link to the online course provided by the government was given in the end of the questionnaire so that the participants can obtain more information about AI and health if interested. This could help achieving two other sub-goals:

- To inform people about AI and health.
- To raise awareness towards ethical issues associated with Ai in health.

8. Methods

Study design

This exploratory study will be based on a quantitative survey deployed by Norstat through its representative panel of Norwegian residents in August 2020.

Statistical analysis of the results of each question has been used to explore the self-assessed level of knowledge of the citizens of Norway and their attitudes towards implementation of AI in healthcare contexts.

4 background variables have been considered as interpretable and of interest in this study:

- ✓ Age
- ✓ Gender
- ✓ Household income
- ✓ Education

This questionnaire, called "Webbus" by Norstat is described below (appendices 1 and 2).

The questionnaire has been coded in a way that it is not possible to ignore a question, and it has also prevented from selecting several answers per question.

Study setting

The data collection was done by the international and well-renowned company; Norstat. Background questions about socio-economic factors and geography are standard formulations provided by the company. The data collection routine made use of sampling quotas based on known population parameters such as gender, age, education, residence, and income. When a background variable is well represented in the pool of respondents, the survey will not be presented anymore to more respondents with the same background variable to obtain a population representative sample. The survey consists of approximately 1000 respondents, which are drawn from Norstat's respondent panel, consisting of 81,000 Norwegians [23]. This Norstat panel is primarily recruited via country-representative telephone surveys (thus, no self-selection).

Study population

The target population consists of permanent residents of Norway over 15 years old. The participants will need access to internet. 97% of the households of Norway have access to

internet. Internet access is therefore marginally affecting the representativeness of the panel. The study population represents approximately 82.04 % of the total population of Norway (over 15 years old according to "indexmondi.com"). Based on the recruitment strategy of Norstat, the exclusion criteria were respondents who are under 15 years old, or who don't understand written Norwegian, or who are not residing in Norway.

Data collection

The data collection occurred in august 2020. The data is anonymous and was delivered in august 2020 by Norstat to the Department of Global Health and Primary Care (with Kristine Bærøe as project leader).

Data analysis

The data provided by Norstat did not provide with information about the statistical tests, the corrections, whether "I don't know" answers were excluded or not etc. So, the whole study was remade on Python® in the first semester of 2020 by myself. This allowed me to use the first question's answers as an independent variable for the other questions.

The accepted margin of error will be 5%, the confidence level will be 95% and the power will be 0.8. With these parameters, the minimum sample size should be 384. In total, 1015 respondents have contributed.

Descriptive analysis

After cleaning, translating and organizing the data, a descriptive analysis was performed, showing all the results sorted per question for the whole sample and then per group according to the background variables.

The answers "I don't know" were kept in the descriptive analysis, we therefore count 1015 respondents per background variable.

Statistical analysis

In this analysis, the 'I don't know" answers were removed, resulting in datasets of 861 to 957 answers per questions. The Likert scale answers is associated to a number from 1 to 5 (1 : strongly disagree to 5 : strongly agree) in order to run the tests.

The first part describes the distribution of the results of the question that is analysed (mean, 95% CI, SD, SE).

The second part highlights the possible significant differences between the subgroups of each of the 4 variables with a one-way ANOVA called "Kruskal-Wallis test" (K-W).

Finally, a multiple comparison test of Tuckey (HSD) specifies which sub-groups are standing out from each other. The gender has only 2 sub-groups and therefore doesn't require a multi comparison test.

Ethical consideration

The survey does not involve sensitive health data, only people's attitudes towards health issues so an application to the regional ethical committee was not required. A short introduction written in the beginning of the survey stated the general goal of the survey and explained that participation is voluntary, the result anonymous, the participant can decide to stop filling the survey at any moment. All the gathered data is anonymous when delivered and does not contain any sensitive information or any information that might cause any adverse effect on the respondents. Norstat is ensuring data protection according to laws and regulations of Norway on e-health and data and the European GDPR compliance [24]. The study was registered on the RETTE app in 2020.

The affirmations of the survey

The original questionnaire was in Norwegian and can be found in the appendices 1 and 2. The order of the affirmations was randomized for each respondent.

1- I understand what the AI technology is about.
2- I understand how AI can contribute to an efficient healthcare service.
3- I think that the use of AI-based robots with elders can create ethical challenges.
4- I believe that medical doctor's decisions based on AI contribute to a good treatment.
5- I believe that decisions directly based on AI contribute to a good treatment.
6- I think we should have laws limiting the use of AI in the healthcare system.

The answer options for each of the questions were presented as follows:

To what extent do you agree with the following affirmations ?						
Affirmation (randomized)	I strongly disagree	I moderately disagree	I do not agree nor disagree	I moderately agree	I strongly agree	I don't know

The questionnaire contains only 10 questions to prevent from loss of concentration. In my analysis, only 6 of the 10 questions are included because the other questions were not related to AI in health[5].

9. Results

Descriptive analysis

The distributions of the background variables are displayed in the Table 1.

Distribution of Ages

The biggest group is 60+ and occupies 28% of the spectre.

Distribution of Genders

The subgroups are comparable in size with 7% more females, so a difference of 3.5% to a perfect distribution.

Distribution of Household incomes

The group 0 to 0.5 includes the extremely low revenues. The extremely high incomes are represented by the subgroup 1.5+ with 6 % and the median subgroup is then 0.5 to 1 with 37%. It's a normal distribution and the high number of respondents makes it more reliable.

Distribution of Education

The repartition of education levels is as follows: Primary, Secondary, Post-secondary from 1 to 3 years, Post-secondary from 3 to 4 years, Post-secondary 5 years and more and other.
The median group is "Secondary" with a scarcity towards the highly educated respondents. 146 (14.3%) have answered "Other", which is a substantial part of the pie chart without proper indication. After comparison with the website SSB.no (https://www.ssb.no/en/utniv/), we can conclude that our distribution of the educational levels is quite similar and therefore still representative despite the lack of proper information for 146 participants. In their chart (SSB.no), the Secondary group represents exactly 37% of the population too. The "Primary"

[5] The 4 last questions are related to societal issue and AI and are studied in another paper to come.

group consists of 25.3% of the respondents, which makes it 5% higher in this study. And finally, the biggest difference is on the primary group with 20% instead of 25.3 (SSB.no in 2019).

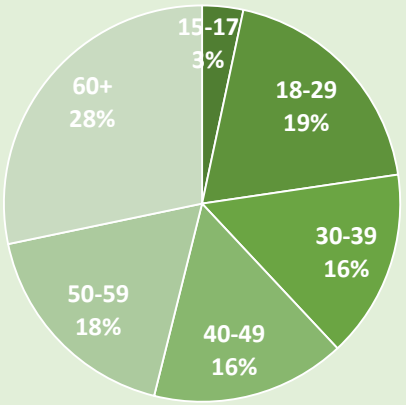
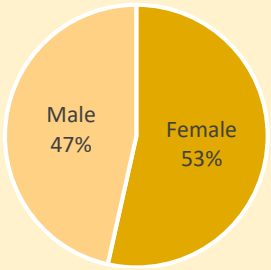
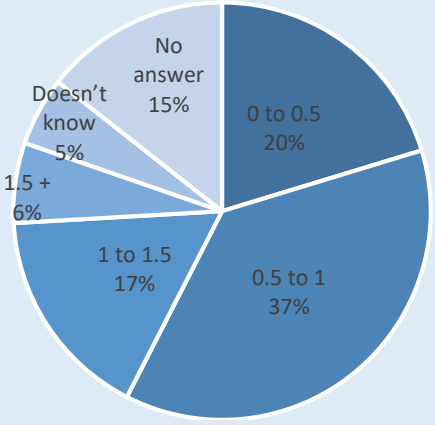
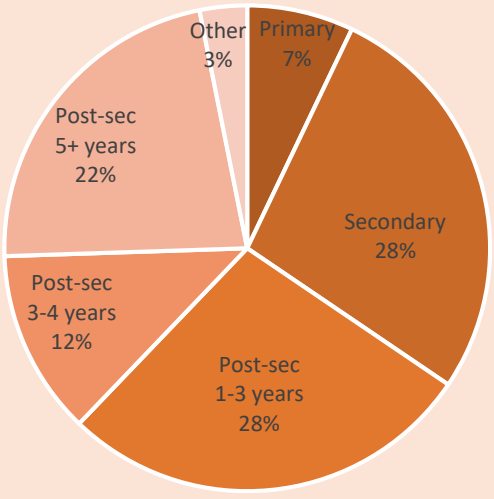
	Sub-group	*n*	*%*	*Distribution of the sub-groups*
Age	*15-17*	34	0.033498	
	18-29	196	0.193103	
	30-39	156	0.153695	
	40-49	161	0.158621	
	50-59	181	0.178325	
	60+	287	0.282759	
	Total	1015	1	
Gender	*Female*	543	0.534975	
	Male	472	0.465025	
	Total	1015	1	
Household income (Million NOK)	*0 to 0.5*	206	0.202956	
	0.5 to 1	378	0.372414	
	1 to 1.5	168	0.165517	
	1.5 +	63	0.062069	
	Doesn't know	54	0.053202	
	No answer	146	0.143842	
	Total	1015	1	
Education	*Primary*	72	0.070936	
	Secondary	278	0.273892	
	Post-sec 1-3 years	281	0.276847	
	Post-sec 3-4 years	125	0.123153	
	Post-sec 5+ years	227	0.223645	
	Other	32	0.031527	
	Total	1015	1	

Table 1: Distribution of the background variables in the dataset.

Statistical analysis

For each question, the following hypothesis will be tested.

H0: The Age of the respondents has no influence on the answers.

H0: The Gender of the respondents has no influence on the answers.

H0: The Household income of the respondents has no influence on the answers.

H0: The Education of the respondents has no influence on the answers.

The answers "Doesn't know" are excluded from the following tests to determine the differences between the groups. The answers are coded on a scale from 1 to 5 to perform the tests.

Question 1 (I understand what the AI technology is about)

Overview of the answers to the question 1:

Answers Q-1	*Scale*	*n*	*%*
Strongly agree	5	196	0.193103
Somewhat agree	4	379	0.373399
Neither agree nor disagree	3	165	0.162562
Somewhat disagree	2	119	0.117241
Strongly disagree	1	58	0.057143
Doesn't know		(98)	0.096552
Total		917 (1015)	1

Distribution of the answers (n = 917)

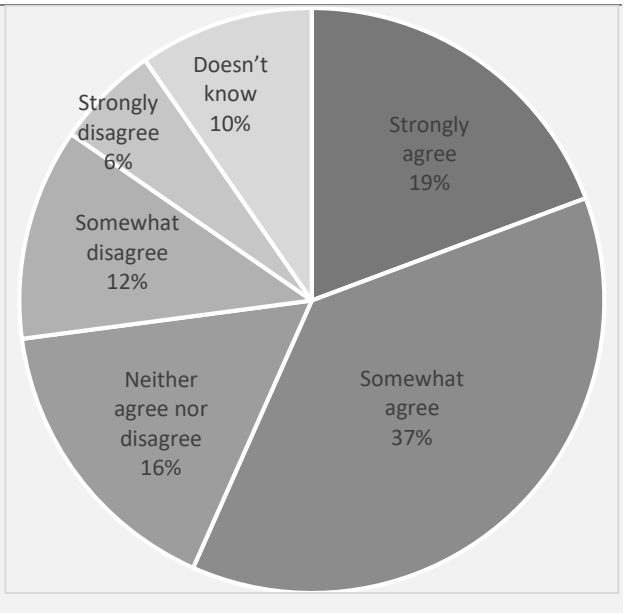


Table 2: Distribution of the answers to question 1

The mean for the question 1 is 3.5845 (±1.1449) between the neutral answer and somewhat agree. Thus, on average, people in Norway report to have some knowledge of AI.

The Kruskal-Wallis test shows that there is a significant difference between the subgroups of age (p-v = 1.99e-05), gender (p-v =1.36e-4), household income (p-v = 1.56e-2) and education (p-v = 6.22e-4). Furthermore, and as shown in the table 3, we can reject all the null hypothesis.

It's now time to use the Tuckey HSD test to determine the precise difference between the sub-groups of each category. Only the significant comparisons with the test of Tuckey HSD ($\alpha = 0.05$) are kept. All the results of the Tuckey HSD are summarized in the appendix n°32.

Variable	*Sub-group*	*n*	*Mean*	*SD*	*SE*	*95% Conf.*	*Interval*	*P-value K-W*
Question 1		**917.0**	**3.5845**	**1.1449**	**0.0378**	**3.5103**	**3.6587**	*
Age	*15-17*	28	**3.4643**	1.3189	0.2492	2.9529	3.9757	**1.99e-05**
	18-29	174	**3.8103**	1.1599	0.0879	3.6368	3.9839	
	30-39	146	**3.6986**	1.1883	0.0983	3.5043	3.8930	
	40-49	149	**3.6913**	1.0648	0.0872	3.5189	3.8637	
	50-59	159	**3.5723**	1.1388	0.0903	3.3939	3.7507	
	60 +	261	**3.3295**	1.0984	0.0680	3.1956	3.4634	
Gender	*Male*	469	**3.4371**	1.1852	0.0547	3.3296	3.5446	**1.36e-4**
	Female	448	**3.7388**	1.0811	0.0511	3.6385	3.8392	
Household income *(in million NOK)*	*0-0.5M*	191	**3.4136**	1.1660	0.0844	3.2472	3.5800	**1.56e-2**
	0.5M-1M	349	**3.5645**	1.1394	0.0610	3.4445	3.6844	
	1M-1.5M	160	**3.8438**	1.0731	0.0848	3.6762	4.0113	
	1.5M+	58	**3.6034**	1.2970	0.1703	3.2624	3.9445	
	Doesn't know	43	**3.5814**	1.2195	0.1860	3.2061	3.9567	
	No answer	116	**3.5603**	1.0737	0.0997	3.3629	3.7578	
Education	*Primary*	57	**3.3333**	1.2583	0.1667	2.9995	3.6672	**6.22e-4**
	Secondary	243	**3.4321**	1.2020	0.0771	3.2802	3.5840	
	Post-sec, 1 to 3 years	259	**3.8378**	1.0177	0.0632	3.7133	3.9624	
	Post-sec, 3 or 4 years	119	**3.4538**	1.1256	0.1032	3.2495	3.6581	
	5+ post-sec	213	**3.6244**	1.1450	0.0785	3.4698	3.7791	
	Other	26	**3.3077**	1.2254	0.2403	2.8128	3.8026	

Table 3: Summary of the question 1

Age (Multi-comparisons test)

Conclusion: The group of 60+ respondents has a significantly reports a significantly lower knowledge than the groups 18-29 (p-v = 0.001), 30-39 (p-v = 0.02) and 40-49 (p-v = 0.024).

Gender (Kruskal-Wallis)

There are two genders to compare. The Kruskal-Wallis test is sufficient.

Conclusion: Males report a significantly higher knowledge than females (p-v = 1.36e-4), indicating that they have higher self-reported knowledge.

Household income (Multi-comparisons test)

Conclusion : The group with a household income of 1 Million NOK to 1.5 Million NOK per year reports a significantly higher knowledge of AI than the group with a household income of 0 to 0.5 Million NOK per year (p-v = 0.0006).

Education (Multi-comparisons test)

Conclusion : The group with a post-secondary education of 1 to 3 years reports a significantly higher knowledge of AI than the groups with primary education (p-v = 0.029), secondary education (p-v = 0.001) and post-secondary 3- or 4-years education (p-v = 0.028).

Question 2 (I understand how AI can contribute to an efficient healthcare service)

Answers	*Scale*	*n*	*%*
Strongly agree	5	175	0.172414
Somewhat agree	4	394	0.388177
Neither agree nor disagree	3	158	0.155665
Somewhat disagree	2	99	0.097537
Strongly disagree	1	77	0.075862
Doesn't know		(112)	0.110345
Total		903 (1015)	1

Distribution of answers (n = 903)

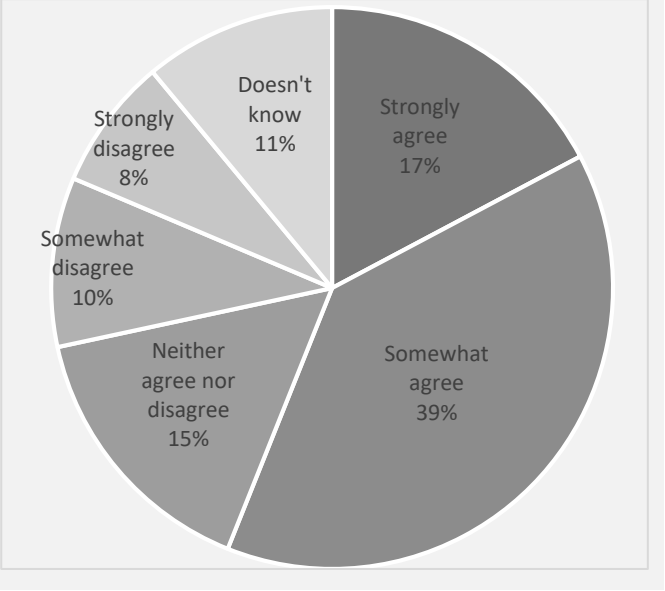


Table 4: Distribution of the answers to question 2

The mean for the question 2 is 3.5437 (±1.1697), between the neutral answer and somewhat agree. Thus, on average, people in Norway report to have some understanding of AI in healthcare. The Kruskal-Wallis shows that there is a significant difference between the subgroups of age (p-v = 1.82e-4), gender (p-v = 0.038), household income (p-v = 0.01) and education (p-v = 0.021). Furthermore, and as shown in the table 5, we can reject all the null hypothesis.

Variable	*Sub-group*	*n*	*Mean*	*SD*	*SE*	*95% Conf.*	*Interval*	*P-value K-W*
Question 2		**903**	**3.5437**	**1.1697**	**0.0389**	**3.4674**	**3.6201**	*
Age	*15-17*	27	**4.1852**	0.8787	0.1691	3.8376	4.5328	**1.82e-4**
	18-29	175	**3.8286**	1.1060	0.0836	3.6636	3.9936	
	30-39	145	**3.6483**	1.1519	0.0957	3.4592	3.8374	
	40-49	142	**3.6479**	1.1374	0.0954	3.4592	3.8366	
	50-59	158	**3.3228**	1.2118	0.0964	3.1324	3.5132	
	60 +	256	**3.3008**	1.1646	0.0728	3.1574	3.4441	
Gender	*Female*	472	**3.4597**	1.1991	0.0552	3.3513	3.5682	**0.038**
	Male	431	**3.6357**	1.1308	0.0545	3.5287	3.7428	
Household income (in million NOK)	*0-0.5M*	188	**3.4309**	1.2369	0.0902	3.2529	3.6088	**0.01**
	0.5M-1M	346	**3.5087**	1.1603	0.0624	3.3860	3.6314	
	1M-1.5M	156	**3.6987**	1.0920	0.0874	3.5260	3.8714	
	1.5M+	58	**3.9310**	1.0573	0.1388	3.6530	4.2090	
	Doesn't know	111	**3.3604**	1.2120	0.1150	3.1324	3.5883	
	No answer	44	**3.7045**	1.1119	0.1676	3.3665	4.0426	
Education	*Primary*	57	**3.6842**	1.1520	0.1526	3.3785	3.9899	**0.021**
	Secondary	249	**3.3735**	1.2153	0.0770	3.2218	3.5252	
	Post-sec, 1 to 3 years	252	**3.6310**	1.1650	0.0734	3.4864	3.7755	
	Post-sec, 3 or 4 years	112	**3.4286**	1.2282	0.1160	3.1986	3.6585	
	5+ post-sec	208	**3.6923**	1.0684	0.0741	3.5463	3.8384	
	Other	25	**3.3200**	1.1446	0.2289	2.8476	3.7924	

Table 5: Summary of the question 2

Age (Multi-comparisons test)

Conclusion : The group of 60 and older respondents reports a significantly lower understanding than the groups 15-17 (p-v = 0.0021), 18-29 (p-v = 0.001), 30-39 (p-v = 0.0427) and 40-49 (p-v = 0.0456). The group of 50-59-year-old respondents reports a significantly lower understanding than the groups 15-17 (p-v = 0.044) and 18-29 (p-v = 0.001).

Gender (Kruskal-Wallis)

Conclusion: The group of males reports a significantly higher understanding than the group of Females (p-v = 3.82e-4).

Household income (Multi-comparisons test)

Conclusion: The group with a household income of 1.5 million NOK and more reports a significantly higher understanding than the group with a household income of 0 to 0.5 Million NOK (p-v = 0.0491).

Education (Multi-comparisons test)

Conclusion: The group with 5 years or more of post-secondary education reports a significantly higher understanding than the group with a secondary education (p-v = 0.0424).

Question 3 (I think that the use of AI-based robots with elders can create ethical challenges)

Answers	*Scale*	*n*	*%*
Strongly agree	5	359	0.353695
Somewhat agree	4	297	0.292611
Neither agree nor disagree	3	133	0.131034
Somewhat disagree	2	120	0.118227
Strongly disagree	1	48	0.047291
Doesn't know		(58)	0.057143
Total		957 (1015)	1

Distribution of answers (n = 957)

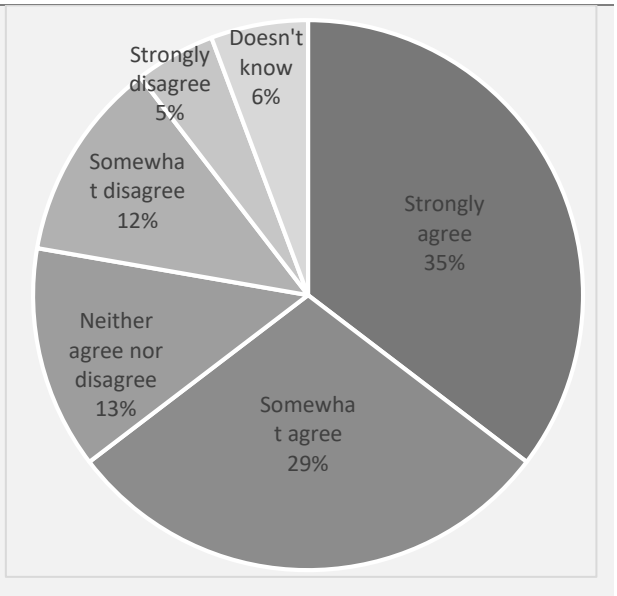


Table 6: Distribution of the answers to the question 3

The mean for the question 1 is 3.83(±1.2006), between the neutral answer and somewhat agree. Thus, on average, people in Norway think that AI-based robots in elder care can create ethical issues. The Kruskal-Wallis test shows that there is a significant difference between the subgroups of age (p-v = 0.003), gender (p-v = 7.59e-5), household income (p-v = 3.1e-2) and education (p-v = 3.1e-2). Furthermore, and as shown in the table 7, we can reject all the null hypothesis.

Variable	*Sub-group*	*n*	*Mean*	*SD*	*SE*	*95% Conf.*	*Interval*	*P-value K-W*
Question 3		**957**	**3.8349**	**1.2006**	**0.0388**	**3.7587**	**3.9111**	*
Age	*15-17*	30	**3.8333**	1.0854	0.1982	3.4280	4.2386	**0.003**
	18-29	183	**3.7814**	1.1796	0.0872	3.6094	3.9535	
	30-39	149	**3.4832**	1.2170	0.0997	3.2862	3.6802	
	40-49	150	**4.0333**	1.1138	0.0909	3.8536	4.2130	
	50-59	171	**3.8187**	1.3359	0.1022	3.6171	4.0204	
	60+	274	**3.9635**	1.1381	0.0688	3.8281	4.0989	
Gender	*Female*	508	**3.9764**	1.1493	0.0510	3.8762	4.0766	**7.59e-5**
	Male	449	**3.6748**	1.2379	0.0584	3.5600	3.7896	
Household income (in million NOK)	*0-0.5M*	200	**4.0000**	1.1208	0.0793	3.8437	4.1563	**3.1e-2**
	0.5M-1M	361	**3.8338**	1.1996	0.0631	3.7096	3.9580	
	1M-1.5M	157	**3.8089**	1.2097	0.0965	3.6182	3.9996	
	1.5M+	61	**3.4590**	1.3853	0.1774	3.1042	3.8138	
	Doesn't know	50	**3.6000**	1.1066	0.1565	3.2855	3.9145	
	No answer	128	**3.8828**	1.2207	0.1079	3.6693	4.0963	
Education	*Primary*	66	**3.7727**	1.1740	0.1445	3.4841	4.0613	**3.1e-2**
	Secondary	264	**4.0000**	1.1634	0.0716	3.8590	4.1410	
	Post-sec, 1 to 3 years	266	**3.8496**	1.2316	0.0755	3.7009	3.9983	
	Post-sec, 3 or 4 years	117	**3.6154**	1.3316	0.1231	3.3716	3.8592	
	5+ post-sec	214	**3.7430**	1.1318	0.0774	3.5905	3.8955	
	Other	30	**3.9000**	1.1250	0.2054	3.4799	4.3201	

Table 7: Summary of the question 3

Age (Multi-comparisons test)

Conclusion : The group of 30-39-year-old respondents reports a significantly lower score than the groups 40-49 (p-v = 0.001) and the groups 60+ (p-v = 0.0011).

Gender (Kruskal-Wallis)

Conclusion: The group of males has a significantly lower score than the group of Females (p-v = 7.59e-5).

Household income (Multi-comparisons test)

Conclusion: The group with a household income of 1.5 million NOK and a significantly lower score than the group with a household income of 0 to 0.5 Million NOK (p-v = 0.0249).

Education (Multi-comparisons test)

Conclusion: The group with 3 to 4 years of post-secondary education has a significantly lower score than the group with a secondary education (p-v = 0.045).

Question 4 (I believe that medical doctor's decisions based on AI contribute to a good treatment)

Answers	*Scale*	*n*	*%*
Strongly agree	5	126	0.124138
Somewhat agree	4	344	0.338916
Neither agree nor disagree	3	185	0.182266
Somewhat disagree	2	143	0.140887
Strongly disagree	1	114	0.112315
Doesn't know		(103)	0.101478
Total		912 (1015)	1

Distribution of answers (n = 912)

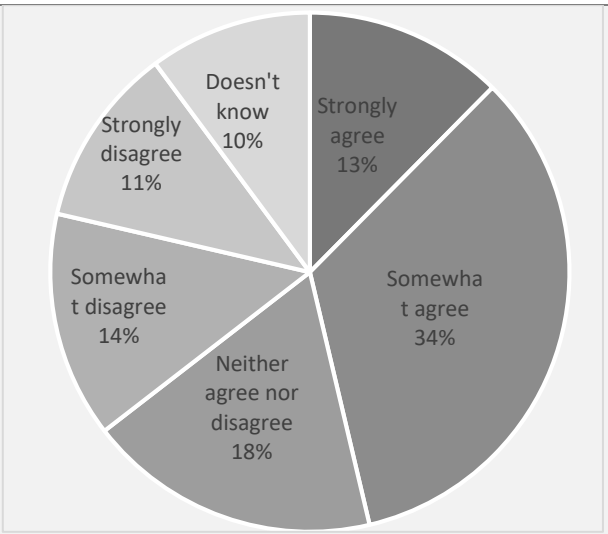


Table 8: Distribution of the answers to the question 4

The mean for the question 4 is 3.25 (±1.2359) between the neutral answer and somewhat agree. Thus, on average, people in Norway believe that medical doctor's decisions based on AI contributes to a good treatment.

The Kruskal-Wallis test shows that there is a significant difference between the subgroups of age (p-v = 5.3e-05), gender (p-v =0.009), household income (p-v = 3.1e-3) and education (p-v = 4.4e-4). Furthermore, and as shown in the table 9, we can reject all the null hypothesis.

Variable	*Sub-group*	*n*	*Mean*	*SD*	*SE*	*95% Conf.*	*Interval*	*P-value K-W*
Question 4		**912**	**3.2467**	**1.2359**	**0.0409**	**3.1664**	**3.327**	*****
Age	*15-17*	27	**3.8148**	0.8787	0.1691	3.4672	4.1624	**5.3e-5**
	18-29	171	**3.5263**	1.1289	0.0863	3.3559	3.6967	
	30-39	140	**3.5000**	1.2779	0.1080	3.2865	3.7135	
	40-49	146	**3.1575**	1.1959	0.0990	2.9619	3.3532	
	50-59	165	**2.9818**	1.2806	0.0997	2.7850	3.1787	
	60+	263	**3.0875**	1.2371	0.0763	2.9372	3.2377	
Gender	*Female*	470	**3.1468**	1.2207	0.0563	3.0362	3.2575	**0.009**
	Male	442	**3.3529**	1.2444	0.0592	3.2366	3.4693	
Household income (in million NOK)	*0-0.5M*	186	**3.1022**	1.2543	0.0920	2.9207	3.2836	**3.1e-3**
	0.5M-1M	354	**3.2373**	1.1950	0.0635	3.1124	3.3622	
	1M-1.5M	154	**3.3182**	1.2351	0.0995	3.1216	3.5148	
	1.5M+	55	**3.8182**	1.0731	0.1447	3.5281	4.1083	
	doesn't know	48	**3.4167**	1.1639	0.1680	3.0787	3.7546	
	No answer	115	**3.0696**	1.3554	0.1264	2.8192	3.3200	
Education	*Primary*	60	**3.3167**	1.1122	0.1436	3.0294	3.6040	**4.4e-2**
	Secondary	249	**3.0924**	1.2903	0.0818	2.9313	3.2534	
	Post-sec, 1 to 3 years	259	**3.2085**	1.2740	0.0792	3.0526	3.3644	
	Post-sec, 3 or 4 years	114	**3.2807**	1.1637	0.1090	3.0648	3.4966	
	5+ post-sec	206	**3.4660**	1.1755	0.0819	3.3045	3.6275	
	Other	24	**3.0417**	1.1971	0.2444	2.5362	3.5471	

Table 9: Summary of the question 4

Age (Multi-comparisons test)

Conclusion : The group of 50-59-year-old respondents reports a significantly lower trust in the decisions based on AI and reviewed by a medical doctor than the groups 15-17 (p-v = 0.0129), the group 18-29 (p-v = 0.001) and the groups 30-39 (p-v = 0.003).

The group of 60+ reports a significantly lower trust in the decisions based on AI and reviewed by a medical doctor than the groups 15-17 (p-v = 0.0373), the group 18-29 (p-v = 0.0035) and the groups 30-39 (p-v = 0.0156).

Gender (Kruskal-Wallis)

Conclusion: The group of males reports a significantly higher trust in the decisions based on AI and reviewed by a medical doctor than the group of Females (p-v = 0.009).

Household income (Multi-comparisons test)

Conclusion: The group with a household income of 1.5 million NOK and more reports a significantly higher trust in the decisions based on AI and reviewed by a medical doctor than the group with a household income of 0 to 0.5 Million NOK (p-v = 0.0021) and the group with a household income of 0.5 to 1 Million NOK (p-v = 0.0143).

Education (Multi-comparisons test)

Conclusion: The group with 5 years of post-secondary education and more reports a higher trust in the decisions based on AI and reviewed by a medical doctor than the group with a secondary education (p-v = 0.0166).

Question 5 (I believe that decisions directly based on AI contribute to a good treatment)

Answers	*Scale*	*n*	*%*
Strongly agree	5	37	0.036453
Somewhat agree	4	140	0.137931
Neither agree nor disagree	3	156	0.153695
Somewhat disagree	2	294	0.289655
Strongly disagree	1	303	0.298522
Doesn't know		(85)	0.083744
Total		930 (1015)	1

Distribution of answers (n = 930)

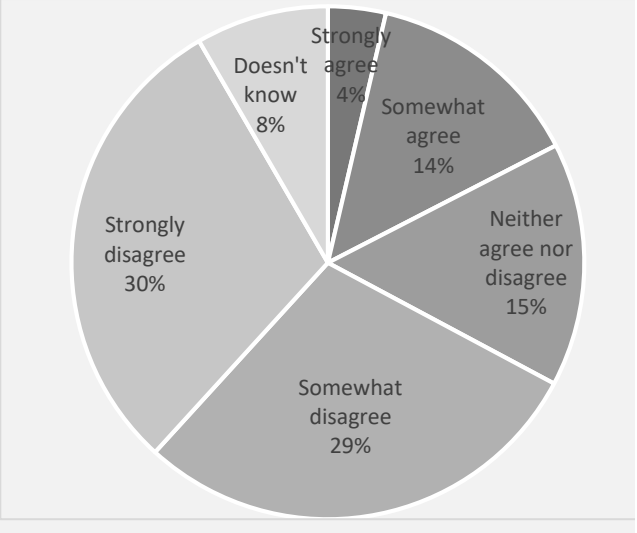


Table 10: Distribution of the answers to the question 5

The mean for the question 4 is 2.26 (±1.1775) between somewhat disagree and the neutral answer. Thus, on average, people in Norway do not believe that decisions directly based on AI contribute to a good treatment. The Kruskal-Wallis test shows that there is a significant difference between the subgroups of age (p-v = 2.2e-05), gender (p-v =1.5e-8), household

income (p-v = 1.5e-4) **but not** between the sub-groups of education (p-v = 0.221). Furthermore, and as shown in the table 11, we can reject the 3 first null hypothesis.

Variable	*Sub-group*	*n*	*Mean*	*SD*	*SE*	*95% Conf.*	*Interval*	*P-value K-W*
Question 5		**930**	**2.2624**	**1.1775**	**0.0386**	**2.1866**	**2.3381**	*****
Age	*15-17*	28	**2.9643**	1.0709	0.2024	2.5490	3.3795	**2.2e-5**
	18-29	175	**2.4800**	1.1539	0.0872	2.3078	2.6522	
	30-39	145	**2.4483**	1.2524	0.1040	2.2427	2.6539	
	40-49	146	**2.0685**	1.1546	0.0956	1.8796	2.2574	
	50-59	166	**2.0904**	1.1272	0.0875	1.9176	2.2631	
	60+	270	**2.1593**	1.1506	0.0700	2.0214	2.2971	
Gender	*Female*	486	**2.0329**	1.0329	0.0469	1.9409	2.1250	**1.5e-8**
	Male	444	**2.5135**	1.2721	0.0604	2.3949	2.6322	
Household income (in million NOK)	*0-0.5M*	189	**2.1587**	1.1042	0.0803	2.0003	2.3172	**1.5e-4**
	0.5M-1M	354	**2.2655**	1.1625	0.0618	2.1440	2.3871	
	1M-1.5M	158	**2.1835**	1.1446	0.0911	2.0037	2.3634	
	1M-1.5M	158	**2.1835**	1.1446	0.0911	2.0037	2.3634	
	doesn't know	47	**2.6596**	1.0483	0.1529	2.3518	2.9674	
	No answer	125	**2.0880**	1.2314	0.1101	1.8700	2.3060	
Education	*Primary*	60	**2.4500**	1.1706	0.1511	2.1476	2.7524	**0.2221**
	Secondary	258	**2.2364**	1.1444	0.0712	2.0961	2.3767	
	Post-sec, 1 to 3 years	263	**2.3726**	1.2471	0.0769	2.2212	2.5240	
	Post-sec, 3 or 4 years	113	**2.1504**	1.0956	0.1031	1.9462	2.3547	
	5+ post-sec	209	**2.2057**	1.1811	0.0817	2.0447	2.3668	
	Other	27	**1.9259**	1.0350	0.1992	1.5165	2.3354	

Table 11: Summary of the question 5

Age (Multi-comparisons test)

Conclusion : The group of 15-17-year-old respondents reports a significantly higher trust in AI's decisions than the group 40-49 (p-v = 0.0027), the group 50-59 (p-v = 0.0033) and the groups 60+ (p-v = 0.0067).

The group of 18-29 reports a significantly higher trust in AI's decisions than the group 40-49 (p-v = 0.0202) and the group 50-59 (p-v = 0.0247).

Gender (Kruskal-Wallis)

Conclusion: The group of males reports a significantly higher trust in AI's decisions than the group of Females (p-v = 1.5e-8).

Household income (Multi-comparisons test)

Conclusion: The group with a household income of 1.5 million NOK and more reports a significantly higher trust in AI's decisions than the group with a household income of 0 to 0.5 Million NOK (p-v = 0.001), the group with a household income of 0.5 to 1 Million NOK (p-v = 0.005) and the groups with a household income of 1 to 1.5 million NOK (p-v = 0.0025).

Question 6 (I think we should have laws regulating the use of AI in the healthcare system)

Answers	*Scale*	*n*	*%*
Strongly agree	5	444	0.437438
Somewhat agree	4	304	0.299507
Neither agree nor disagree	3	115	0.113300
Somewhat disagree	2	49	0.048276
Strongly disagree	1	28	0.027586
Doesn't know		(75)	0.073892
Total		940 (1015)	1

Distribution of answers (n = 940)

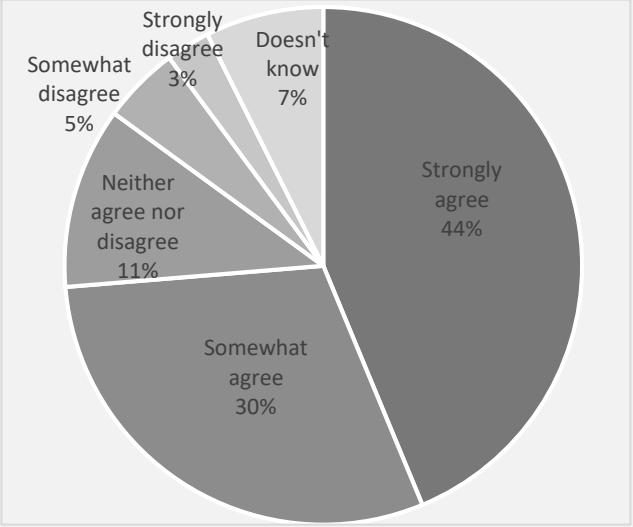


Table 12: Distribution of the answers to the question 6

The mean for the question 4 is 4.1564 (±1.0237) between somewhat agree and strongly agree. Thus, on average, people in Norway report a desire for legal regulation of AI in healthcare.
The Kruskal-Wallis test shows that there is a significant difference between the subgroups of age (p-v = 4.2e-2), gender (p-v =2.1e-4), household income (p-v = 9.6e-4) **but not** between the sub-groups of education (p-v = 6.1e-2). Furthermore, and as shown in the table 13, we can reject the 3 first null hypothesis.

Variable	*Sub-group*	*n*	*Mean*	*SD*	*SE*	*95% Conf.*	*Interval*	*P-value K-W*
Question 6		**940**	**4.1564**	**1.0237**	**0.0334**	**4.0909**	**4.2219**	*****
Age	*15-17*	28	**3.6786**	1.2781	0.2415	3.1830	4.1742	**4.2e-2**
	18-29	179	**4.1229**	0.9400	0.0703	3.9843	4.2616	
	30-39	143	**4.0280**	1.0677	0.0893	3.8515	4.2045	
	40-49	149	**4.3020**	0.9494	0.0778	4.1483	4.4557	
	50-59	169	**4.1657**	1.0504	0.0808	4.0062	4.3252	
	60+	272	**4.2096**	1.0328	0.0626	4.0863	4.3328	
Gender	*Female*	493	**4.2860**	0.9203	0.0414	4.2046	4.3674	**2.1e-4**
	Male	447	**4.0134**	1.1104	0.0525	3.9102	4.1166	
Household income (in million NOK)	*0-0.5M*	195	**4.1949**	0.9807	0.0702	4.0564	4.3334	**9.6e-4**
	0.5M-1M	356	**4.1910**	1.0387	0.0551	4.0827	4.2993	
	1M-1.5M	161	**4.0807**	1.0427	0.0822	3.9185	4.2430	
	1.5M+	57	**4.0526**	1.0761	0.1425	3.7671	4.3381	
	Doesn't know	45	**3.6222**	1.1137	0.1660	3.2876	3.9568	
	No answer	126	**4.3333**	0.9033	0.0805	4.1741	4.4926	
Education	*Primary*	64	**3.8281**	1.1486	0.1436	3.5412	4.1150	**6.1e-2**
	Secondary	256	**4.1680**	1.0209	0.0638	4.0423	4.2936	
	Post-sec, 1 to 3 years	265	**4.2340**	0.9721	0.0597	4.1164	4.3515	
	Post-sec, 3 or 4 years	116	**4.2500**	1.0119	0.0940	4.0639	4.4361	
	5+ post-sec	210	**4.0810**	1.0573	0.0730	3.9371	4.2248	
	Other	29	**4.2414**	0.9124	0.1694	3.8943	4.5884	

Table 13: Summary of the question 6

Age (Multi-comparisons test)

Conclusion : The group of 15-17-year-old respondents report a significantly lower desire for legal regulation than the group 40-49 (p-v = 0.0027).

Gender (Kruskal-Wallis)

Conclusion: The group of males reports a significantly lower desire for legal regulation than the group of Females (p-v = 2.1e-4).

Household income (Multi-comparisons test)

Conclusion: The group that doesn't know its household income reports a significantly lower desire for legal regulation than the group with a household income of 0 to 0.5 Million NOK (p-v = 0.0089), the group with a household income of 0.5 to 1 Million NOK (p-v = 0.0057) and the group that did not want to answer about its household income(p-v = 0.001).

Using question 1 (I understand what the AI technology is about) as an independent variable

I wanted to know how the respondents answered the questions 2 to 6 according to their knowledge of AI. I have basically used the same tests again on the questions 2 to 6 with the results to the question 1 as an independent variable.

The answers "I don't know" have been excluded from the analysis, resulting in different sample sizes for each analysis. The following hypothesis will be tested for the questions 2 to 6.

H0: The self-assessed knowledge of AI has no influence on the answers to the questions 2 to 6.

The summary of all the significant comparisons is in the appendix n°33.

Comparison to question 2 (I understand how AI can contribute to an efficient healthcare service)

Answers to Q1	*Scale*	*n*	*Mean at Q2*	*SD*	*SE*	*95% conf*	*interval*	*K-W*
Strongly agree	5	193	**4.0415**	1.2283	0.0884	3.8671	4.2158	
Somewhat agree	4	364	**3.7802**	0.9569	0.0502	3.6816	3.8789	
Neither agree nor disagree	3	153	**3.1830**	0.9897	0.0800	3.0249	3.3411	**1.18e-32**
Somewhat disagree	2	107	**3.1308**	1.0823	0.1046	2.9234	3.3383	
Strongly disagree	1	50	**2.1800**	1.3200	0.1867	1.8049	2.5551	
Total		867						

Table 14: Results to question 2 with question 1 as an independent variable

The Kruskal-Wallis test shows that there is a significant difference between the groups of self-assessed knowledge of AI (p-v = 1.18e-32).

The multi comparison test of Tuckey (HSD) revealed that all the groups are significantly different except for the groups that have answered neutrally and "Somewhat disagree" to the question 1. The corresponding boxplot (appendix n°27) shows that the groups have globally answered the same answer to both the first and the 2nd question. Thus, on average, the less knowledgeable about AI are also understanding less how AI can contribute to a good healthcare service. The opposite for the more knowledgeable is also globally true.

Comparison to question 3 (I think that the use of AI-based robots with elders can create ethical challenges)

Answers to Q1	*Scale*	*n*	*Mean at Q2*	*SD*	*SE*	*95% conf*	*interval*	*K-W*
Strongly agree	5	193	**3.5959**	1.3549	0.0975	3.4035	3.7882	
Somewhat agree	4	368	**3.7745**	1.1722	0.0611	3.6543	3.8946	
Neither agree nor disagree	3	161	**4.0000**	1.0368	0.0817	3.8386	4.1614	**0.03**
Somewhat disagree	2	117	**3.9744**	1.0864	0.1004	3.7754	4.1733	
Strongly disagree	1	53	**3.9057**	1.4447	0.1984	3.5075	4.3039	
Total		892						

Table 15: Results to question 3 with question 1 as an independent variable

The Kruskal-Wallis test shows that there is a significant difference between the groups of self-assessed knowledge from question 1 (p-v = 0.03).

The multi comparison test of Tuckey (HSD) revealed that the groups that have answered neutrally and "strongly agree" are significantly different (p-v = 0.0141).

Comparison to question 4 (I believe that medical doctor's decisions based on AI contribute to a good treatment)

Answers to Q1	*Scale*	*n*	*Mean at Q2*	*SD*	*SE*	*95% conf*	*interval*	*K-W*
Strongly agree	5	191	**3.3874**	1.3714	0.0992	3.1917	3.5832	
Somewhat agree	4	359	**3.3983**	1.1507	0.0607	3.2789	3.5178	
Neither agree nor disagree	3	156	**2.9936**	1.1042	0.0884	2.8189	3.1682	**2.87e-4**
Somewhat disagree	2	109	**3.2936**	1.0741	0.1029	3.0896	3.4975	
Strongly disagree	1	46	**2.8696**	1.5291	0.2255	2.4155	3.3237	
Total		861						

Table 16: Results to question 4 with question 1 as an independent variable

The Kruskal-Wallis test shows that there is a significant difference between the different groups of self-assessed knowledge at question 1 (p-v = 2.87e-4).

The multi comparison test of Tuckey (HSD) revealed that the less knowledgeable group would trust less decisions based on AI and reviewed by a medical doctor than the group that has answered "somewhat agree" to the first question (p-v = 0.0424). It has also revealed that the group that has answered neutrally to the first question has scored significantly lower than the groups that have answered "somewhat agree" (p-v = 0.0406) and "strongly agree" to the first question (p-v = 0.0219). The group "somewhat disagree" doesn't confirm the tendency to score lower to the question 3 when being less knowledgeable about AI.

Comparison to question 5 (I believe that decisions directly based on AI contribute to a good treatment)

Answers to Q1	*Scale*	*n*	*Mean at Q2*	*SD*	*SE*	*95% conf*	*interval*	*K-W*
Strongly agree	5	190	**2.4579**	1.3592	0.0986	2.2634	2.6524	
Somewhat agree	4	368	**2.3478**	1.1454	0.0597	2.2304	2.4652	
Neither agree nor disagree	3	159	**2.2453**	1.0950	0.0868	2.0738	2.4168	**0.001**
Somewhat disagree	2	112	**1.9821**	0.9678	0.0914	1.8009	2.1634	
Strongly disagree	1	48	**1.8542**	1.2202	0.1761	1.4999	2.2085	
Total		877						

Table 17: Results to question 5 with question 1 as an independent variable

The Kruskal-Wallis test shows that there is a significant difference between the groups of self-assessed knowledge from question 1 (p-v = 0.001).

The multi comparison test of Tuckey (HSD) revealed that the group that has answered "strongly disagree" to the question 1 trust significantly less the decisions directly based on AI than the groups that have answered "somewhat agree" (p-v = 0.0479) and "strongly agree" (p-v = 0.0126).

It has also revealed that the group that has answered "somewhat disagree" to the first question trust significantly less the decisions directly based on AI than the groups that have answered "somewhat agree" (p-v = 0.0316) and "strongly agree" (p-v = 0.006).

This shows clearly that the less knowledgeable would trust less the decisions directly processed by AI.

Comparison to question 6 (I think we should have laws regulating the use of AI in the healthcare system)

Answers to Q1	*Scale*	*n*	*Mean at Q2*	*SD*	*SE*	*95% conf*	*interval*	*K-W*
Strongly agree	5	191	**4.1571**	1.1591	0.0839	3.9916	4.3225	
Somewhat agree	4	370	**4.1432**	1.0140	0.0527	4.0396	4.2469	
Neither agree nor disagree	3	161	**4.0932**	0.9206	0.0726	3.9499	4.2365	**0.418**
Somewhat disagree	2	113	**4.1770**	0.9086	0.0855	4.0076	4.3463	
Strongly disagree	1	50	**4.0600**	1.3463	0.1904	3.6774	4.4426	
Total		885						

Table 18: Results to question 6 with question 1 as an independent variable

The Kruskal-Wallis test shows that there is no significant difference between the different groups of self-assessed knowledge at question 1 (p-v = 0.418)

The multi comparison test of Tuckey (HSD) did not reveal any difference between the groups either. Thus, on average, all the groups of self-assessed knowledge about AI have the same desire for a legal regulation of AI in health.

10. Discussion

The general observation

The first interesting finding is based on the general responses to the questions. Let's keep in mind that the scale used for the analysis goes from 1 to 5, meaning that the median value of the spectre is 3. The 2 first questions have an average score well over 3 with a mean of respectively 3.5845 (±1.1449 with 19% of "strongly agree" and 37% of "somewhat agree") for the understanding of AI and 3.5437 (±1.1697 with 17 % of "strongly agree" and 39% of "somewhat agree") on the question about ho AI can contribute to an efficient healthcare service. This shows that, overall, the self-assessed knowledge about AI is not as low as expected[9, 10, 14]. This was unexpected, especially when comparing these results to the findings of Gran et al[12]. According to their survey, 40.6% is unaware of the algorithms they use (this study was exploring the awareness of internet users towards the hidden algorithms they could use every day without forcedly noticing it), and thus indicating lack of general knowledge for AI.

When we introduce the issue of AI based elder care with the question 3, the mean rises to 3.83 (±1.2006 with 35% of "strongly agree" and 29% of somewhat agree) agreeing with the presence of ethical issues about AI and elder's care. When we introduce the concept of doctors' decision based on AI in the question 4, the mean is 3.25 (±1.2359 with 13% of "strongly agree" only, 34% of "somewhat agree" and 18% of neutral). The ratio is still positive, meaning that the respondent would possibly trust doctors' decisions based on AI. However, when we introduce the concept of healthcare decisions only based on AI, without the review of a physician, we observe a mean score of 2.26 (±1.1775 with 30% of "Strongly disagree", 29% of "somewhat disagree" and 15% of neutral) indicating that the sample does generally not have full confidence in AI's decisions. This result correlates with the high ratio of hesitancy and trust issues observed in the study conducted by Nardazynski et al [18]. It also fits perfectly with the findings in the paper authored by Yokoi et al and Longoni et al [19, 21] saying that trust in AI is higher when it's only a support for the decision making. The study of Gran et al [12], shows a ratio of scepticism of 14% and trust issues of 10% as a comparison. The notion of moral that is inherent to health makes it more difficult to trust AI according to Yochanan et al (2018, [25]) and this reflects our findings that AI based decisions are less trusted. It was shown that trusting the medical agent helps trusting his or her decision (Promberger & Baron, 2006, [20]). AI is so far

somewhat limited in its interactions with the patient and cannot provide the same feeling of reinsurance that could increase the patient's trust. Having experienced successful AI in care over time might also help providing this feeling of security and change the patient's opinion according to Wang et al [22]. Perceived uniqueness of the treatment is also a factor fostering trust in the decision according to Longoni et al (2019, [21]). AI being perceived as giving an automated result, doesn't give the reinsuring feeling that the decision is specifically adapted to the individual patient.

Finally, we observe a very high mean of 4.1564 (±1.0237, with 44% of "strongly agree", 30% of "somewhat agree" and 11% neutral) in the question 6 about the importance of legal regulation to control AI in health. It demonstrates that whether the respondents trust, understand and see the ethical issues of AI in health or not, they all agree on the need for legal regulation.

Tendency in age and gender

Now taking a look at these questions through the spectre of the different background variables, we can observe a similar tendency in age and gender. The elderly tends to assess less knowledge of AI together with women. This result on the gender is similar to what was found in the study by Anthony J. Hillesheim et al in 2017[15]. They also both tend to be more concerned by the use of robots in elder care (an exception here for the age 30-39 which is the one rating less scepticism for the issues with AI and elder care) maybe their own parents are not old enough to relate to the issues or maybe another unknown reason should be explored here), to trust less the decision making with or without the approval of a medical doctor, and finally to agree more strongly for legal regulation for AI in health.

Tendency in Household income

Low household incomes follow almost the same tendency over the different questions as women and older ages described above with a few exceptions. Indeed, the lower quartile of income has significantly less self-assessed knowledge about AI then the third quartile on question 1 (p-v = 0,006) and less than the last quartile on question 2 (p-v = 0,0491). The last quartile (1,5M+) scores significantly lower than the first quartile when it comes to considering the ethical risk of the use of robots in elder care (p-v = 0,0249) and scores significantly higher than the 2 first quartiles when it comes to trusting Dr's decisions based on AI (p-v = 0,0021 and p-v = 0,0143). The last quartile of household income scores a higher trust in decisions directly

based on AI than the 3 other quartiles (p-v = 0,001, p-v = 0,005 and p-v = 0,025) showing more confidence in AI. The last question shows differences with groups that did not know or did not want to give their household income. The only thing that we can conclude from this is that despites the differences for uninterpretable groups, all the sub-groups were scoring high to this question, agreeing on the need for legal regulation. There was no relevant study in the literature to compare my results.

The variable of education

Now analysing the variables of education did not bring such a clear tendency as for the other variables. The median group (post-secondary education from 1 to 3 years) has self-assessed a higher knowledge than the groups with primary education (p-v = 0,0291), secondary education (p-v = 0,001) and the group of post-secondary 4 to 5 years (p-v = 0,0276). Then, the group of secondary educated respondents has scored lower than the post-secondary 5 years and more for the 2nd question, higher than the post-secondary 3 to 4 years at the question 3, and lower than the post-secondary 5 years and more at the 4th question. Gathering these results, we can see that the secondary educated groups stands out for the 4 first questions, following the previously exposed tendency to be less knowledgeable and more sceptical towards AI in health both in direct care with robots and decision making. In a study from Hillesheim et al [15], the higher educational level was related to higher trust in an "Autonomous agent". Without any significant difference between the groups of education at the two last questions, it's difficult to interpret the role of this variable on the 2 last questions.

Accounting for the self-assessed knowledge of AI

Let us now focus on the two most important and most interpretable findings of this section.
First, we can observe that the respondents have generally chosen the same answer to the second question about understanding the implementation of AI health and to the first question about general knowledge about AI. This demonstrates that the respondent shave been consistent in their answers; indeed, if they know nothing about AI how could they understanding its implementation in healthcare. Secondly, the Tuckey test on question 5 shows that the respondents who have self-assessed a low understanding of AI are also the ones who would trust the least decision making in health directly based on AI without human reviewing. The opposite is also verified, the more the respondents know about AI the less sceptical they are when it comes to let AI make decisions. The fact that AI can be seen as a black-box (in which

one does not understand how the decisions are made) from the less knowledgeable point of view can contribute to a lower trust in AI [18, 22]. Transparency and explicability of the models would reinsure the patients according to Wang et al [22]. However, it does not forcedly mean that training the less knowledgeable would lower this scepticism. Self-assessed knowledge is very subjective and can be over-evaluated. It's also possible that the more knowledgeable could change their mind if they knew even more. Still, it is an interesting finding that calls for more research about to the mechanism behind the correlation. It's also important to stress that knowledge had no impact on the call for legal regulation, all the knowledge groups agreed on this question. This demonstrates a shared preference for a secured and controlled AI. It also shows that being aware of the ethical challenges brought by AI and trusting decision making based on AI does not affect the general desire for legal regulation.

Limitations

The representativeness of the sample is directly affected by the selection of the panel by Norstat. The responsiveness to the survey will condition the representativeness too. Those who are more interested in the subject may be more likely to answer the questionnaire, skewing the sample even though Norstat has selected the respondents along the course of the survey to obtain a representative sample.
People who are not confidents with electronic devices and internet might be underrepresented in the study despite the fact that 97% of the household of Norway are connected to internet.

The participant's answers are just self-reported evaluations and opinions, it must not be considered as evidences measured with objective standards. It's also not possible to verify that the participants have filled the form conscientiously. However, according to Hargittai et al (2009, [26]), the respondents are generally answering the surveys conscientiously and they do not tend to make up their answers.

The personality of the respondents such as low self-confidence can affect the self-assess knowledge, understanding and awareness of the respondents according to Mondak et al [27]. The perception of the scale of answer can also differ between the different categories of respondent and skew the overall result.

The questions of our survey were very general and the content could be interpreted in various ways depending on the respondent's experience and knowledge.

In this study, the notions of understanding and trust are used in a very broad way. A more nuanced comparison would require a more stringent study of these terms.

11. Conclusion

The overall tendency is to self-assess a high knowledge of AI when being a man, having a household income over 1 million NOK and aged under 39 years-old as opposed to over 40 years-old, female and less than 1 million NOK household income. The respondents who assess a lower knowledge of AI are also the ones who trust less AI decision making whether it is reviewed by a doctor or not and are more aware of the ethical issues in the use of robots in elder's care. Trust is generally higher when AI decisions are reviewed by a medical doctor. All the categories generally agreed on the need of a legal regulation of AI.

This study is only an explorative study. More information is needed to conclude that women, elderly and individuals with a lower household income actually would benefit more from an education in AI. Moreover, we do not know whether it's the knowledge of the respondent that explain the attitudes towards AI (scepticism, trust) and if therefore, educating the respondent would change this attitude. We also can't tell if the respondents who would trust more AI's decision making are unaware of the possible ethical issues of AI or if they just basically find it ethically acceptable. More research, and preferably qualitative research that allows researchers to probe deeper into the actual level of knowledge of AI as well as accounts for reservations towards AI technologies, is needed.

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12. Appendix

Kunstig intelligens (KI) er teknologi som enten er i stand til å etterligne menneskelig atferd eller fremvise en mer effektiv evne til å resonnere og løse problemer. KI kan hjelpe mennesker til å ta beslutninger ved å behandle omfattede data eller peke ut handlingsalternativer. KI kan også ta avgjørelser på egenhånd. Eksempler på KI teknologi inkluderer ansiktsgjenkjenning, selvkjørende biler og bildediagnostikk.

I hvilken grad er du enig i følgende påstander?

	Jeg er veldig uenig	Jeg er litt uenig	Jeg er ikke enig eller uenig	Jeg er litt enig	Jeg er veldig enig	Jeg vet ikke
Jeg vet hva kunstig intelligens teknologi dreier seg om.						
Jeg vet om ulike måter kunstig intelligens kan brukes for å forbedre helsetjenesten.						
Jeg forstår hvordan bruk av kunstig intelligens i helsetjenesten kan skape etiske utfordringer						
Jeg stoler på at myndigheten vil forhindre uakseptabel bruk av kunstig intelligens i helsefeltet.						
Jeg stoler på at forskere ikke vil utvikle etisk uakseptable løsninger basert på kunstig intelligens i helsefeltet.						
Jeg synes vi som borgere bør få være med å bestemme hva som er akseptabel bruk av kunstig intelligens i helsefeltet.						

1 - Survey in Norwegian1

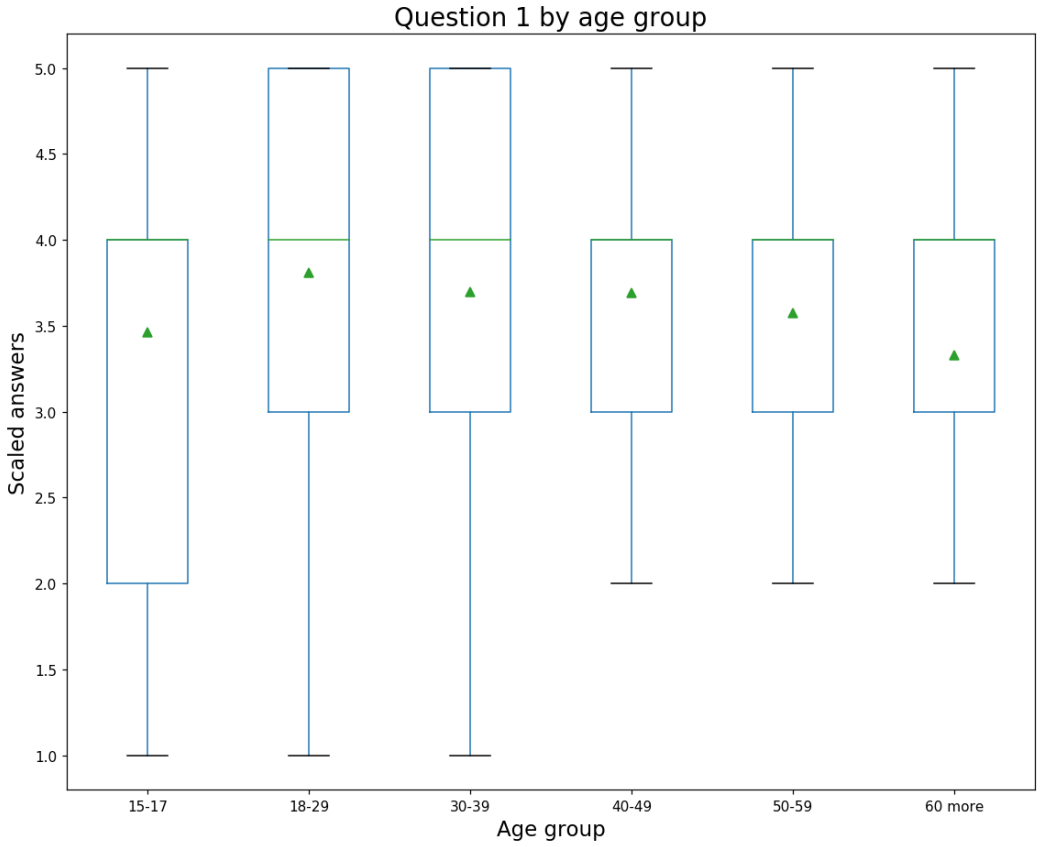
Artificial intelligence (AI) is a technology that is capable of mimicking human behaviour and demonstrating a more efficient ability to reason and solve problems. AI can help people make decisions by processing comprehensive data or pointing out action options. Ai can also make decisions on its own. Examples of AI technologies include face recognition, self-driving cars and imaging.

To what extend do you agree with the following statements?

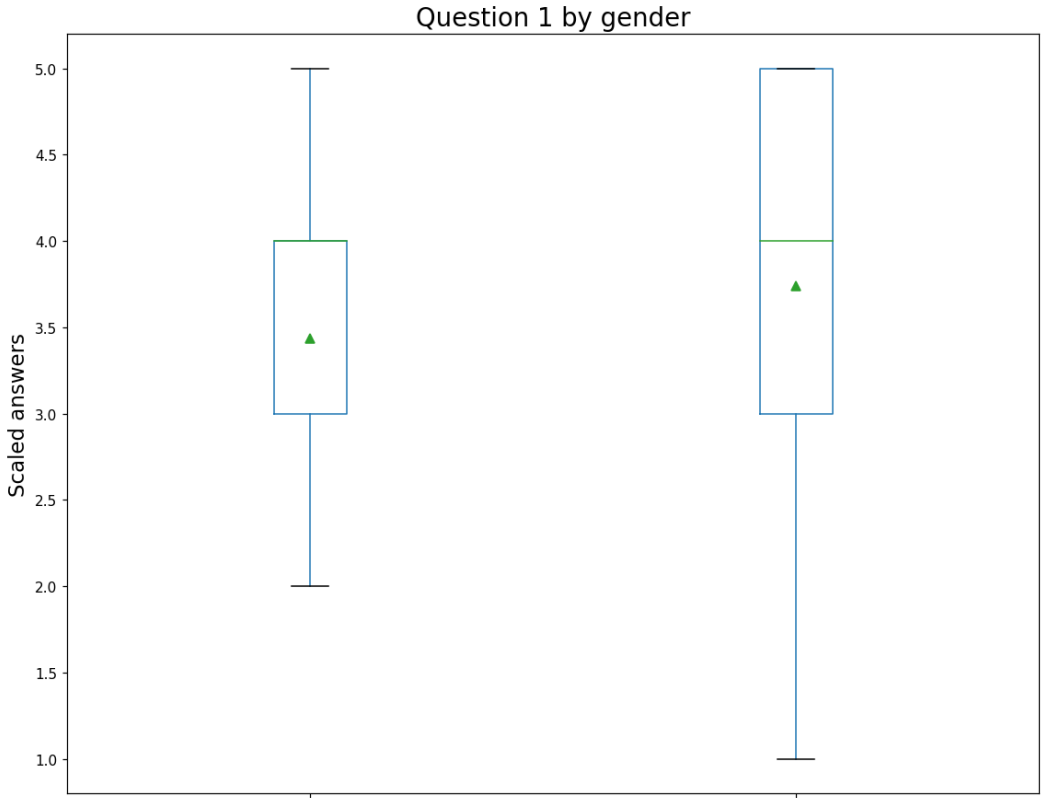
	I strongly agree	I somewhat agree	Neither agree nor disagree	I somewhat agree	I strongly agree	I don't know
I understand what the AI technology is about						
I understand how AI can contribute to an efficient healthcare service						
I think that the use of AI-based robots with elders can create ethical challenges						
I believe that medical doctor's decisions based on AI contribute to a good treatment						
I believe that decisions directly based on AI contribute to a good treatment						
I think we should have laws regulating the use of AI in the healthcare system						

2 - Survey in English

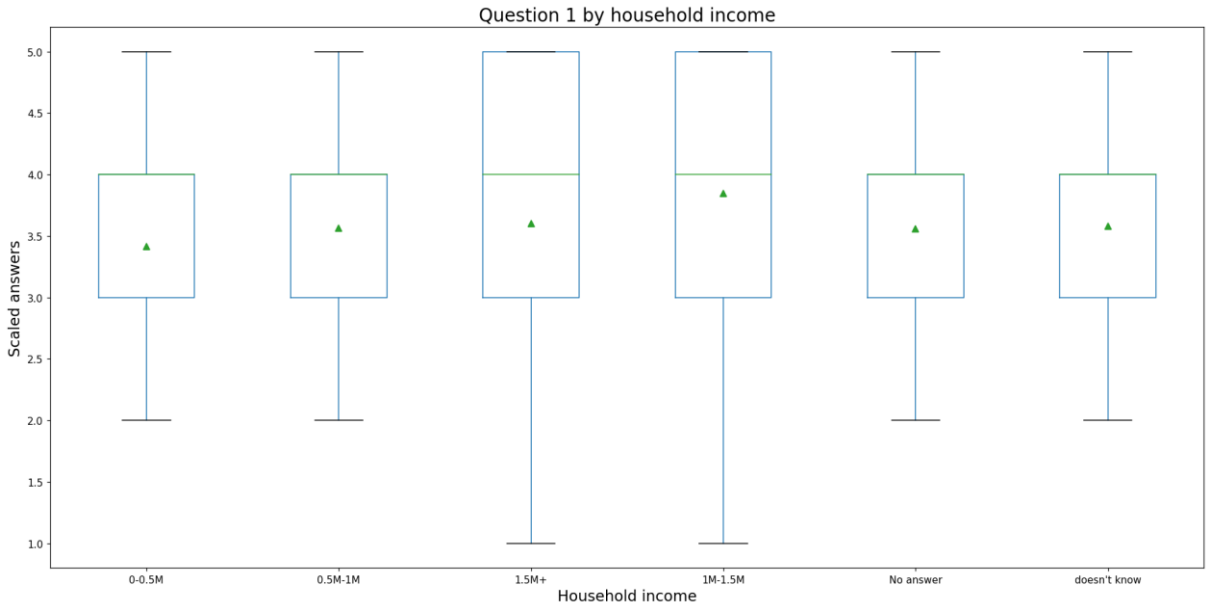
Question 1



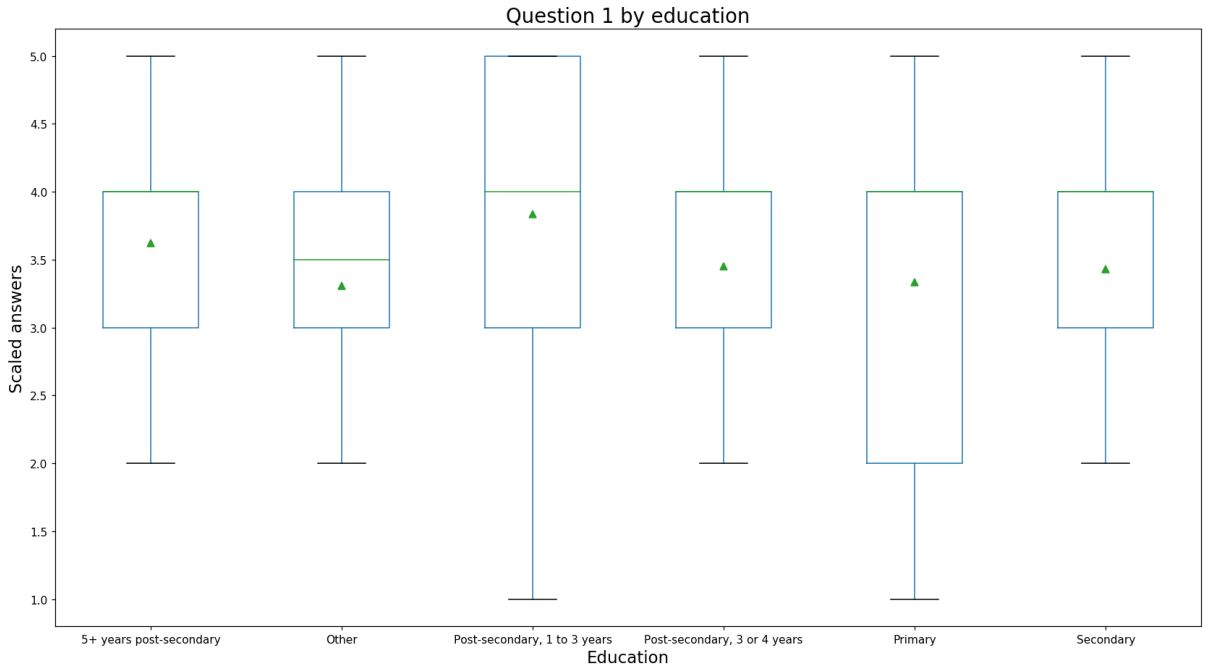
3 - Question 1 : Boxplot Age



4 - Question 1 : Boxplot Gender

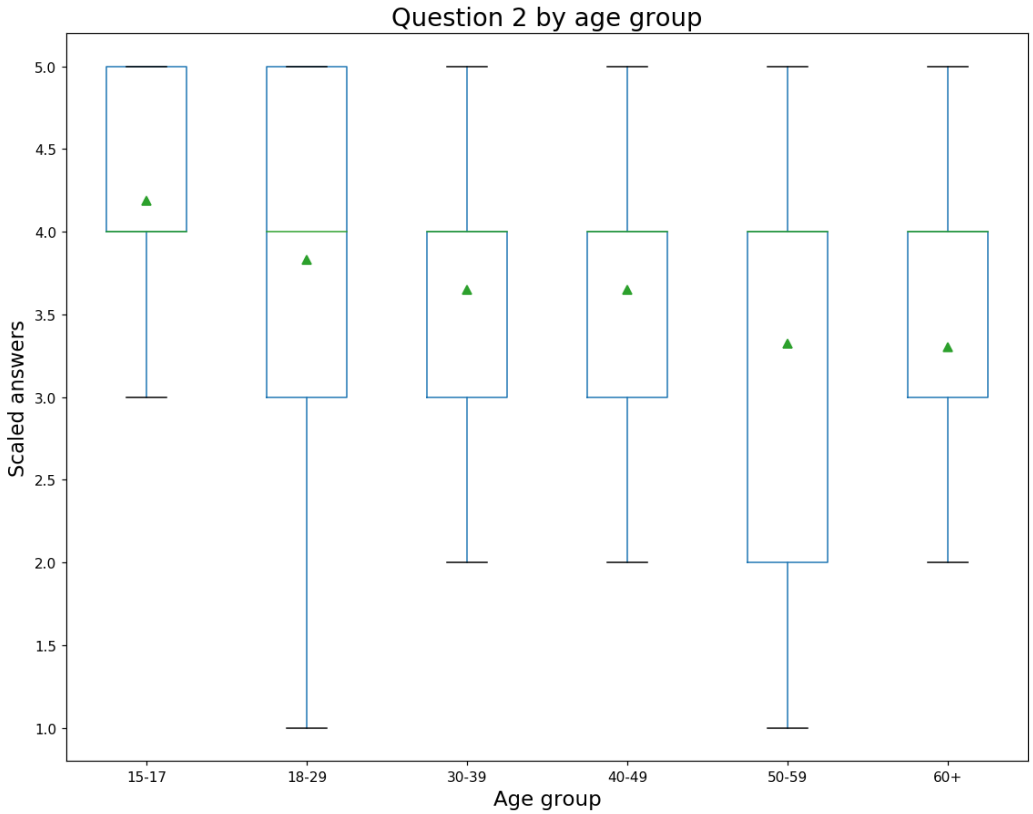


5 - Question 1 : Boxplot Household income

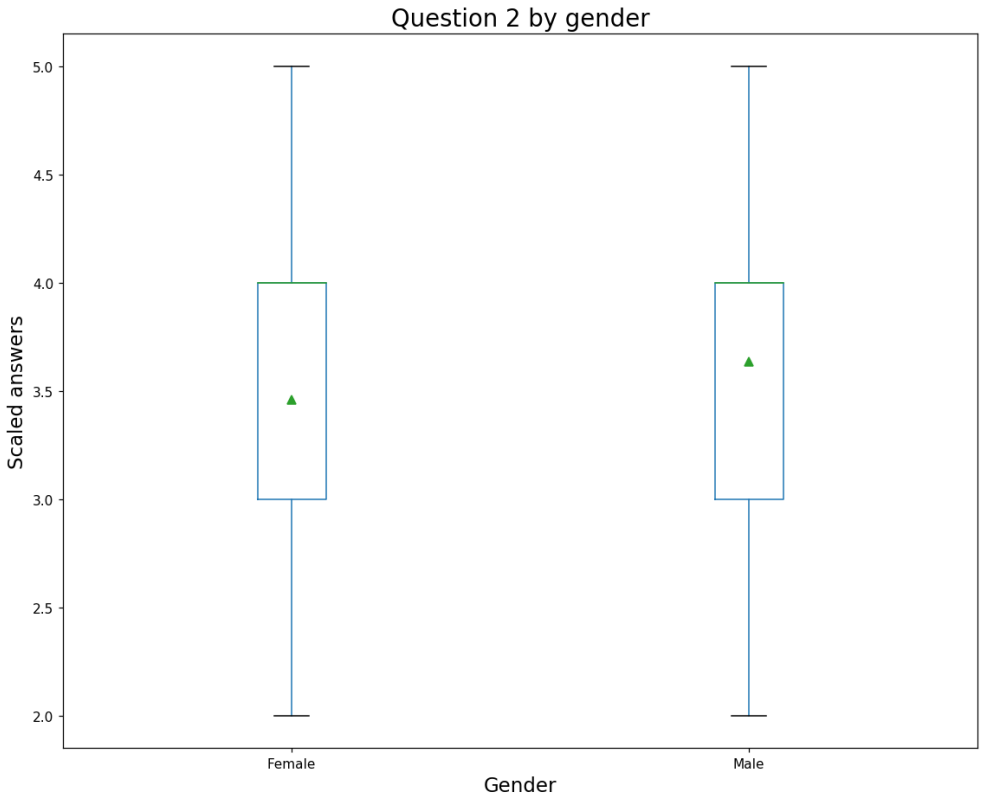


6 - Question 1 : Boxplot Education

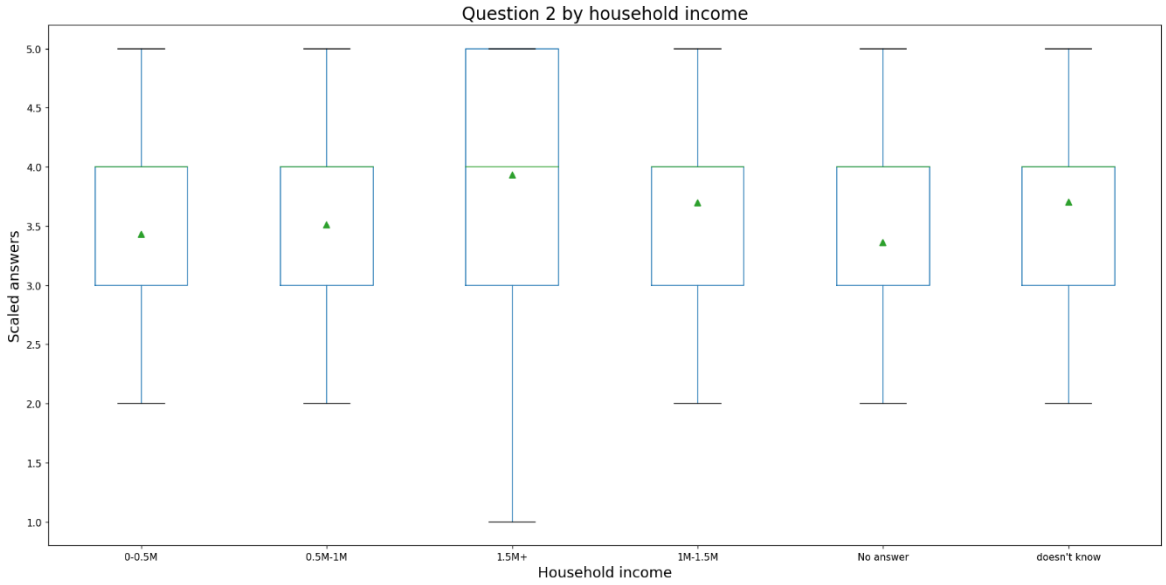
Question 2



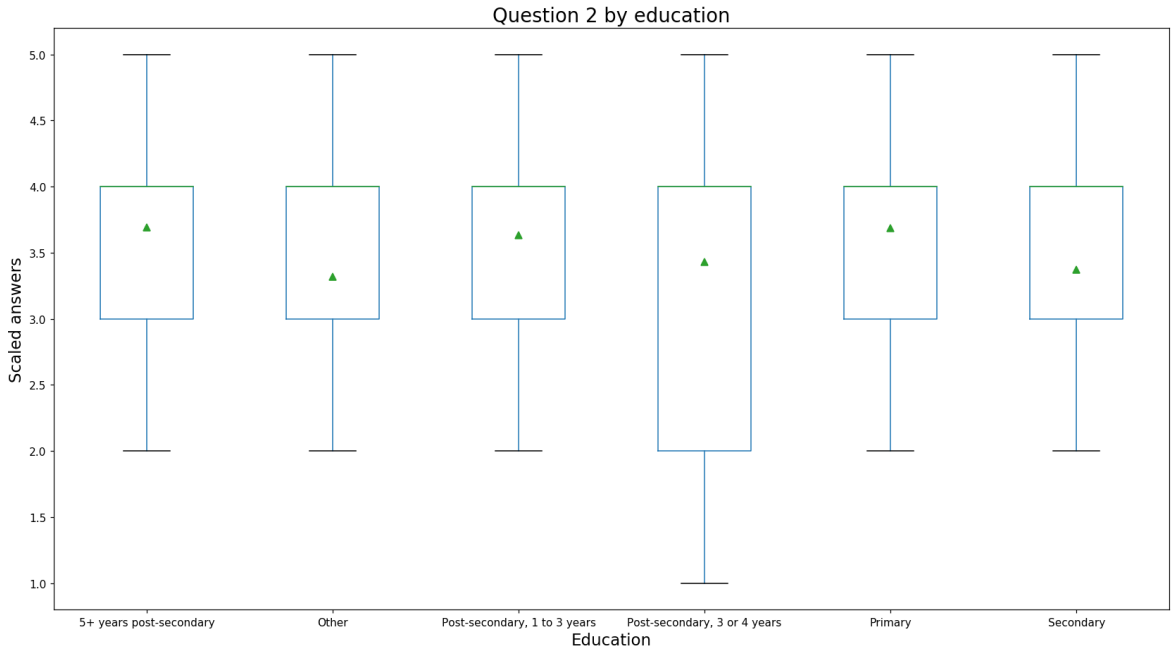
7 - Question 2 : Boxplot age



8 - Question 2 : Boxplot gender

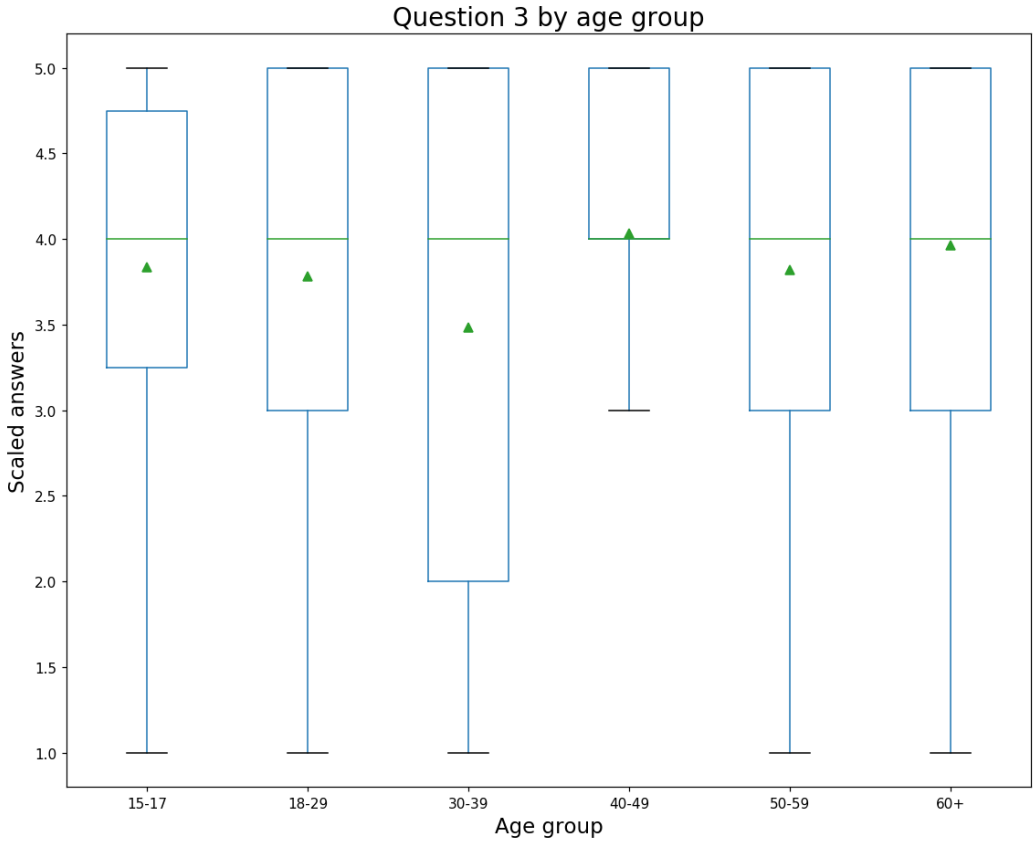


9 - Question 2 : Household income

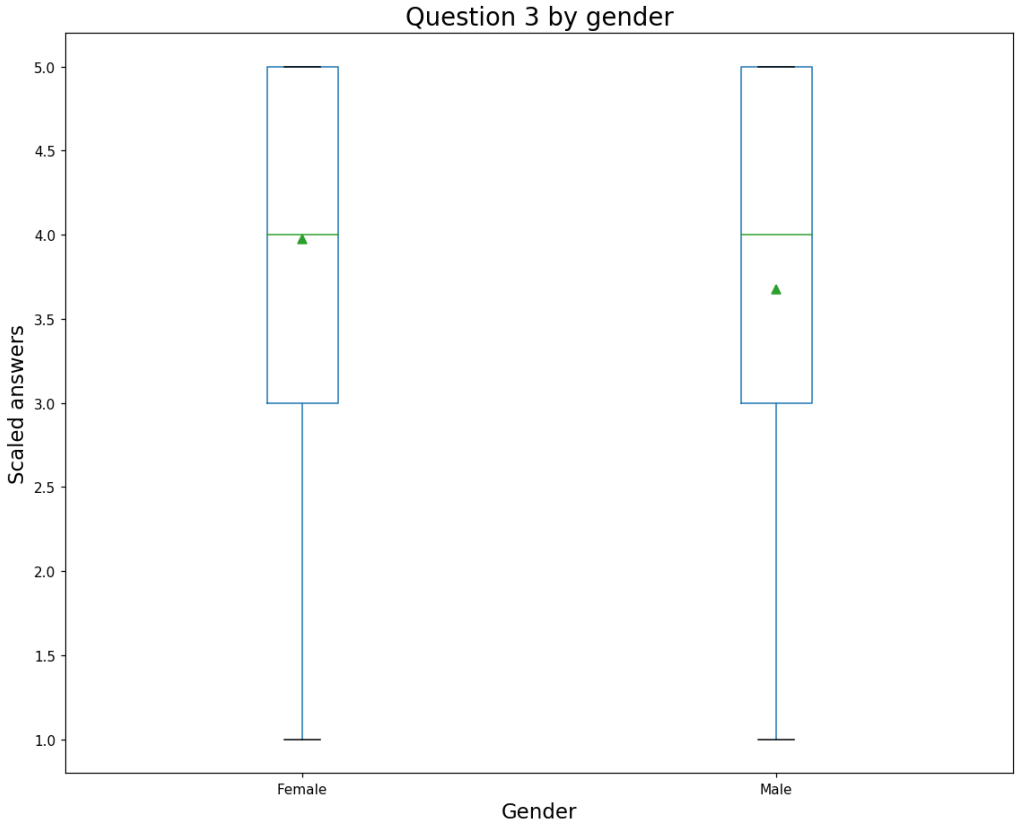


10 - Question 2 : Boxplot Education

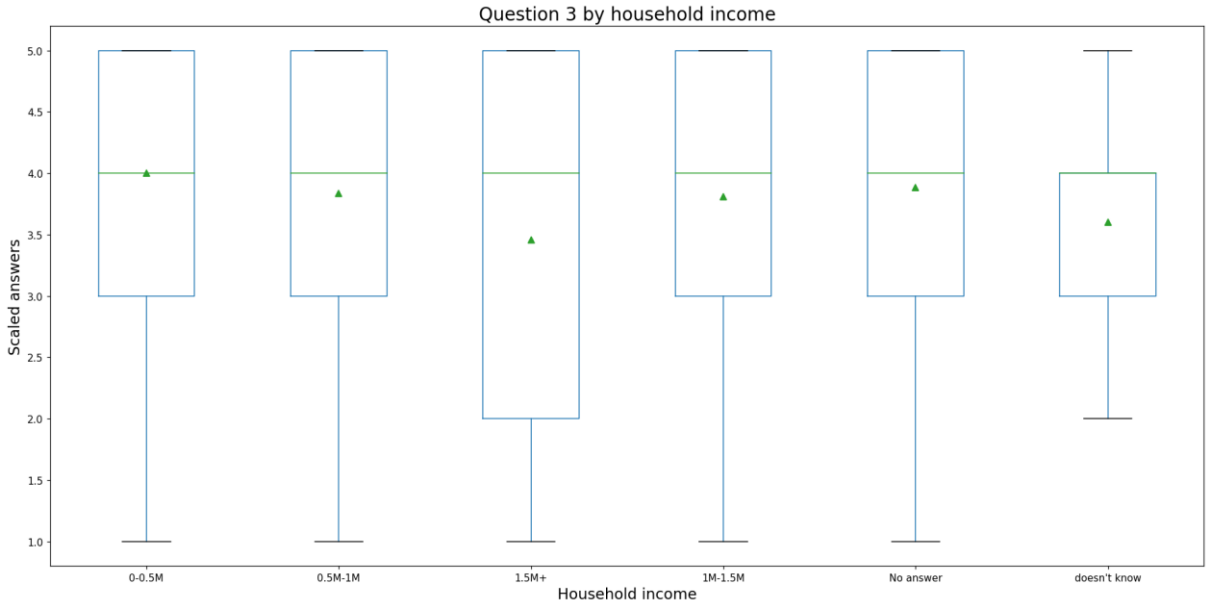
Question 3



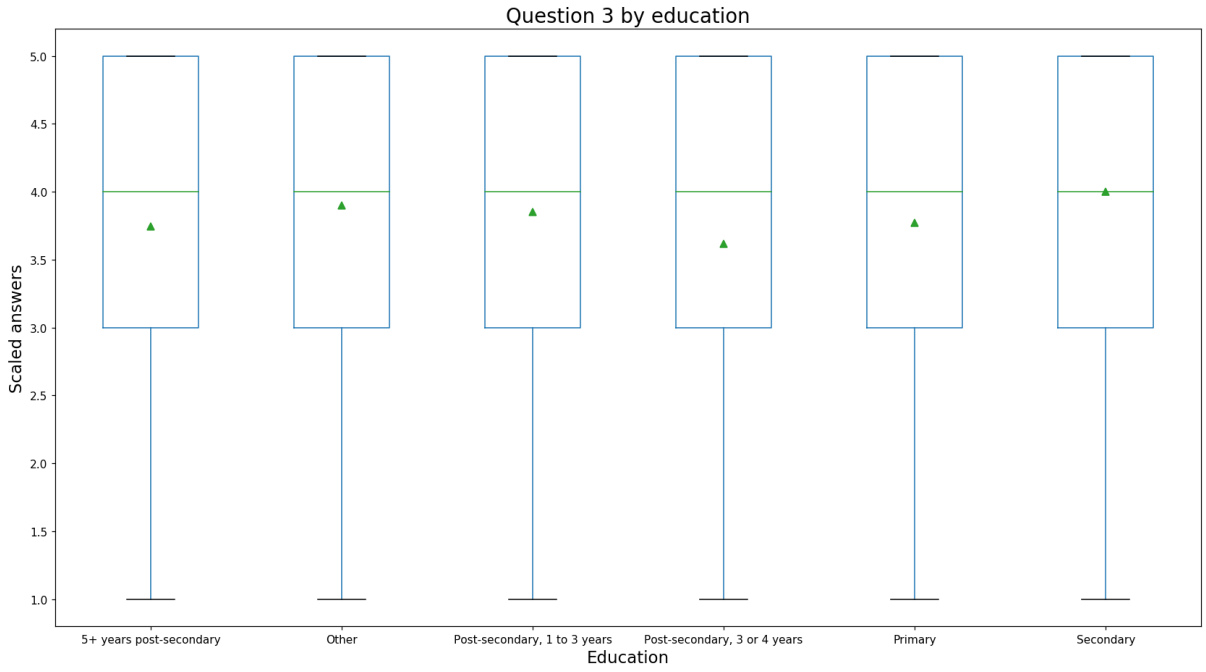
11 - Question 3: Boxplot of age



12 - Question 3: Boxplot of gender

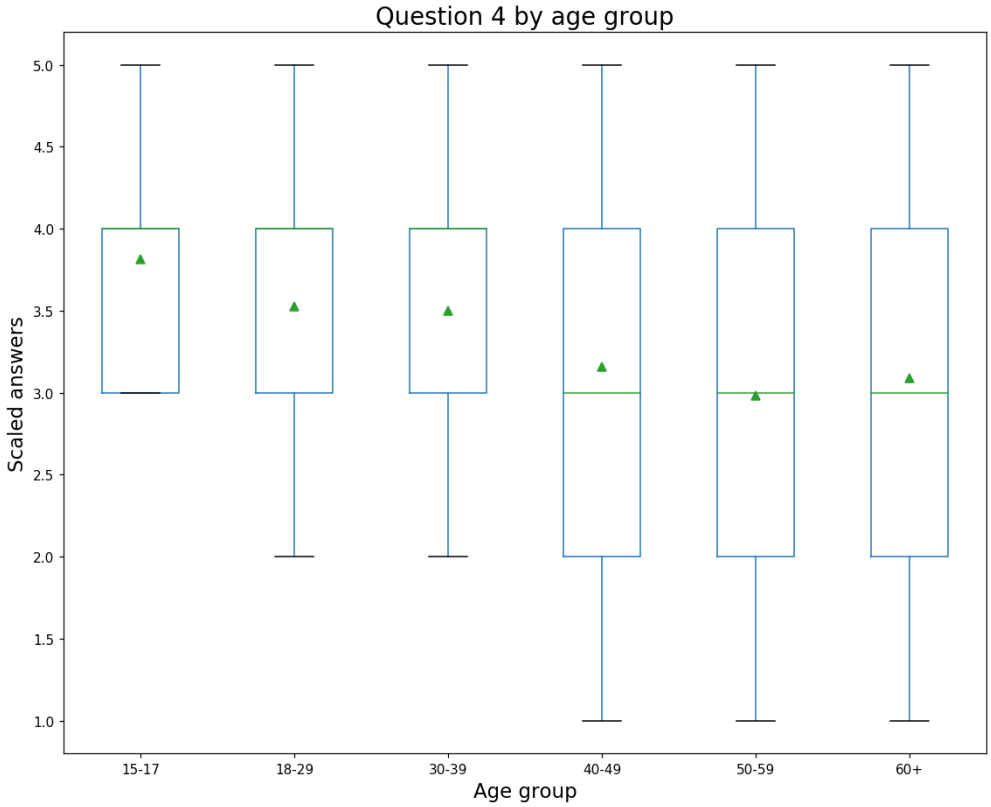


13 - Question 3: Boxplot of Household income

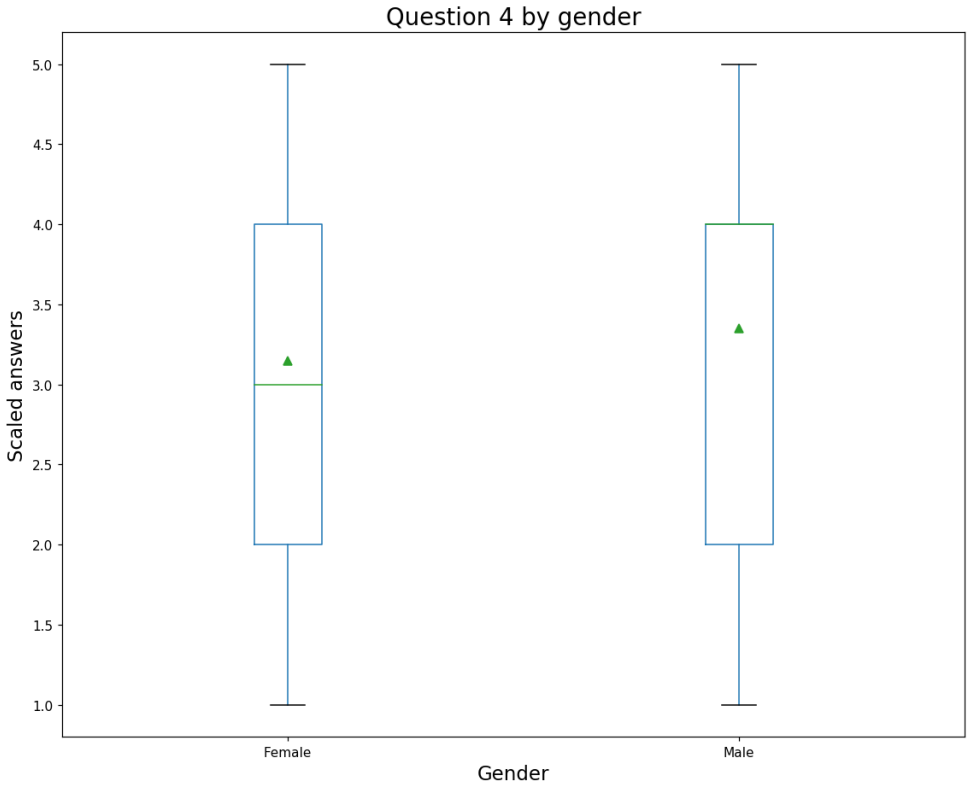


14 - Question 3: Boxplot of education

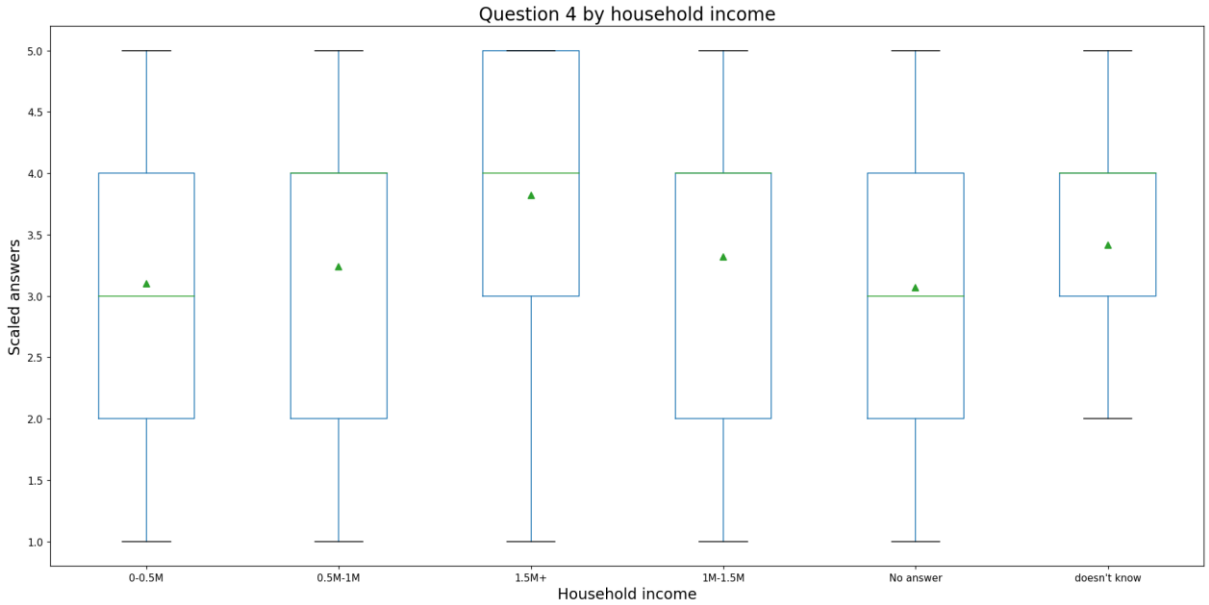
Question 4



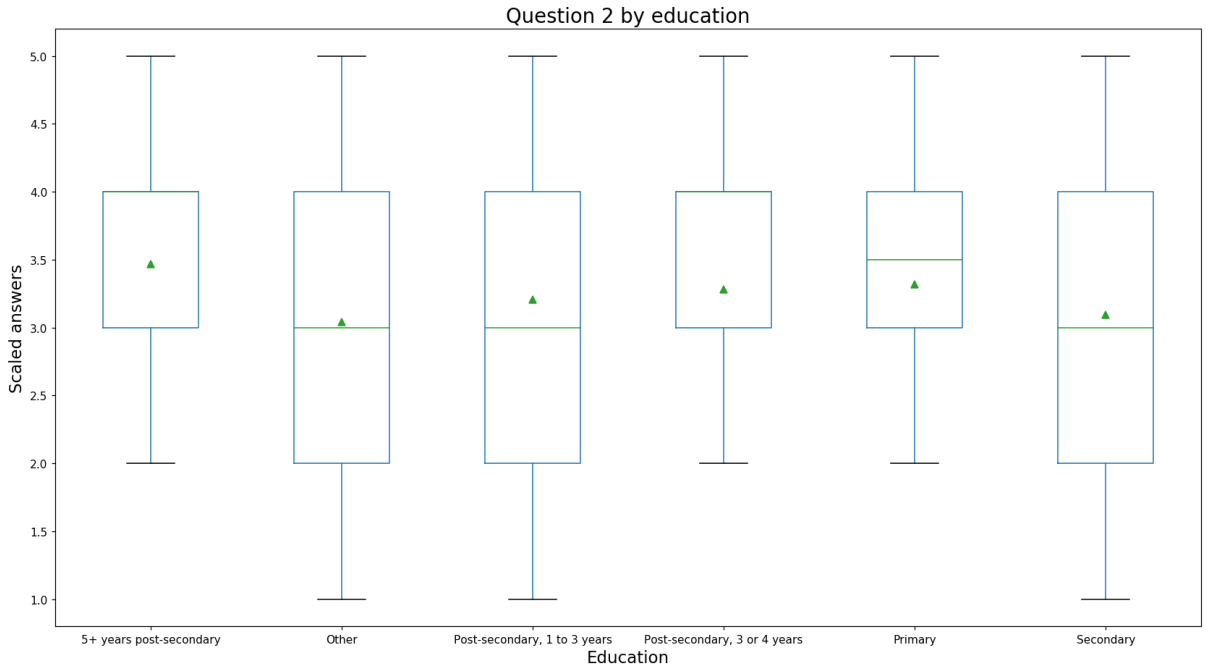
15 - Question 4: Boxplot of age



16 - Question 4: Boxplot of gender

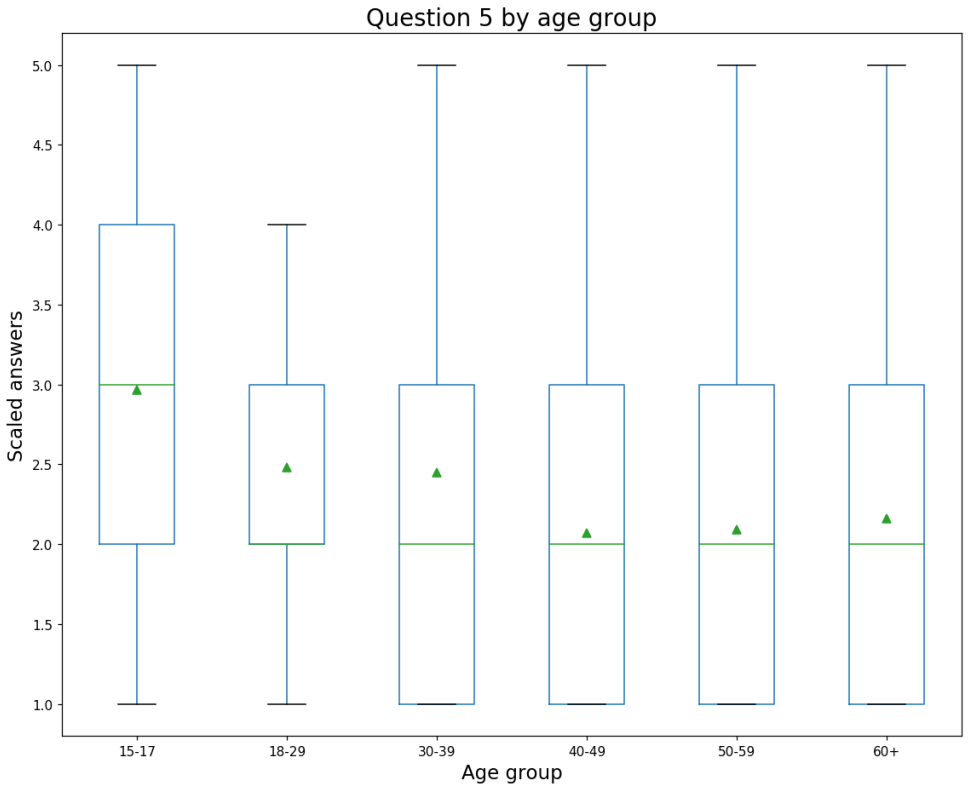


17 - Question 4: Boxplot of Household income

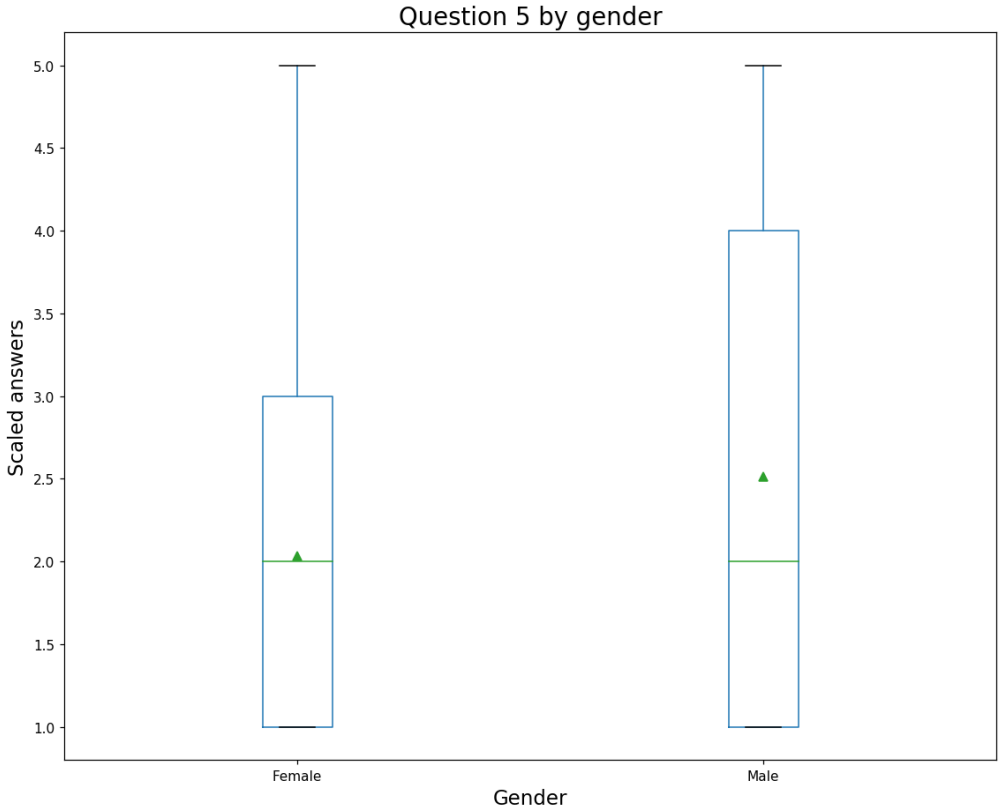


18 - Question 4: Boxplot of education

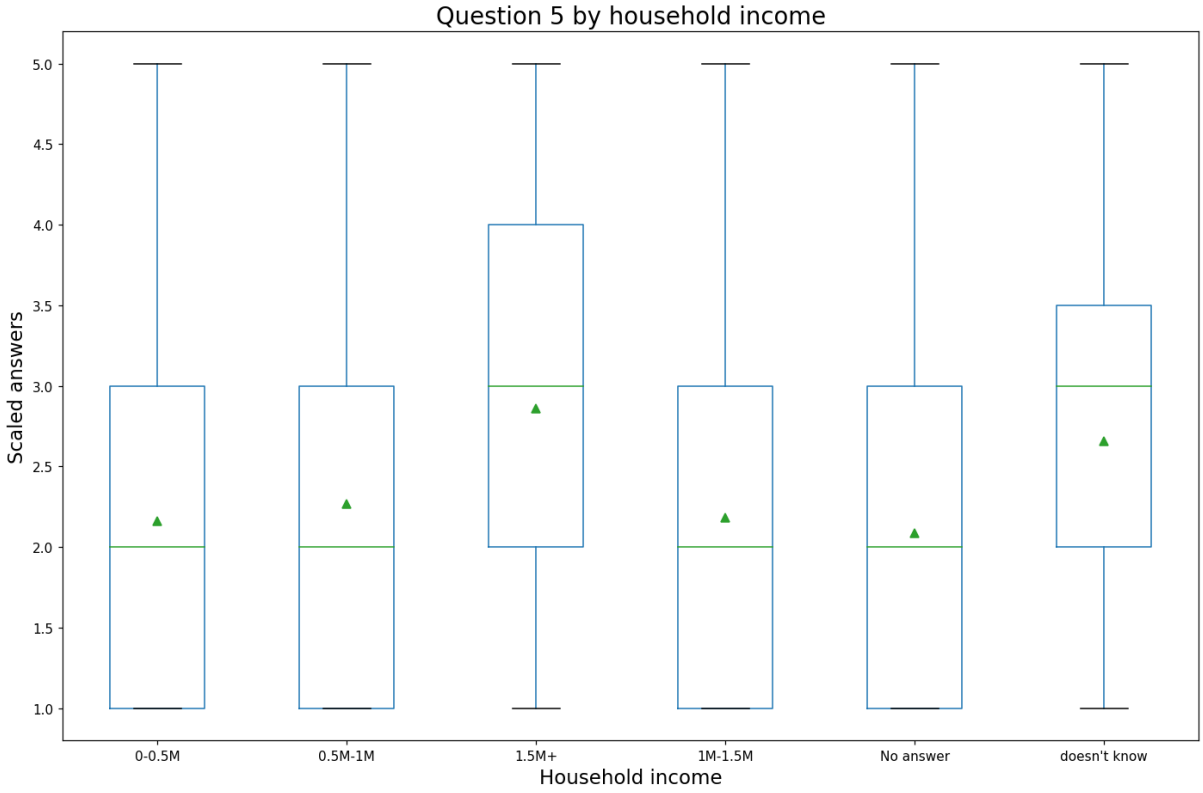
Question 5



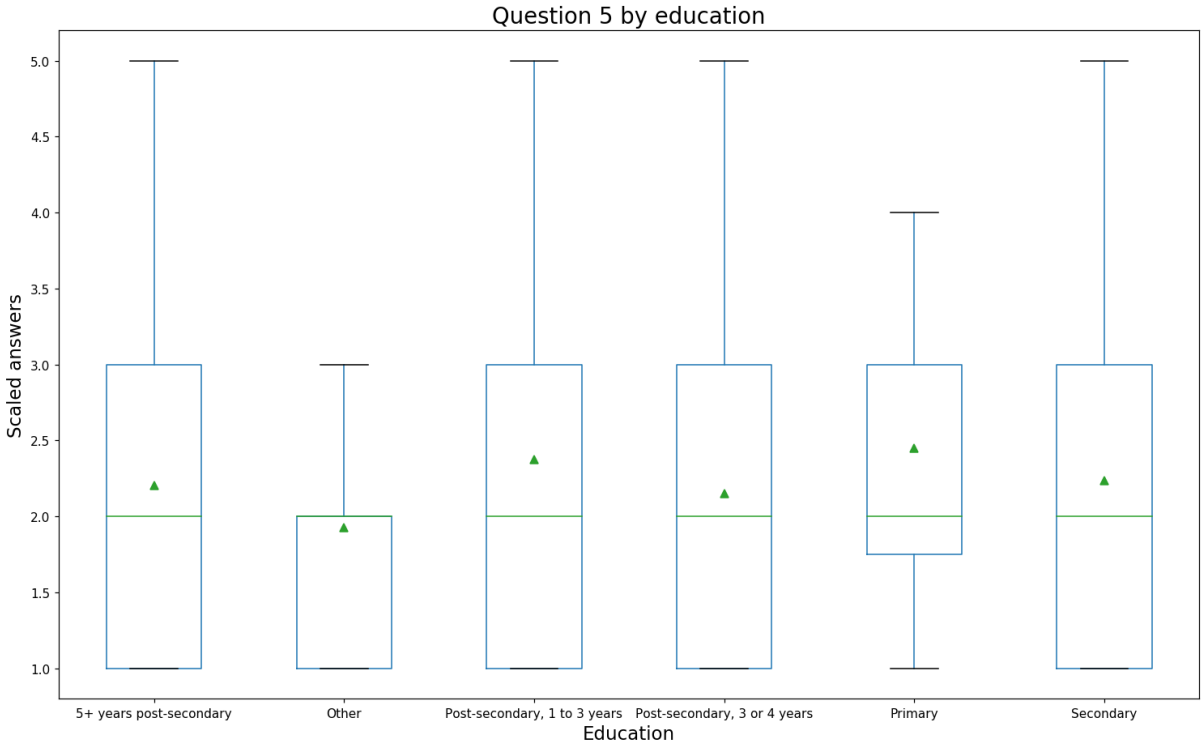
19 - Question 5: Boxplot of age



20 - Question 5: Boxplot of gender

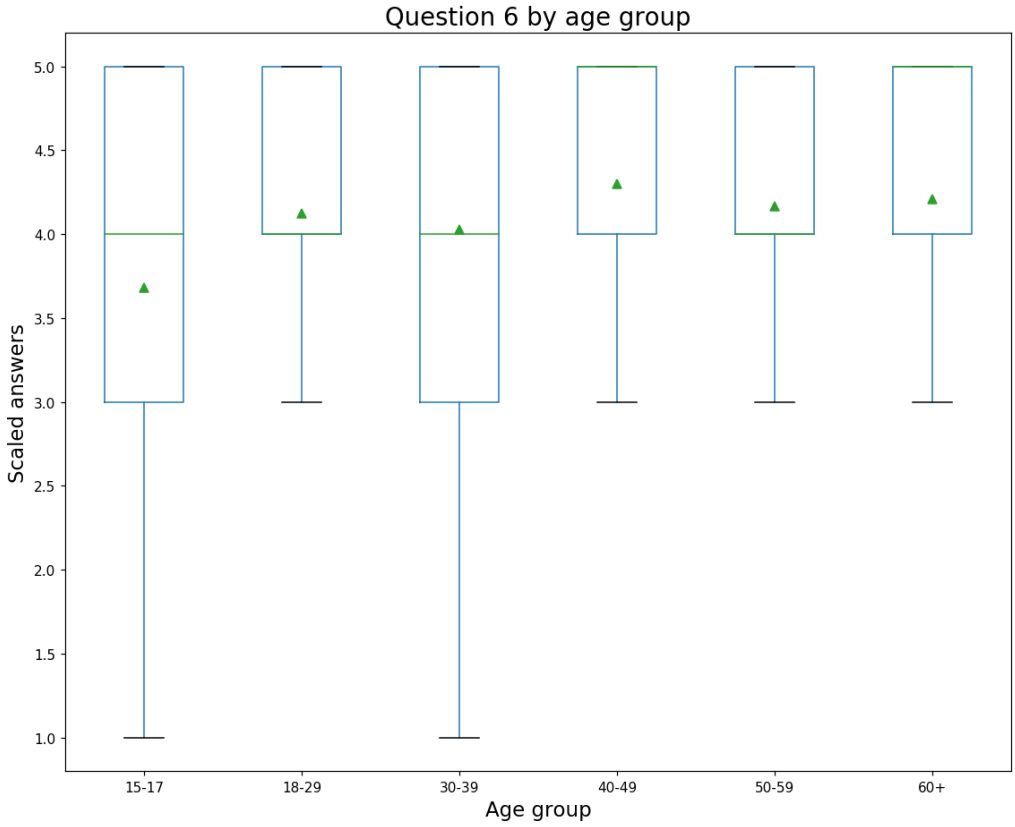


21 - Question 5: Boxplot of Household income

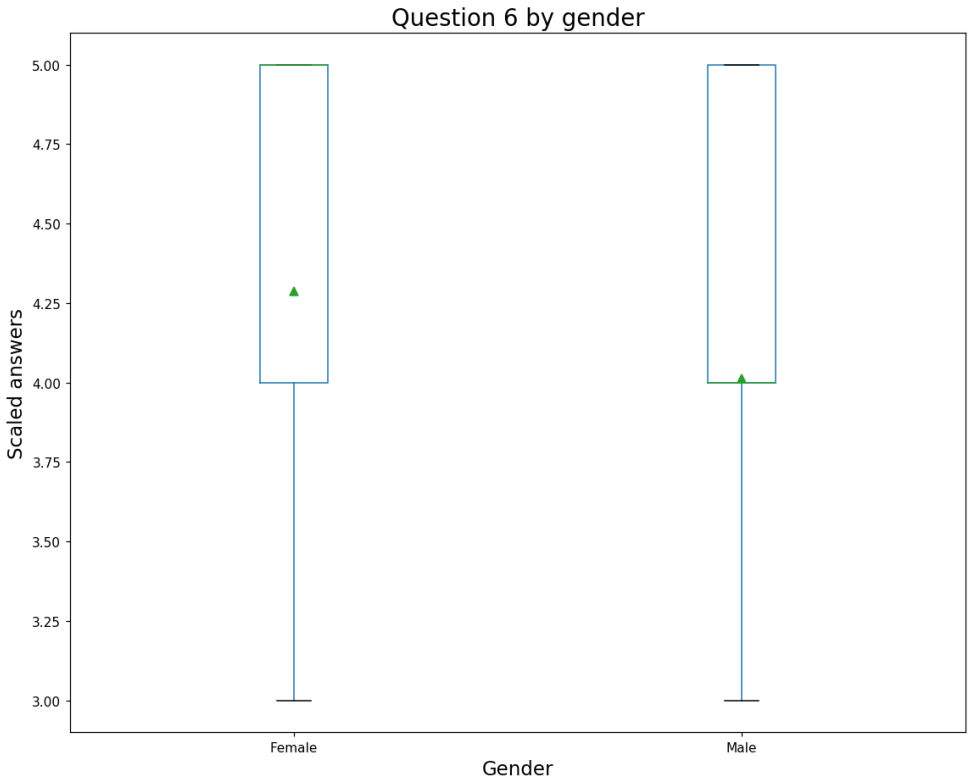


22 - Question 5: Boxplot of education

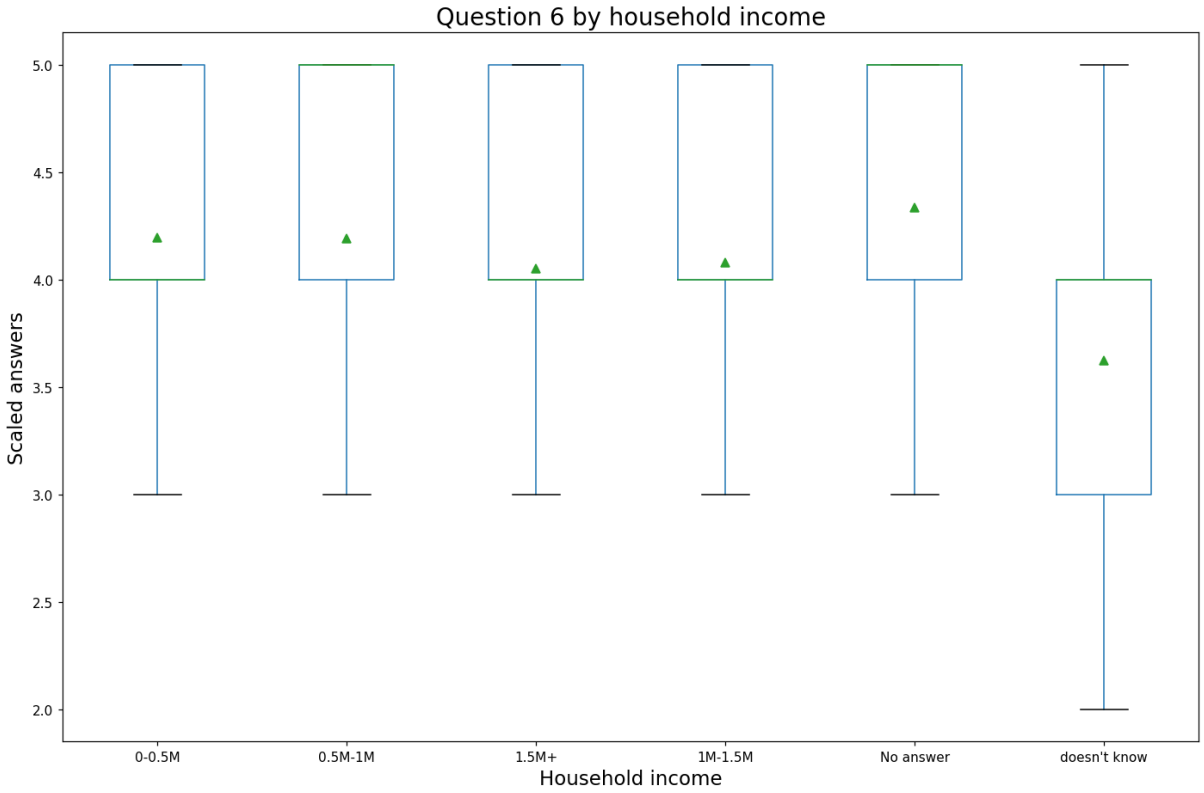
Question 6



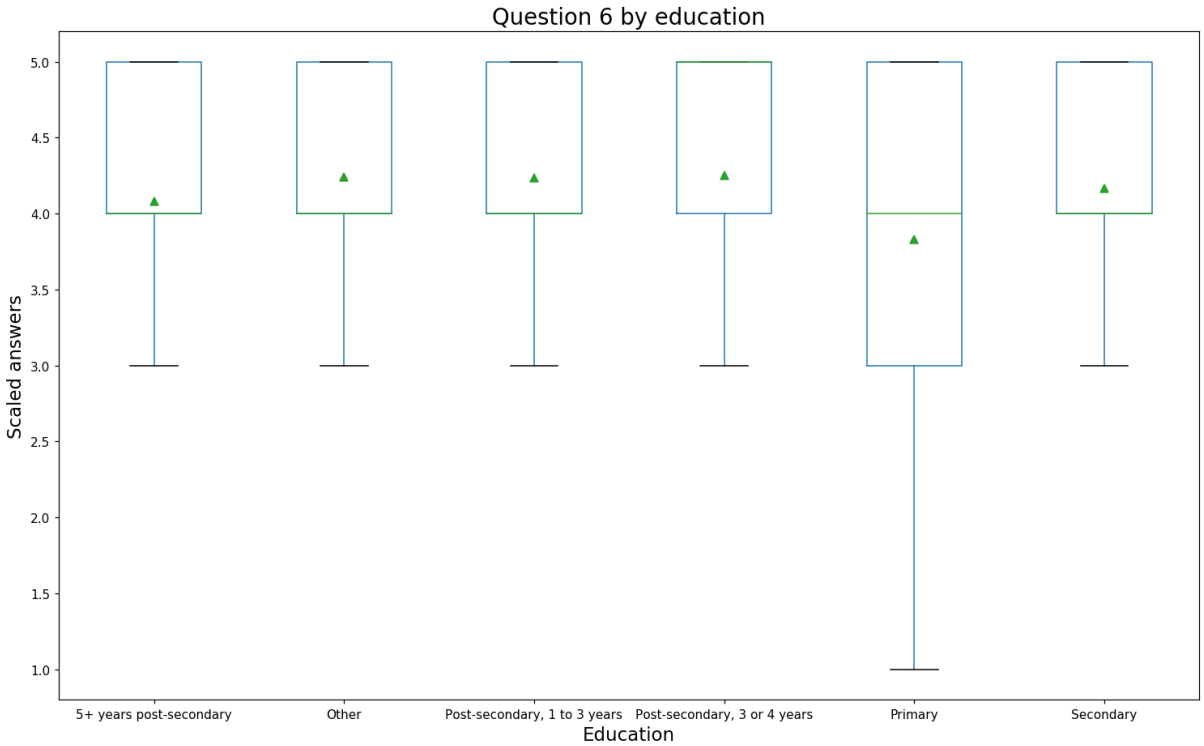
23 - Question 6: Boxplot of age



24 - Question 6: Boxplot of gender

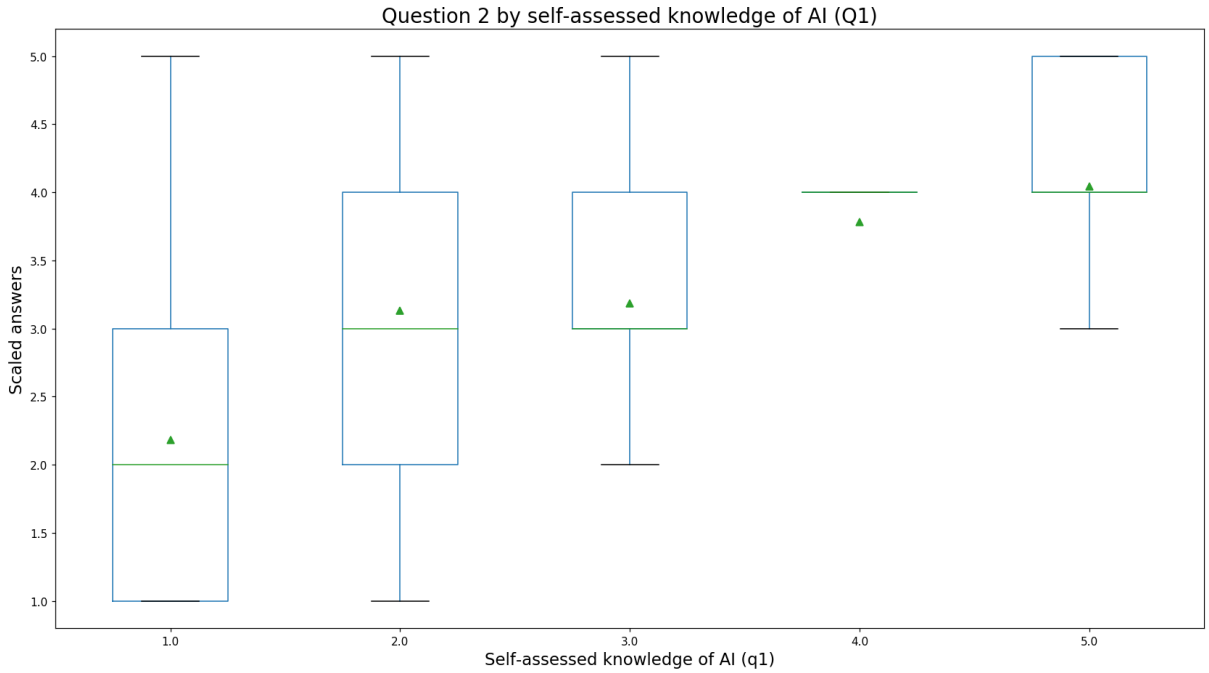


25 - Question 6: Boxplot of Household income

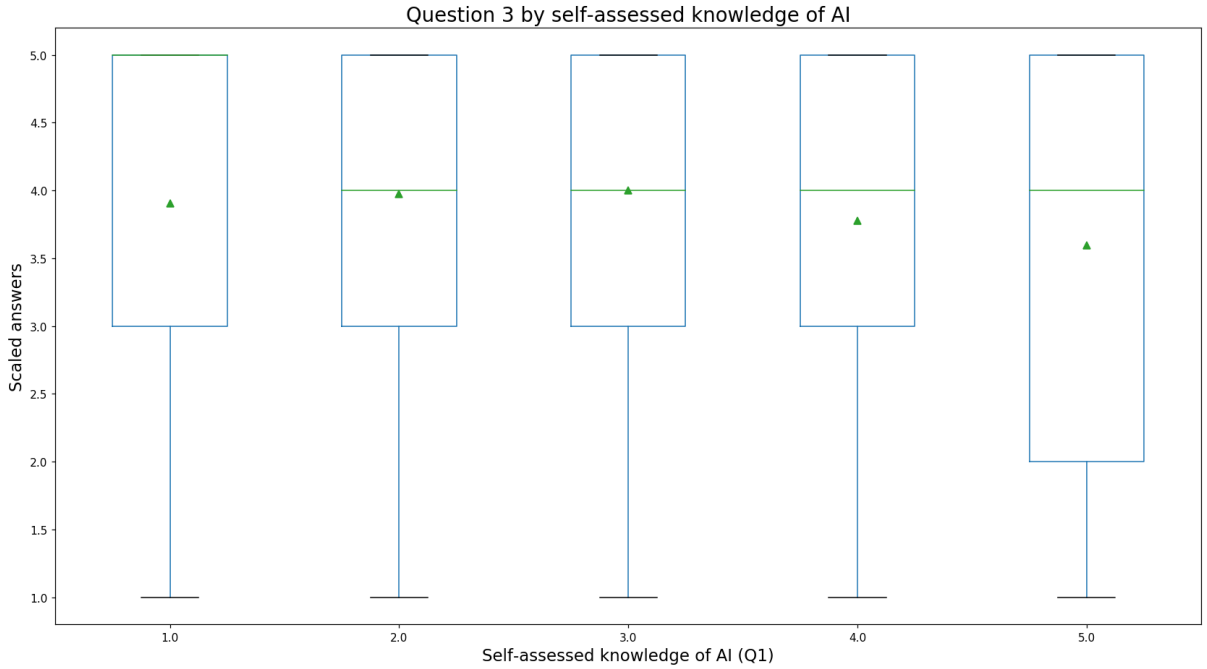


26 - Question 6: Boxplot of education

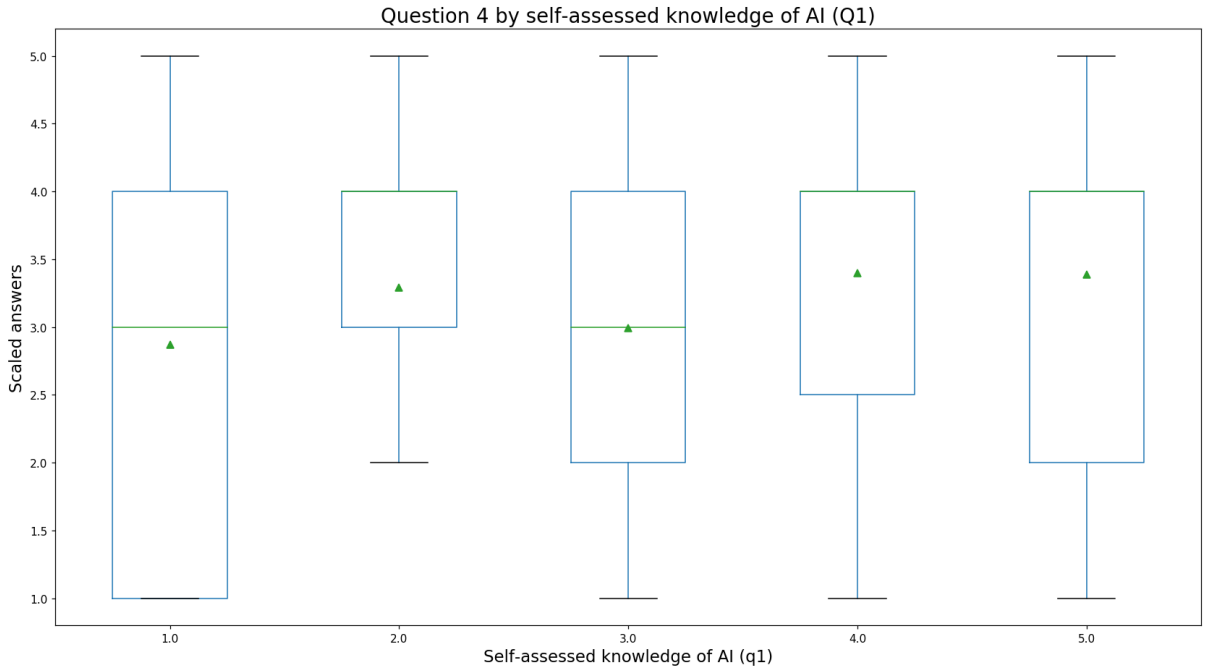
Comparisons to question 1



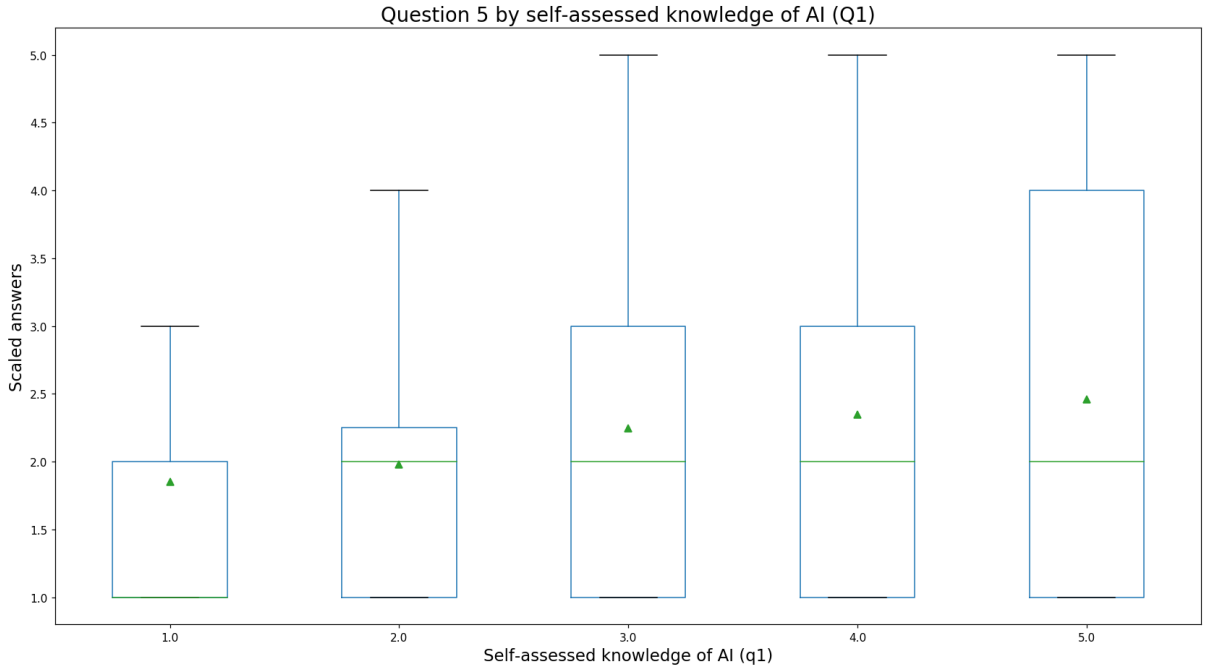
27 - Answers to Q2 grouped by answers to Q1



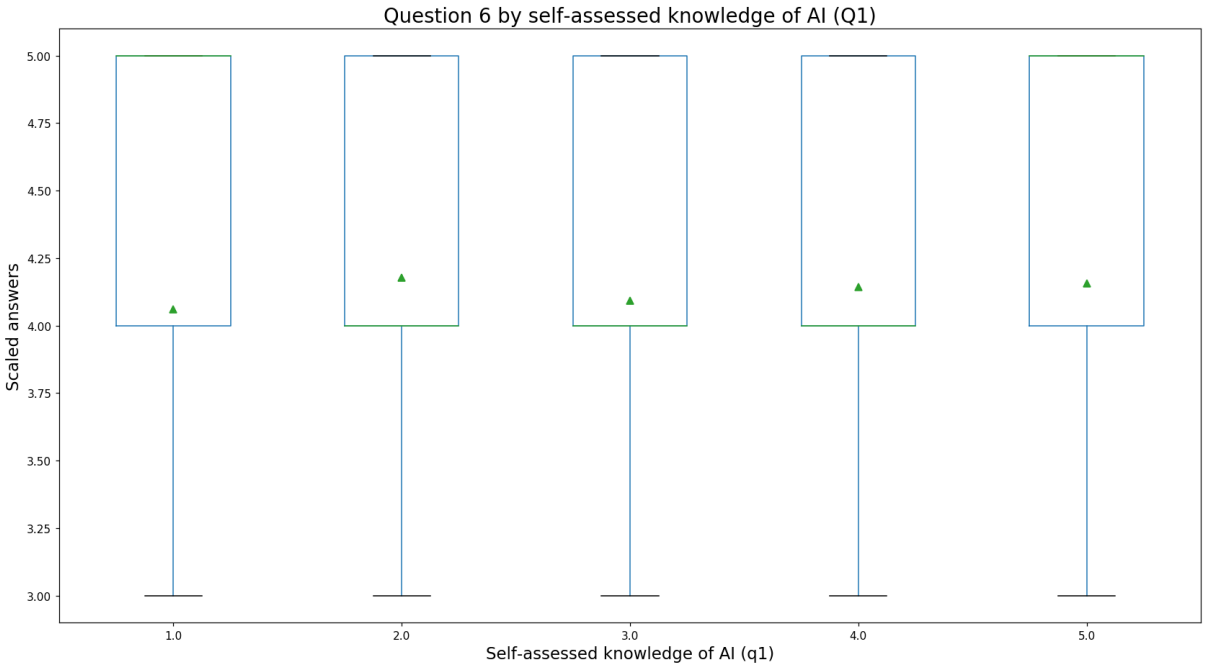
28 - Answers to Q3 grouped by answers to Q1



29 - Answers to Q4 grouped by answers to Q1



30 - Answers to Q5 grouped by answers to Q1



31 - Answers to Q6 grouped by answers to Q1

Results of the Tuckey (HSD) tests

Tuckey HSD (α= 0.05)	*Comparison*		*meandiff*	***p-adj***	*lower*	*upper*	*reject*
Question 1 (I understand what the AI technology is about)							
Age	*18-29*	*60 more*	-0.4808	**0.001**	-0.7977	-0.164	True
	30-39	*60 more*	-0.3691	**0.0208**	-0.7037	-0.0345	True
	40-49	*60 more*	-0.3618	**0.0238**	-0.6942	-0.0294	True
Household income	*0-0.5M*	*1M-1.5M*	0.4301	**0.006**	0.0812	0.7791	True
Education	*Post-sec, 1 to 3 years*	*Post-sec, 3 or 4 years*	-0.3841	**0.0276**	-0.7425	-0.0256	True
	Post-sec, 1 to 3 years	*Primary*	-0.5045	**0.0291**	-0.9781	-0.0309	True
	Post-sec, 1 to 3 years	*Secondary*	-0.4057	**0.001**	-0.6948	-0.1166	True
Question 2 (I understand how AI can participate to an efficient healthcare service)							
Age	*15-17*	*50-59*	-0.8624	**0.0044**	-1.5453	-0.1795	True
	15-17	*60+*	-0.8844	**0.0021**	-1.548	-0.2208	True
	18-29	*50-59*	-0.5058	**0.001**	-0.8657	-0.1459	True
	18-29	*60+*	-0.5278	**0.001**	-0.8494	-0.2061	True
	30-39	*60+*	-0.3475	**0.0427**	-0.6883	-0.0066	True
	40-49	*60+*	-0.3471	**0.0456**	-0.6902	-0.004	True
Household income	*0-0.5M*	*1.5M+*	0.5002	**0.0491**	0.0012	0.9992	True
Education	*5+ years post-sec*	*Secondary*	-0.3188	**0.0424**	-0.6312	-0.0064	True
Question 3 (I think that the use of AI-based robots in the care of elderly creates ethical challenges)							
Age	*30-39*	*40-49*	0.5501	**0.001**	0.1568	0.9434	True
	30-39	*60+*	0.4803	**0.0011**	0.1342	0.8264	True
Household income	*0-0.5M*	*1.5M+*	-0.541	**0.0249**	-1.0406	-0.0414	True
Education	*Post-sec, 3 or 4 years*	*Secondary*	0.3846	**0.045**	0.005	0.7643	True
Question 4 (I believe that medical doctor's decisions based on AI contribute to a good treatment)							
Age	*15-17*	*50-59*	-0.833	**0.0129**	-1.5543	-0.1117	True
	15-17	*60+*	-0.7274	**0.0373**	-1.4295	-0.0252	True
	18-29	*50-59*	-0.5445	**0.001**	-0.9236	-0.1653	True
	18-29	*60+*	-0.4389	**0.0035**	-0.7802	-0.0976	True
	30-39	*50-59*	-0.5182	**0.003**	-0.9174	-0.119	True
	30-39	*60+*	-0.4125	**0.0156**	-0.776	-0.0491	True

Household income	*0-0.5M*	*1.5M+*	0.716	**0.0021**	0.1782	1.2538	True
	0.5M-1M	*1.5M+*	0.5809	**0.0143**	0.0731	1.0887	True
Education	*5+ years post-sec*	*Secondary*	-0.3736	**0.0166**	-0.7049	-0.0424	True
Question 5 (I believe that decisions directly based on input from AI contribute to a good treatment)							
Age	*15-17*	*40-49*	-0.8958	**0.0027**	-1.5804	-0.2112	True
	15-17	*50-59*	-0.8739	**0.0033**	-1.5518	-0.196	True
	15-17	*60+*	-0.805	**0.0067**	-1.4638	-0.1462	True
	18-29	*40-49*	-0.4115	**0.0202**	-0.7834	-0.0396	True
	18-29	*50-59*	-0.3896	**0.0247**	-0.7492	-0.0301	True
Household income	*0-0.5M*	*1.5M+*	0.7009	**0.001**	0.1983	1.2035	True
	0.5M-1M	*1.5M+*	0.5941	**0.005**	0.1194	1.0688	True
	1.5M+	*1M-1.5M*	-0.6761	**0.0025**	-1.19	-0.1622	True
Question 6 (I think we should have legal regulations of the use of AI in the healthcare system)							
Age	*15-17*	*40-49*	0.6234	**0.0362**	0.0237	1.2232	True
Household income	*0-0.5M*	*doesn't know*	-0.5726	**0.0089**	-1.0527	-0.0926	True
	0.5M-1M	*doesn't know*	-0.5688	**0.0057**	-1.028	-0.1096	True
	No answer	*doesn't know*	-0.7111	**0.001**	-1.2152	-0.207	True

32 - Table of significant Tuckey HSD tests

Results of the Tuckey (HSD) tests while comparing to the answers to question 1

Tuckey HSD (α= 0.05)	*Comparisons*		*meandiff*	***p-adj***	*lower*	*upper*	*reject*
Question 2 (I understand how AI can participate to an efficient healthcare service)							
Answers to Q1 *Strongly agree = 5* *Somewhat agree = 4* *Neutral = 3* *Somewhat disagree = 2* *Strongly disagree = 1*	*1*	*2*	0.9508	**0.001**	0.4514	1.4503	True
	1	*3*	1.003	**0.001**	0.5281	1.4779	True
	1	*4*	1.6002	**0.001**	1.1605	2.0399	True
	1	*5*	1.8615	**0.001**	1.3988	2.3241	True
	2	*4*	0.6494	**0.001**	0.3288	0.97	True
	2	*5*	0.9106	**0.001**	0.5592	1.262	True
	3	*4*	0.5972	**0.001**	0.3163	0.8781	True
	3	*5*	0.8584	**0.001**	0.5429	1.174	True
	4	*5*	0.2612	**0.0477**	0.0016	0.5208	True
Question 3 (I think that the use of AI-based robots in the care of elderly creates ethical challenges)							
Answers to Q1	*3*	*5*	-0.4041	**0.0141**	-0.7538	-0.0545	True
Question 4 (I believe that medical doctor's decisions based on AI contribute to a good treatment)							
Answers to Q1	*1*	*4*	0.5288	**0.0424**	0.0114	1.0461	True
	3	*4*	0.4047	**0.0046**	0.0879	0.7215	True
	3	*5*	0.3938	**0.0219**	0.0373	0.7504	True
Question 5 (I believe that decisions directly based on input from AI contribute to a good treatment)							
Answers to Q1	*1*	*4*	0.4937	**0.0479**	0.0028	0.9845	True
	1	*5*	0.6037	**0.0126**	0.087	1.1204	True
	2	*4*	0.3657	**0.0316**	0.0205	0.7109	True
	2	*5*	0.4758	**0.006**	0.0947	0.8568	True
Question 6 (I think we should have legal regulations of the use of AI in the healthcare system)							
No significant differences							

33 - Table of significant Tuckey HSD tests with the answers to the question 1 as an independent variable.