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Socioeconomic status and disparities in COVID-19 vaccine uptake in Eastern Oslo, Norway

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ABSTRACT

Objective: The objective of this study was to assess whether socioeconomic status still remain a barrier to COVID-19 vaccination in eastern Oslo, Norway.
Study design: A cross-section study.
Methods: We conducted a web-based survey among the residents of six eastern parishes in Oslo, Norway. Text (SMS) messages were sent to 59978 potential participants. 5447 surveys were completed for a response rate of 9.1%. After removing participants who had not been offered the COVID-19 vaccine, we ended up with a valid sample of 4000.
Results: We find a significant association between education and the likelihood of taking the COVID-19 vaccine in bivariate logistic regression. Further, we find a significant higher likelihood of taking the vaccine in the above-low-income group compared to the low-income group. However, when we add control variables to the regression, the significant results concerning both income and education are eliminated. In further analysis, we found that age worked as a moderator between socioeconomic status and vaccine uptake: In the youngest age group (18–29), we found a significant higher likelihood of taking the vaccine in the above-low-income group compared to the low-income group, and in the higher education group compared to the primary education group.
Conclusion: Socioeconomic status remains a barrier to COVID-19 vaccination in the eastern parishes of Oslo, Norway. Indicating that Norwegians of lower socioeconomic status still disproportionately face barriers such as transportation, language, flexible work hours, and paid sick time. However, our analysis shows that this association is only found in the age group 18–29.

1. Introduction

As of April 2022, Norway has administered at least one dose of the COVID-19 vaccination to 93.1% of its population 18 years or older, translating to about 4.2 million doses [1]. Getting the vaccine is convenient for the Norwegian population. The government pays for the cost of the vaccine, the necessity to be away from work to take the vaccine entitles to sickness benefits, and most citizens have the opportunity for paid sick leave should they have side effect from the vaccine [2,3]. The government-led vaccination program started administering doses in December 2020, prioritizing residents in nursing homes and the oldest segment of the population. After this, people aged over 65 years and 18–64 years with underlying illnesses were prioritized. In response to localized high infection rates, certain areas—six eastern parishes in Oslo and four municipalities—were provided with 20% more vaccines than originally planned starting March 2021. Simultaneously, the government started vaccinating progressively younger segments of its population. In May 2021, the government intensified the skewed geographical redistribution, giving 24 municipalities – including Oslo – a 60% increase in vaccine doses due to localized high infection rates [4]. Despite the redistribution, geographical disparities in vaccine uptake emerged: In June 2021, the six eastern parishes in Oslo had an average of 77.3% vaccinated with at least one dose, while the remaining nine parishes on the south and west sides of the city had an average of 82.7%

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[5]. This disparity persisted in April 2022, where the six eastern parishes had an average of 91.8% vaccinated with at least one dose, compared to the remaining nine parishes with an average of 94.1% [6].

Compared to the south and west of Oslo, the six eastern parishes are characterized by low socioeconomic status, where residents have among the lowest levels of educational attainment and income in Oslo [7]. Several studies have identified socioeconomic status as an important predictor for vaccine uptake prior to the COVID-19 pandemic (eg. Refs. [8,9], although this association has been found to vary from country to country [10]).

Studies examining COVID-19 vaccine uptake and socioeconomic disparities also find socioeconomic status as an important predictor for COVID-19 vaccine uptake: Based on a socioeconomic score conducted by using regional employment rate, educational level, income and age distribution, a strong and positive correlation between socioeconomic status and larger vaccination percentage was detected in Israel [11,12].

In the U.S., using a sample of non-institutionalized adults 18–85 years, researchers found that lower education, lower income, lacking health insurance and having economic difficulties with household expenses were associated with lower likelihood to either plan to get vaccinated, or to have received at least one dose of COVID-19 vaccine [13,14]. Similarly, a cohort study among U.S. and U.K. participants estimated lower vaccine uptake among individuals living in communities with lower educational attainment or with lower income in both countries [15]. Furthermore, in the U.S., a higher level of social vulnerabilities among older adults, measured by the proportion of people with low income, living alone, or not having a computer with internet access, is significantly correlated with lower vaccination initiation rates in a county [16].

Although these studies all find an association between socioeconomic status and COVID-19 vaccine uptake, the studies are relatively few and limited to participants from the US, UK and Israel. Therefore, this study will contribute to the growing literature concerning socioeconomic disparities and COVID-19 vaccine uptake by analyzing survey data from six eastern parishes in Oslo, Norway. Considering these parishes are characterized by relatively low socioeconomic status and a high number of immigrants, we can oversample these otherwise hard-to-reach groups by using respondents from these areas. Further, these areas also have a relatively low number of people with COVID-19 vaccination, meaning we can analyze the relationship between socioeconomic disparities and COVID-19 vaccination with a greater variation in COVID-19 vaccination status.

Government policy in Norway was designed to make it convenient for residents to obtain the vaccine: the vaccine was provided at no cost, time off work to get the vaccine was compensated with sick leave benefits, and most citizens have the opportunity for paid sick leave should they have side effects from the vaccine [2,3]. These policies may have limited the association between socioeconomic status and vaccine uptake the literature describes, by eliminating some of the biggest barriers to care. However, even these generous policies would not be capable of eliminating all socioeconomic barriers to vaccine uptake. For example, paid sick leave is available in most salaried positions, but this is not the always the case for substitutes and part-time workers [17]. Despite efforts to provide equal access to the vaccine, barriers like transportation, childcare, and language skills could still disproportionately impact Norwegians of lower socioeconomic status. Link [18], argue that socioeconomic privilege provides resources such as knowledge, networks, money, and agency that can be flexibly deployed to improve a variety of health outcomes. This means that a policy attempt to provide equal access to vaccination may fail to address important barriers that are patterned by socioeconomic status. Therefore, we expect respondents with lower socioeconomic status, as measured by income and education, to have a lower level of COVID-19 vaccination status.

By exploring this association between socioeconomic disparities and COVID-19 vaccine uptake, we may better understand the underlying mechanisms affecting COVID-19 vaccine uptake. This will help governments tailor information about vaccines, change outreach through location, hours, and language, and customize vaccination incentives, thus helping to fight the ongoing COVID-19 pandemic.

2. Methods

2.1. Data

We conducted a web-based survey among residents of the capital city Oslo, which has been the epicenter of the COVID-19 pandemic for the past two years in Norway. The survey consisted of closed-choice Likert-type items, multiple answer questions and open-ended questions. The survey questions were developed in a collaboration between the Centre for Research on Pandemics & Society (PANSOC) at Oslo Metropolitan University and the Pandemic Centre at the University of Bergen.

The survey was carried out by Kantar on behalf of the researchers. Kantar has access to a population database with all phone numbers of Norwegian residents, from which they sampled 60,000 telephone numbers (10,000 for each of the 6 parishes). Text (SMS) messages were sent to 59978 potential participants. Recipients were directed to a web link where they were provided with further instructions and contact information, asked to consent to the survey, and allowed to select their preferred language. Responses were collected between 16 June and 24 June 2021.

2.1.1. Target population

As an initial goal was to address questions related to migrant status, we targeted six eastern parishes of Oslo where many migrants live. The survey was written in Norwegian and subsequently translated into English, Arabic, Polish, Somali, and Urdu, to encourage responses from immigrants who may not have responded to a Norwegian-language survey. However, more than 90% of respondents completed the survey in Norwegian, including many who reported being a migrant or child of migrant parents.

2.1.2. Sample

Although more than 10000 SMS recipients began the survey, 5447 surveys were completed for a response rate of 9.1%. Responses from five participants were removed during cleaning due to concerns about rapid completion speed, a large number of skipped questions and/or nonsensical answers to open-ended questions. We removed 1244 respondents who had not been offered a COVID-19 vaccine when the data was collected. Further, 198 respondents who did not answer all questions used in the analysis were removed. Resulting in a final sample of 4000.

2.1.3. Response rate and response bias

Table 1 provides a demographic breakdown of the net response rates and composition of the valid sample used in the analysis and gross samples. Valid response rates are somewhat higher for females, increase with age, and vary by parish. In the valid sample, the majority of respondents (79.2 vs. 21.8%) indicated they were born in Norway rather than another country. In the full populations of these parishes, the average percentage of migrants is estimated to be 51.2%, compared to 33.7% for Oslo in general. To correct for non-response biases in statistical analyses, population weights by sex, age group and parish were calculated and applied to statistical analyses when appropriate.

2.2. Measures

2.2.1. Dependent variable

Respondents were asked if they had been vaccinated against COVID-19, without specifying the number of doses.

2.2.2. Independent variables

Respondents were asked for their highest completed education level,

Table 1
Net response rates, composition of and differences between the net and gross samples.

	Net response rates (%)	Composition of gross sample n (%)	Composition of valid sample n (%)	Percentage points differences between valid and gross samples
Total	9.1	59978 (100)	4000 (100)	
Sex				
Male	7.4	30764 (51.3)	1624 (40.6)	−10.7
Female	10.9	29214 (48.7)	2376 (59.4)	+10.7
Age				
18-29	6.8	10849 (18.1)	408 (10.2)	−7.9
30-44	8.7	18781 (31.3)	724 (18.1)	−13.2
45-59	9.8	15267 (25.5)	1399 (35)	+9.5
60-85	10.4	15081 (25.1)	1469 (36.7)	+11.6
Parish				
Alna	8.1	12222 (20.4)	756 (18.9)	−1.5
Bjerke	9.2	8384 (14.0)	589 (14.7)	+0.7
Gamle Oslo	11.1	14761 (24.6)	1082 (27)	+2.4
Grorud	8.0	6768 (11.3)	401 (10)	−11.3
Stovner	7.4	8204 (13.7)	479 (12)	−1.7
Søndre Nordstrand	9.3	9639 (16.1)	693 (17.3)	+1.2

with possible responses of primary education; upper secondary general education; upper secondary vocational education; vocational school; university/college up to four years; and university/college more than four years. In the analysis, the two vocational responses and the two university responses were combined into single categories, respectively.

Income was divided into 9 deciles: Below 200, 200–299, 300–399, 400–499, 500–599, 600–699, 700–799, 800–999, and over 1000 (Thousand Norwegian Kroner), with the possibility to answer "Do not wish to answer". The EU considers people with a pay below 2/3 of the median pay of fulltime workers to be low paid 2017 [19]. Considering the median pay in the dataset is the 500-599 decile, we divide between 0 and 399 "Low-income" and 400 < "Above-low-income". The no answer category was also included in the dummy-set, so to not loose respondents.

2.2.3. Control variables

We control for cofounders that previous research (e.g. Refs. [12,13,15], have documented to be associated with both intent and actual uptake of COVID-19 vaccine: sex, ethnicity, and age. Further, we control for the geographical differences using the six parishes as a control variable.

3. Results

In this section we first present descriptive statistics consisting of weighted cross tables. Further, we estimated a total of six logistic regression with COVID-19 vaccine status as dependent variable. The first two models contain socioeconomical status, as measured by income and education, as independent variables. In model 3 we introduce control variables, and in model 4 and 5 we explore whether income and education are moderated by the age of the respondent. To test the absolute effect of education in the age group 30–44, we estimate a logistic regression with interaction between age and education, but we use the age group 30–44 as reference instead of the age group 18–29 (model 6). All analyses are estimated using Stata MP 17.

3.1. Descriptive statistics

In Table 2 we present weighted cross tables showing independent and control variables distribution based on COVID-19 vaccine status. Respondents with primary education, vocational education and higher education have on average similar degree of vaccine uptake, ranging from 82 to 86.1%, while respondents with upper secondary academic education have the lowest (73.4%). Respondents in the low-income group have lower vaccine uptake rates than the above-low-income group (77.2% vs 86.2%). However, those who did not answer the income question have the lowest average (72.4%). We see to some extent a larger share of women with the COVID-19 vaccine than men (84.5% vs 80.9%). Respondents born in Norway have a higher degree of vaccine coverage than respondents born outside Norway (84.8% vs 75.6%). In the different age groups, we see a considerable difference in vaccine uptake: The two younger age groups (18–29 & 30–44) have between 58.2% and 63.8% vaccine coverage, while the two oldest groups (45–59 & 60–85) have between 95% and 97.6%.

Table 2
Weighted cross table showing independent and control variables distribution based on COVID-19 vaccine status.

	Recieved COVID-19 vaccine	
	Yes	No
Educational level:		
Primary	83.8%	16.2%
Upper secondary academic	73.4%	26.6%
Upper secondary vocational	82.0%	18.0%
Higher education (college or university degree)	86.1%	13.9%
Income:		
Low income	77.2%	22.8%
Above low income	86.9%	13.1%
Will not answer	72.4%	27.6%
Gender:		
Woman	84.5%	15.5%
Male	80.9%	19.1%
Ethnicity:		
Born in Norway	84.8%	15.2%
Born outside Norway	75.6%	24.4%
Age:		
18–29	58.2%	41.8%
30–44	63.8%	36.2%
45–59	95.0%	5.0%
60–85	97.6%	2.4%

Proportions are weighted.

In Table 3 we present the results from the logistic regressions estimated with odds ratios. Model 1 shows a significantly lower odds ratio of taking the vaccine among those with upper secondary academic education compared to those with primary education (OR = 0.54, $p < 0.01$). However, the categories upper secondary vocational and higher

Table 3
Results from logistic regressions estimated with odds ratios.

Logistic regression with odds ratio	Model 1				Model 2				Model 3			
	OR (95% CI)				OR (95% CI)				OR (95% CI)			
Educational level (Primary as reference):												
Upper secondary academic	0,54	**	(0,35	0,84)	0,51	**	(0,33	0,79)	0,72		(0,43	1,21)
Upper secondary vocational	0,84		(0,54	1,29)	0,74		(0,48	1,15)	0,83		(0,50	1,40)
Higher education (college or university degree)	0,93		(0,62	1,40)	0,75		(0,49	1,13)	1,04		(0,63	1,72)
Income (Low-income as reference):												
Above-low-income					1,50	***	(1,20	1,87)	1,29		(0,96	1,72)
Will not answer					0,75		(0,55	1,01)	0,71		(0,50	1,02)
Controls:												
Woman									1,53	**	(1,23	1,90)
Born in Norway									1,39	***	(1,09	1,78)
Age (18–29 as ref)												
30–44									0,87		(0,64	1,19)
45–59									10,96	***	(7,64	15,72)
60+									21,15	***	(14,07	31,81)

Model 1: Education, Model 2: Education and Income, Model 3: Education and Income with controls (N = 4000).
* = p < 0.05, ** = p < 0.01, *** = p < 0.001.
Controlled for district = Yes.

education yield no significant results. These results persist in model 2, where income is introduced. Here we see significantly higher odds of taking the vaccine in the above-low-income group compared to the low-income group (OR = 1.50, p < 0.001). The participants who did not answer the income question yield non-significant results. Model 3 builds on the previous model by adding controls for sex, age, ethnicity and district. By adding controls, the significant associations between vaccine uptake and income and education level from model 1 and 2, are now eliminated.

The controls introduced in model 3 show a strong association with COVID-19 vaccine uptake. Significantly higher odds ratios for taking the vaccine are seen with women compared to men (OR = 1.53, p < 0.01) and those born in Norway compared to those born outside Norway (OR = 1.39, p < 0.001). The strongest associations are found for the age categories: the age groups 45–59 and 60–85 have, respectively, odds ratios of 10.96 and 21.15 compared to the group 18–29 years (p < 0.001). However, the age group 30–44 shows no significant results relative to the reference group.

In further analysis (Tables 4 and 5) we examined the association between SES and vaccine uptake in the different age groups (18–29, 30–44, 45–59 & 60–85). In the youngest age group in model 4 (Table 4), we find a significant higher likelihood of taking the vaccine in the above-low-income group compared to the low-income group (OR = 2.01, p < 0.05). The effect of above-low-income compared to low-income is significant lower in the age group 30–44 compared to the 18–29 group (OR = 0.48, p < 0.05). As we see in Fig. 1, this results in little differences between the two income groups in the age group 30–44. This is also the case for the age groups 45–59 and 60–85, where the different effects of above-low-income and low-income on vaccine uptake are similar.

Further, in model 5 (Table 5) we find an association between vaccine uptake and education in the youngest age group: The higher education group have significant higher odds of taking the vaccine compared to the primary education group (OR = 2.89, p < 0.05). Further, the effect of education is similar to the results concerning income: The effect of higher education compared to primary education is significantly lower in the age group 30–44 compared to the 18–29 group (OR = 0.16, p < 0.01). As we see in Fig. 2, of all the education levels, the higher education group have the lowest probability of taking the vaccine in the age group 30–55. However, there is little differences between the effect of education levels in the age groups 45–59 and 60–85. In further analysis in model 6 (Table 6), we explored the absolute effect between higher education and primary education in the age group 30–44 by using this age group as the reference category in the logistic regression. In this analysis we fail to find a significant effect of higher education compared

Table 4
Results from logistic regression examining the moderation effect between income and age.

Logistic regression with odds ratio	Model 4			
	OR (95% CI)			
Income (Low-income as reference):				
Above-low-income	2,01	*	(1,14	3,57)
Will not answer	0,44	**	(0,25	0,78)
Age (18–29 as ref)				
30–44	1,07		(0,65	1,76)
45–59	8,28	***	(4,50	15,26)
60–85	19,56	***	(10,65	35,92)
Income * Age:				
Above-low-income * Age (30–44)	0,48	*	(0,24	0,97)
Above-low-income * Age (45–56)	0,91		(0,40	2,10)
Above-low-income * Age (60–85)	0,87		(0,34	2,21)
Will not answer * Age (30–44)	2,44	*	(1,02	5,82)
Will not answer * Age (45–56)	2,75		(0,89	8,56)
Will not answer * Age (60–85)	1,26		(0,42	3,73)

Model 1: Education, Model 2: Education and Income, Model 3: Education and Income with controls (N = 4000).
* = p < 0.05, ** = p < 0.01, *** = p < 0.001.
Controlled for education, sex, ethnicity and district.

Table 5
Results from logistic regression examining the moderation effect between education and age.

Logistic regression with odds ratio	Model 5			
	OR (95% CI)			
Educational level (Primary as reference):				
Upper secondary academic	0,75		(0,31	1,79)
Upper secondary vocational	0,57		(0,22	1,48)
Higher education (college or university degree)	2,89	*	(1,13	7,43)
Age (18–29 as ref)				
30–44	2,20		(0,68	7,14)
45–59	9,60	***	(2,96	31,13)
60–85	19,01	***	(5,22	69,21)
Education level * Age:				
Upper secondary academic * Age (30–44)	0,72		(0,19	2,74)
Upper secondary academic * Age (45–56)	1,24		(0,32	4,79)
Upper secondary academic * Age (60–85)	3,10		(0,54	17,86)
Upper secondary vocational * Age (30–44)	1,08		(0,29	4,08)
Upper secondary vocational * Age (45–56)	1,86		(0,48	7,28)
Upper secondary vocational * Age (60–85)	2,20		(0,47	10,35)
Higher education (college or university degree) * Age (30–44)	0,16	**	(0,04	0,55)
Higher education (college or university degree) * Age (45–56)	0,63		(0,17	2,33)
Higher education (college or university degree) * Age (60–85)	0,42		(0,10	1,78)

Model 1: Education, Model 2: Education and Income, Model 3: Education and Income with controls (N = 4000).
* = p < 0.05, ** = p < 0.01, *** = p < 0.001.
Controlled for income, sex, ethnicity and district.

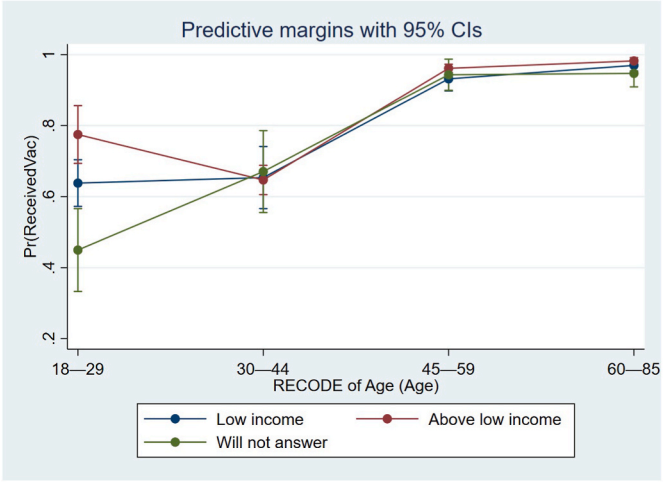

Fig. 1. Predicted association between income and vaccine uptake in different age groups.

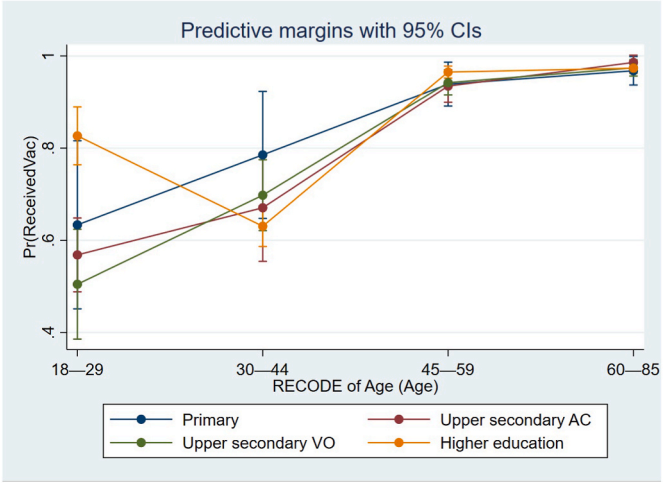

Fig. 2. Predicted association between education and vaccine uptake in different age groups.

to primary education on vaccine uptake (OR = 0.45, p > 0.05).

4. Discussion

In this study, we have found an association between socioeconomic status, as measured by education and income, and COVID-19 vaccine uptake. Our results are in line with the existing literature on the topic (e.g., Refs. [11–16]. However, while these studies find that socioeconomic disparities predict vaccine uptake, our analysis brought nuances: The association between socioeconomic status and vaccine uptake is moderated by the respondent's age. Only in the youngest age group (18–29) did we find a significant positive association between socioeconomic status and COVID-19 vaccine uptake.

Some may find it surprising to see that socioeconomic status remains a predictor of vaccination status in Norway, a country with socialized medical care that worked hard to make the vaccine available to the population. However, this finding is consistent with fundamental cause theory (Ref. [18], which argues that socioeconomic privilege can be used flexibly to improve health in a variety of ways. Even if the vaccine were offered in a socioeconomic-neutral way, Norwegians of lower socioeconomic status would still disproportionately face barriers such as transportation, language, flexible work hours, and paid sick time. An explanation to why we only find an association between socioeconomic status and vaccine uptake only in the youngest age group could be found in the correlation between age and vaccine uptake: more than 95% of respondents aged 45+ reported being vaccinated. It could be that older age groups were highly incentivized to take the vaccine because of the high risk associated with COVID-19 at older ages, or because this group was more likely to have an underlying illness or have friends/family with underlying illnesses. These incentives appear to be large enough that older adults of high and low socioeconomic status were vaccinated. While in the youngest age group, where such incentives are present to a lesser degree, socioeconomic status remains an important predictor for COVID-19 vaccine uptake.

The results concerning the age group 30–44 give interesting insight. As model 5 showed, the age group 30–44 had a significant lower effect of higher education than the 18–29 group. However, when looking at the absolute effect of education in the 30–44 group (model 6), none of the

Table 6
Results from logistic regression with moderation between income and age, using the age group 30-44 as the reference category.

Logistic regression with odds ratio	Model 6			
	OR (95% CI)			
Educational level (Primary as reference):				
Upper secondary academic	0,54		(0,20	1,49)
Upper secondary vocational	0,62		(0,24	1,56)
Higher education (college or university degree)	0,45		(0,19	1,08)
Age (30–44 as ref)				
18–29	0,45		(0,14	1,48)
45–59	4,36	*	(1,33	14,33)
60–85	8,64	**	(2,33	32,08)
Education level * Age:				
Upper secondary academic * Age (18–29)	1,39		(0,37	5,26)
Upper secondary academic * Age (45–56)	1,73		(0,41	7,27)
Upper secondary academic * Age (60–85)	4,30		(0,69	26,64)
Upper secondary vocational * Age (18–29)	0,92		(0,25	3,48)
Upper secondary vocational * Age (45–56)	1,72		(0,45	6,57)
Upper secondary vocational * Age (60–85)	2,03		(0,44	9,41)
Higher education (college or university degree) * Age (18–29)	6,45	**	(1,81	22,95)
Higher education (college or university degree) * Age (45–56)	4,04	*	(1,14	14,29)
Higher education (college or university degree) * Age (60–85)	2,72		(0,67	11,02)

Model 1: Education, Model 2: Education and Income, Model 3: Education and Income with controls (N = 4000).
* = $p < 0.05$, ** = $p < 0.01$, *** = $p < 0.001$.
Controlled for income, sex, ethnicity and district.

education levels yielded significant results. Further, as Fig. 1 showed, in the age group 30–44, there was little difference in the effects of above-low-income and low-income on the probability of taking the vaccine. Further, as shown in model 3, the 30–44 group is the only group not showing a significantly higher likelihood of taking the vaccine compared to the 18–29 group, which is reflected by similar vaccine uptake numbers: 52.2% vaccinated in the age group 18–29, versus 63.8% vaccinated in the 30–44 group (Table 2). This indicates that the aforementioned age incentives for taking the vaccine is not as important in this age group. Further research should investigate what factors that remain a barrier for COVID-19 vaccination in this age group.

5. Conclusion

Studies conducted in US, UK and Israel found a significant association between socioeconomic status and COVID-19 vaccine uptake. We find similar results in our analysis of 4000 respondents from Eastern Oslo, Norway. However, we only find a significant association in the age group 18–29. This indicates that people of lower socioeconomic status in this age group still disproportionately face vaccination barriers such as transportation, language, flexible work hours, or paid sick time. We propose that this moderation could be explained by older age groups already being incentivized to get vaccinated because of underlying illnesses or family members with underlying illnesses. However, we do not presume that these age incentives explain the lack of a significant effect in the age group 30–44, considering this group did not show significant differences in vaccine uptake compared to the younger group. We hope these findings may help public health stakeholders better target information, outreach, and vaccination incentives, thus saving resources.

Strength and weaknesses

We targeted six eastern parishes in Oslo for our data collection. These areas are characterized by residents with lower socioeconomic status and a high proportion of immigrants, making it difficult to reach them through traditional methods. By focusing on these parishes, we were able to obtain data from these otherwise hard-to-reach groups. However, this also means that we cannot compare our results with those of other areas in Oslo or Norway as a whole. Nonetheless, these parishes show considerable variation in both socioeconomic and migrant status, so the data can still be considered representative for the variables of interest in this study. It is worth noting that only 9.1% of our target population responded to our survey, and we excluded the 1244 respondents who had not been offered a COVID-19 vaccine, resulting in a response rate of 6.6%. While this may be seen as a limitation of our study, it is important to note that even surveys with low response rates can yield unbiased results and be scientifically valuable, as argued by Ref. [20].

Ethics approval and consent to participate

All methods were performed in accordance with the relevant guidelines and regulations. The study was approved by the Regional Committee for Medical and Health Research Ethics (REK, approval number 250310). Respondents were provided with instructions and contact information and asked to consent before beginning the survey. Informed consent was obtained from all participants.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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