Extent to which people perceive and accept Covid-19 vaccines in north central Vietnam

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Abstract:

To achieve herd immunity against Covid-19, the willingness of residents to get vaccinated and successful vaccination policies go hand in hand. This paper aims to understand the perceptions, acceptance, hesitation, and refusal of Covid-19 vaccines in Nghe An, Vietnam. We used an online survey to collect data during March of 2021. The Bayesian regression model (BRM) was used to identify the factors affecting vaccination decisions. The empirical results show that respondents' livelihoods were considerably affected by the Covid-19 pandemic, and there was a subtle difference in Covid-19 impacts on the lives of urban residents and their rural counterparts. In addition, respondents reported an overall positive attitude towards Covid-19 vaccination in which 84.28% were willing to get vaccinated, 14.85% were hesitant, and 0.87% refused vaccination. Their vaccination decisions were associated with vaccine side effects, information, income, job type, gender, and trust in government. Our findings offer policy implications for devising strategies for vaccine distribution in the study area and beyond.

Keywords: **Covid-19, Nghe An, vaccination, Vietnam, willingness-to-participate.**

Classification number: **4.1**

Introduction

There have been great losses of human life and resources due to the Covid-19 epidemic over the last two years. As of 5 November 2021, there have been more than 248 million Covid-19 infections and around 5 million fatalities [1]. In response, in May 2020, the 73rd World Health Assembly issued a resolution in recognition of the role of extensive immunization as a global public health goal for containment and eradication of Covid-19 [2]. Globally, there are now more than 155 vaccine candidates with 495 ongoing vaccine trials and 24 vaccines against Covid-19 approved by at least one country [3, 4]. Published research carried out mainly in high-income countries has determined that concerns about the quality and safety of vaccines due to speedy vaccine development as the primary reasons for hesitancy [5].

On a global scale, many studies have been intensively conducted to gain insights into

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vaccination decisions and determinants. A global survey of 13,426 respondents on Covid-19 vaccine acceptance done by J.V. Lazarus, et al. (2021) [6] indicates that an overwhelming percentage (75%) were likely to participate in Covid-19 vaccination of which the percentage of willingness to get vaccinated was largest in China with 90% and lowest in Russia with just under 55%. According to a study on voluntary participation in vaccine trials in France, almost 75% of survey respondents were likely to accept vaccination and 48% agreed to be vaccinated [7]. Similarly, a study by S. Sun, et al. (2021) [8] in China reported that about 64% of the surveyed people decided to participate in vaccination.

On a national scale, while investigating students' decisions on obtaining vaccines in Vietnam, Q.V. Khuc, et al. (2021) [9] found that 83.81% were willing to be vaccinated and side effects were a major obstacle to vaccine acceptance. In stark contrast with a large number of studies, responses in Jordan demonstrate that 36.1% of participants willingly accepted vaccination against Covid-19 while the remaining 63.9% either refused or remained uncertain [10]. Albeit, with many Covid-19-related studies carried out in the last two years [9-11], there is little understanding of the likelihood of vaccination participation in Vietnamese regions, which may limit vaccination strategies to some extent. Thus, this study was designed to keep policymakers and scholars in this realm informed of people's perceptions and intentions on Covid-19 vaccination in Nghe An province, which facilitates the development and deployment of strong vaccination strategies and/or public health systems in the studied area and beyond.

An in-depth understanding of what factors determine one's decision to get vaccinated is mandatory to increase the national vaccination rate in case of sufficient vaccine supply. Research in China that digs deep into concerns for participation shows that 88.91% were worried about vaccine side effects [8], followed by family dissatisfaction with an individual's vaccination (86.72%), and handicap or death that may ensue (84.36%). Additionally, studies in the UK [12] and US [13] find that vaccine hesitancy can be attributed to concern over future unknown effects of a vaccine, worry about vaccine safety, and misinformation. Vaccine safety had the closest relationship with vaccination intentions explaining 52% of unique variance in reasons to accept a recommended Covid-19 vaccine, yet, respondents' perceived risk of Covid-19 were loosely related to vaccination intention [14]. Our study aims to shed light on reasons behind respondents' vaccination decisions to assist Vietnamese authorities in encouraging participation in vaccination programmes and stepping up vaccination coverage to achieve the goal of herd immunity.

Methods

Study area

We chose Nghe An as the research area, which is a central province with the 4th largest population in Vietnam (3,547 million people) and many industrial parks. Nghe An basically stopped the first three outbreaks with only a few

cases, but in the fourth wave, the total number of cases had risen to more than 3,000 with no sign of a reduction [15]. Statistically, two-thirds of households in Nghe An are located in rural areas and many people migrate to larger cities to do business. In this 4th epidemic, reports have shown that more than 92,000 people have returned to Nghe An, which makes the pandemic scenario more and more complicated [16]. Besides, people from different places would have different cultures and perspectives that would potentially affect their decisions over vaccination. Therefore, studies on determinants of vaccine acceptance across regions also play a role in a country's vaccination programmes. With these factors highlighted, Nghe An is an ideal representative sample for investigating perceptions toward Covid-19 vaccines.

Data

Our research was designed as follows. For data collection, we went through several steps [17] including: designing the questionnaire, conducting the pilot and official surveys, and cleaning and analysing data. The first step was to compose the questionnaire, which took us more than two weeks to complete. The first draft of the questionnaire was given to a focus group for further review to ensure that all necessary fields of information were included, and all the questions were concise, clear, easy to understand, and appropriate. The official questionnaire had 31 questions divided into four sections: (1) people's perceptions of Covid-19's reality (including six questions, with some being multiple choices grids), (2) perceived importance of vaccines and vaccine dimensions, (3) decision to get vaccinated and reasons, and (4) the demographics of the respondents. Throughout the surveying process, we carefully took note of members, held regular meetings to keep track of work progress, and worked out solutions to any problem that arose. For the official (final) survey on a large scale, the questionnaire was randomly distributed by a variety of means such as email and social media in Nghe An province. After nearly one month of surveying from March 2021 to April 2021 and data cleansing, we obtained 229 observations. For data analysis, a dataset was coded and entered into an Excel file for analysis.

Regression model

Following Refs. [9, 18, 19], we used descriptive statistics (i.e., Mann Whitney test with 95% confidence intervals) to explore the data and used the BRM to investigate the predictions of people's vaccination decision and its relationships with 12 factors (Fig. 1). The model had 12 independent variables (see more in Appendix Table A1) that were categorized into four major factor groups: perception of Covid-19, perception of the vaccine, respondents' demographics, and vaccination decision. The following section is an example of sampled code (Box 1) that was used to command the Bayesian package to create the hierarchical Vaccination Decision model. Next, Fig. 1 illustrates the logical network of our model in which the arrow denotes the direction from the independent variables to the dependent variable and the length has no symbolic importance.

Box 1. The design of the model.

```
model1a<-bayesvl()
model1a<-bvl_addNode(model1a,"VaccineDeci","binom")
model1a<-bvl_addNode(model1a,"Income_effect","norm")
model1a<-bvl_addNode(model1a,"Gender","binom")
model1a<-bvl_addNode(model1a,"Mem_quaran-
tine","norm")
model1a<-bvl_addNode(model1a,"Insurrance","norm")
model1a<-bvl_addNode(model1a,"Freq_vaccina-
tion","norm")
model1a<-bvl_addNode(model1a,"Satis_gov","norm")
model1a<-bvl_addNode(model1a,"Job_type","norm")
model1a<-bvl_addNode(model1a,"Town","norm")
model1a<-bvl_addNode(model1a,"Vaccine_Impor-
tance","norm")
model1a<-bvl_addNode(model1a,"Sideeffect_impor-
tance","norm")
model1a<-bvl_addNode(model1a,"Chronic_disease","norm")
model1a<-bvl_addNode(model1a,"Age","norm")
```

Model formula (1):

VacciDeci ~ Age + Chronic_disease + Sideeffect_importance + Vaccine_importance + Town + Job_type + Satis_gov + Freq_vaccination + Insurance + Mem _quaratine + Gender + Income_ effect

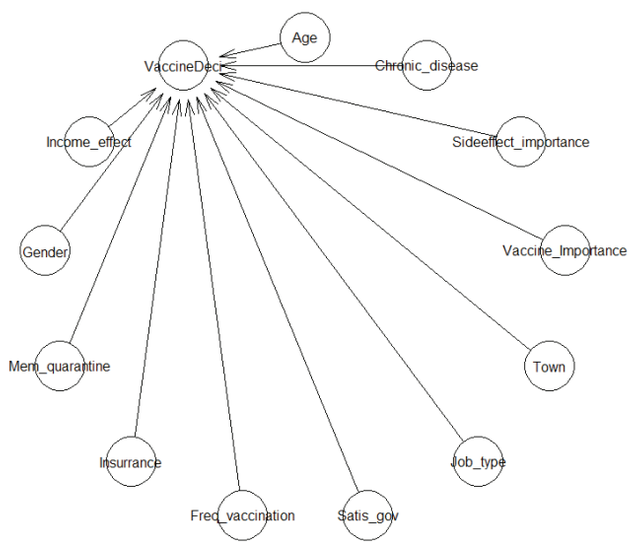

Fig. 1. The model of vaccination decision.

Results

Exploratory results

Table 1 presents households' perceived Covid-19 impacts, perceptions of Covid-19 vaccine, demographics, and vaccination decision. Regarding demographics, males and females accounted for 41.5% and 58.5%, respectively, and those aged 31-50 constituted roughly half (45.42%) of all respondents surveyed.

Notably, residents were reported to sustain considerable adverse effects from Covid-19 (3.35/5), and most Nghe An residents believed that vaccines played an important role in controlling the Covid-19 pandemic with a score of 4.79. Although a large number of people saw Covid-19 as a danger (4.74/5), their confidence in Vietnam's win against Covid-19 (4.83/5) and satisfaction with governing bodies' countermeasures (4.77/5) remained high. Another point worth mentioning is that side effects and vaccine origins received a great deal of attention with rates of 4.6/5 and 4.41/5, respectively.

Figure 2 compares people's decisions on Covid-19 vaccination in rural and urban areas. It can be seen that these two groups recorded a similar patterns in proportions of different categories. In total (Fig. 2C), over four-fifths of respondents agreed to participate in vaccination, which was made up of those who chose to pay upfront for early vaccination (46.29%) and those who proceeded to wait for free vaccines from the government (37.99%). The figure for vaccine-hesitant urban respondents was around 8% higher than that of their rural counterparts. None of the surveyed people in urban areas refused to be vaccinated, and only a few rural residents refused vaccinations (2 in 156).

Table 1. The perception, impact of Covid-19, and the decision on vaccine selection of Nghe An households.

Perception, impact of Covid-19 and decision on vaccine selection of Nghe An households (N=229)		Mean	Std. error	Min	95% confidence interval of the difference			
					Lower	*Upper*	Max	*Range*
Perception about Covid-19	Income effect	3.08	.075	1	2.93	3.23	5	4
	Social effect	3.12	.063	1	2.99	3.24	5	4
	Work effect	2.90	.081	1	2.74	3.06	5	4
	General effect	3.35	.064	1	3.22	3.48	5	4
	Danger level	4.74	.040	1	4.66	4.82	5	4
	Infect probability	3.39	.081	1	3.23	3.55	5	4
	Government satisfaction	4.77	.035	1	4.70	4.84	5	4
	Assurance level	4.70	.041	1	4.62	4.78	5	4
	Faith in future victory	4.83	.030	2	4.77	4.89	5	3
Perception about vaccine Covid-19	Vaccine importance	4.79	.034	2	4.72	4.86	5	3
	Origin importance	4.41	.055	1	4.31	4.52	5	4
	Side effect importance	4.60	.044	1	4.52	4.69	5	4
	Price importance	4.24	.064	1	4.11	4.37	5	4
	Effectiveness importance	4.79	.031	2	4.73	4.85	5	3
	Convenient importance	4.59	.046	1	4.50	4.68	5	4
Vaccination decision	Vaccination decision	3.30	.049	1	3.20	3.39	4	3
Demographics	Gender	.41	.033	0	.35	.48	1	1
	Age	3.03	.088	1	2.85	3.20	6	5
	Chronic disease	.34	.045	0	.26	.43	1	1
	Mem quarantine	.09	.024	0	.04	.13	1	1
	Insurance	.94	.021	0	.90	.98	1	1

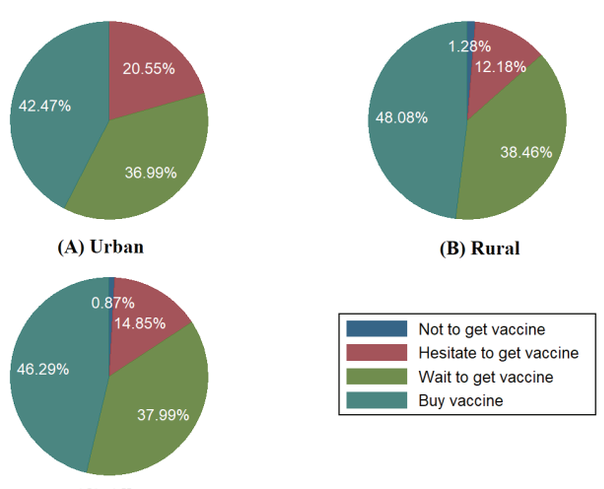

Fig. 2. Decision to participate in Covid-19 vaccination.

Figures 3 and 4 provides information on reasons for vaccine hesitancy and refusal. As clearly presented, vaccine side effects and insufficient information on Covid-19 were two main reasons for Covid-19 hesitancy. To be more specific, 21/34 respondents were discouraged from vaccination by vaccine side effects, followed by "incomplete information" (19/34) (Fig. 3). The number of participants that was put off by vaccine safety, effectiveness and other preventive measures stood at only under 10. Similarly, side effects and incomplete information are found to rank first and second as factors that induce vaccination refusal (Fig. 4).

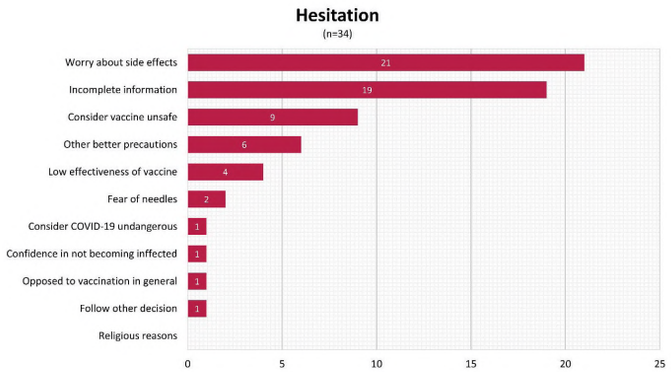

Fig. 3. Reasons for Covid-19 vaccine hesitation.

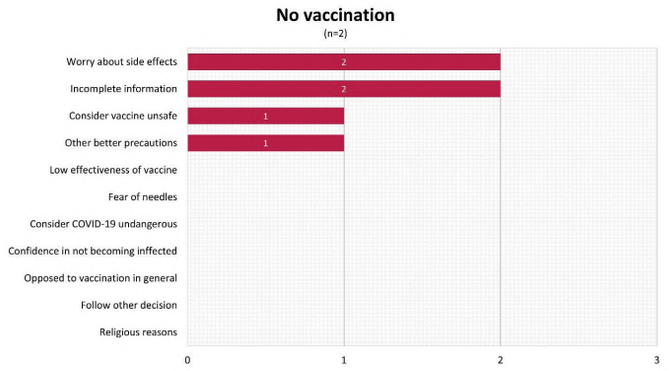

Fig. 4. Reasons for Covid-19 vaccine refusal.

Table 2 compares perceptions of Covid-19, perceptions of Covid-19 vaccine, demographics, and vaccination decisions among urban and rural residents. By and large, no difference in perceived effects of Covid-19 was witnessed between the two groups, and their satisfaction with the government and strong confidence in national future victory were shown to insignificantly differ. The number of urban residents contracting chronic diseases was significantly higher than that of rural residents, yet those in the countryside deemed danger from Covid-19 more serious than those

Table 2. Difference in perception and decision between the two areas.

Comparison between urban and rural		Urban (N=73)				Rural (N=156)				Sig.
		Mean	*Std. error*	*Min*	*Max*	*Mean*	*Std. error*	*Min*	*Max*	*(Mann Whitney U test)*
Perception	Income effect	3.08	.117	1	5	3.08	.096	1	5	.846
	Social effect	3.07	.088	1	5	3.14	.083	1	5	.700
	Work effect	2.86	.137	1	5	2.92	.101	1	5	.938
	General effect	3.38	.113	1	5	3.33	.078	1	5	.592
	Danger level	4.62	.077	2	5	4.79	.045	1	5	.010
	Infection probability	3.26	.145	1	5	3.45	.098	1	5	.301
	Government satisfaction	4.82	.056	2	5	4.74	.044	1	5	.203
	Assurance level	4.73	.065	2	5	4.69	.052	1	5	.858
	Faith in future victory	4.85	.054	2	5	4.82	.036	2	5	.473
Knowledge about vaccine Covid-19	Vaccine importance	3.370	.067	3	5	3.526	.039	2	5	.654
	Origin importance	3.507	.093	1	5	3.686	.068	1	5	.019
	Side effect importance	3.219	.090	1	5	3.417	.049	1	5	.023
	Price importance	3.740	.117	2	5	3.827	.077	1	5	.042
	Effective importance	3.603	.062	2	5	3.641	.035	2	5	.150
	Convenient importance	4.58	.083	2	5	4.60	.055	1	5	.793
Vaccination decision	Vaccination decision	3.22	.090	2	4	3.33	.059	1	4	.272
Demographics	Gender	.42	.058	0	1	.41	.040	0	1	.837
	Age	3.23	.167	1	6	2.93	.103	1	6	.068
	Chronic disease	.53	.092	0	2	.26	.048	0	2	.002
	Mem quarantine	.07	.036	0	2	.10	.031	0	2	.765
	Insurance	.95	.038	0	2	.94	.025	0	2	.843

Table 3. Summary of the estimated coefficients from the hierarchical vaccination decision model.

Variables	mean	se_mean	sd	2.5%	25%	50%	75%	97.5%	n_eff	Rhat
a_VaccineDeci	-5.75	0.03	2.82	-11.37	-7.62	-5.78	-3.85	-0.28	6604	1
b_Income_effect_VaccineDeci	0.71	0.00	0.23	0.28	0.56	0.71	0.87	1.18	8275	1
b_Mem_quarantine_VaccineDeci	2.42	0.02	1.25	0.58	1.56	2.23	3.07	5.37	5988	1
b_Insurrance_VaccineDeci	-1.96	0.01	0.85	-0.70	-2.50	-1.93	-1.38	-0.38	9148	1
b_Freq_vaccination_VaccineDeci	0.41	0.00	0.18	0.07	0.29	0.41	0.53	0.78	7679	1
b_Satis_gov_VaccineDeci	0.75	0.00	0.38	0.03	0.50	0.75	0.99	1.52	8284	1
b_Job_type_VaccineDeci	0.98	0.00	0.35	0.30	0.74	0.98	1.22	1.69	7520	1
b_Town_VaccineDeci	-0.93	0.00	0.48	-1.89	-1.25	-0.93	-0.59	0.01	9619	1
b_Gender_VaccineDeci	1.97	0.01	0.58	0.91	1.56	1.95	2.34	3.16	9275	1
b_Older_children_VaccineDeci	-0.65	0.00	0.43	-1.49	-0.94	-0.64	-0.36	0.20	11149	1
b_Vaccine_Importance_VaccineDeci	0.60	0.00	0.41	-0.19	0.32	0.60	0.87	1.41	8821	1
b_Sideeffect_importance_VaccineDeci	-0.66	0.01	0.48	-1.63	-0.98	-0.64	-0.32	0.23	7694	1
b_Chronic_disease_VaccineDeci	0.33	0.00	0.35	-0.33	0.09	0.32	0.56	1.03	8915	1
b_Age_VaccineDeci	0.08	0.00	0.21	-0.32	-0.06	0.08	0.22	0.50	8332	1

in cities (p-value=0.01). Furthermore, there are statistically significant differences in perceptions of vaccine prices (p-value=0.042) and side effects (p-value=0.023) between the respondents of the two regions. It is noted that although differences in residents' attitudes towards vaccine and vaccine effectiveness were negligible, their opinions on the importance of vaccine origins differed significantly.

Empirical results

Table 3 presents the results of the Bayesian regression model that investigates decisions on vaccination and its interactions with 12 independent variables. Because the effective sample size (n_eff) is higher than 1000 and Gelman shrink factor (Rhat) equals 1, convergence is confirmed in our model. Fig. 5 illustrates the trace plots of the posterior parameters. Markov chains fluctuate around a central equilibrium with a high density of plots of variance suggesting that the Markov property is held. Figs. 6 and 7 show the distribution of parameters from the BRM.

As illustrated in Figs. 6, 7 and 8, independent variables such as income effect, gender, insurance, frequent vaccination, government satisfaction, and job type have a statistically significant effect on vaccination decision. From the simulated posterior results, we found that the perceived effect of Covid-19 on income was positively associated with the intention to get vaccinated (mean=0.71, sd=0.23). The type of job held by the respondent also had a positive relationship with vaccination acceptance (mean=0.98, sd=0.35). Additionally, respondents whose family members were once under quarantine were more likely to agree to be vaccinated (mean=2.42, sd=1.25). It was also suggested that males and respondents without insurance were more likely to agree to vaccination (mean=1.97, sd=0.58 and mean=-1.96, sd=0.85). We also found that age and chronic disease were associated with vaccination acceptance albeit with weak confidence.

Discussion

The complicated developments of Covid-19, insufficient related research in developing countries, and Vietnam's diverse cultures encouraged us to design this study to understand perceptions and

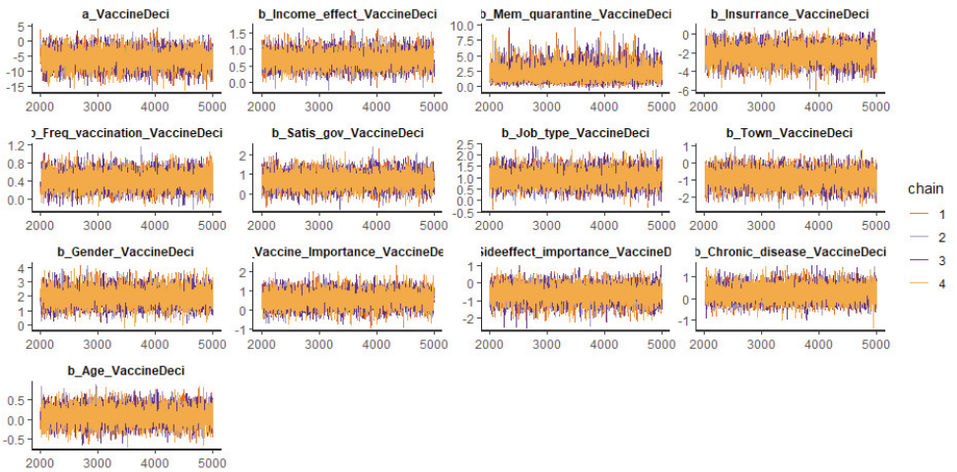

Fig. 5. The MCMC chains for the Bayesian model of vaccination decision.

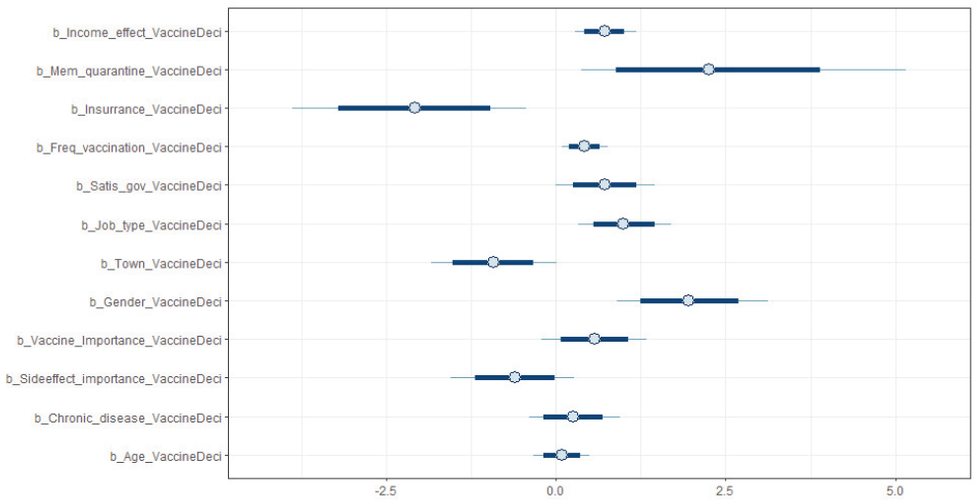

Fig. 6. Distribution of the coefficients of factors influencing vaccine decisions.

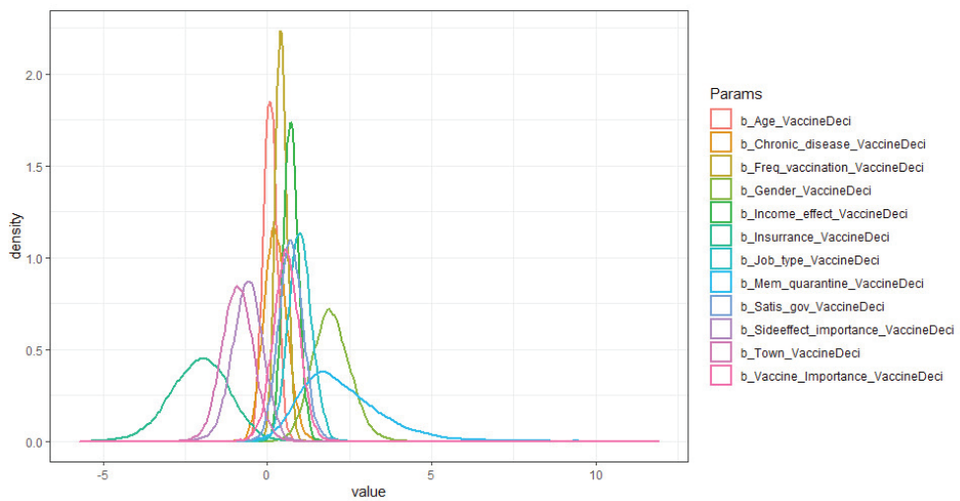

Fig. 7. Posterior coefficients of the vaccination decision model.

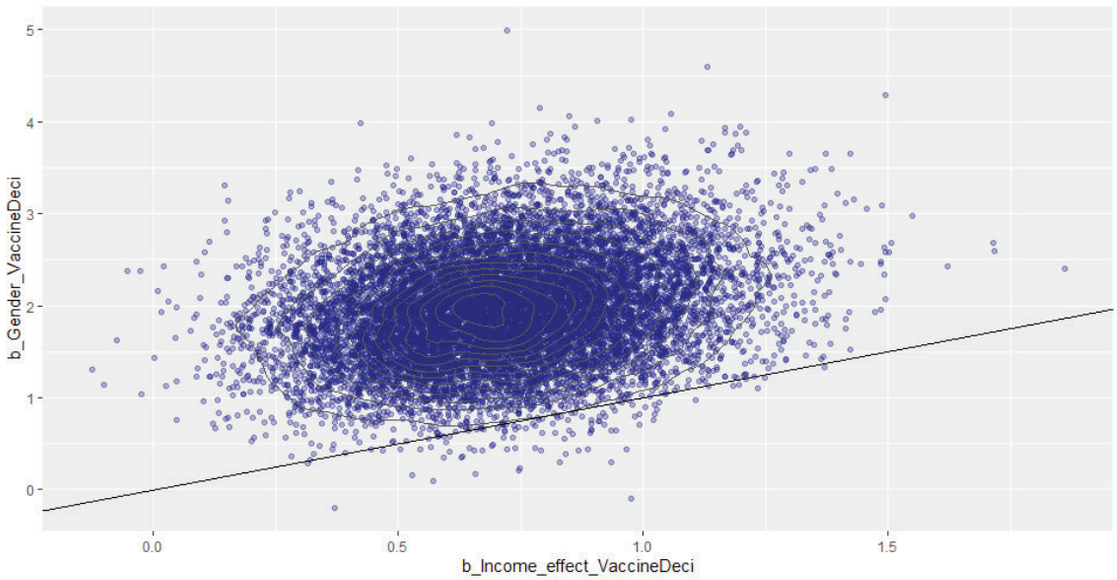

Fig. 8. Comparative densities between *b_Gender_VaccineDeci* and *b_Income_effect_VaccineDeci*.

intentions regarding Covid-19 vaccination in Nghe An province. Using descriptive statistics and a Bayesian regression model, we obtained several findings.

Firstly, our results indicate the high likelihood of success of Covid-19 vaccination because of a high rate of potential vaccination participation. To be more specific, 84.28% of the participants were willing to be vaccinated against Covid-19 if a vaccine was available (Fig. 1). This willingness was in line with many other findings [9, 20, 21]. Covid-19 is reported to emerge as a great danger to most households in Nghe An province (Table 1), which encourages people's acceptance of vaccines [22, 23]. Moreover, those who trust the health system were 3.05 times as likely to accept the vaccine than those that did not [23], and those who adhere to government regulations such as wearing masks, social distancing, or lockdown were more willing to participate in Covid-19 vaccination [24]. Tables 1 and 2 denote a high level of trust in the government and the high authorities' ability to combat Covid-19, which partly explains the high willingness to obtain vaccines.

Secondly, vaccination hesitancy is associated with numerous variables/reasons including vaccines' side effects and insufficient information (Fig. 3 and Table 3), job type, gender, and trust in government (Table 3). These results are highly consistent with many earlier published works [25-27]. Whether a person has adequate knowledge of Covid-19 vaccines or lacks sufficient information can influence vaccine acceptance or hesitancy [28]. Individuals who found information provided by health authorities inconsistent or contradictory had higher odds of vaccine refusal than those who found the information clear and understandable [29]. Therefore, information on Covid-19 vaccines should be communicated clearly via official channels under government control with a high degree of transparency to promote trust [4]. Similarly, actions must be taken to alleviate fears of vaccine side effects and comfort residents with huge benefits of vaccination. Besides,

it is advisable that policymakers take into consideration other key factors such as gender and job type when devising plans and/or public policies to further increase participation in the vaccination programme.

Thirdly, the differences in perceptions between rural and urban residents were also highlighted in the results. To be more precise, the danger level of Covid-19 appears to be much more severe to rural populations than to its urban counterpart. Rural residents are more concerned about vaccine prices than city dwellers (Table 2).

Fourthly, our study suggests that exploratory analysis coupled with empirical analysis by a Bayesian model could be a favourable approach to capture more information and to identify and confirm the influence of key variables of vaccination decisions.

Following [30], we fully acknowledge that our research has some limitations. The online survey method has some inherent disadvantages. We, however, improved data quality by carefully designing, revising, and improving the questionnaire with the help of a focus group. We also acknowledged that a small sample size (N=229) may influence the quality of generalized conclusions, but we minimize and overcome this issue by employing a Bayesian model, which, by definition, does not require strict assumptions regarding large sample sizes. The cost associated with the investment in vaccine research and production is also overlooked in this study, and it should be noted in future research [31].

Conclusions

The vaccine acceptance rate greatly varies among countries and regions, and the willingness to obtain vaccines is key to a successful vaccination programme. However, there is scant research on this area of interest in developing countries that are heavily hit by Covid-19. The purpose of this study was to gain a better understanding of perceptions of Covid-19 impacts and motivations for vaccine acceptance or refusal in Nghe An by employing descriptive statistics and a Bayesian regression model. Our research findings suggested that those who were willing to obtain Covid-19 vaccines were in the majority, which was in line with previous studies. Vaccine-hesitant respondents considered vaccine side effects as a discouragement to vaccine acceptance. Apart from concerns about side effects, guaranteeing transparency in Covid-19 vaccine information and using official channels as the primary means of communication should be prioritized to consolidate trust and encourage public participation in vaccination programmes. In addition, residents in Nghe An had strong confidence in the government and Vietnam's future victory over Covid-19. Our results provide insights to promote vaccination, and a substantial difference in intentions on vaccination between males and females may assist governing bodies in devising policies tailored to the needs of each group. This study offers implications for developing nations to increase the likelihood of vaccination success and provides guidance for comparative research in other countries and/or regions in Vietnam to speed up vaccine administration for community immunity.

Appendix

Table A1. Variables description.

Variables	Variable code	Meaning	Measurement
Income effect	Income_effect	The impact of Covid-19 on respondents' income. Scale 1-5.	1=Very low; 2=Low; 3=Medium; 4=High; 5=Very high.
Habit effect	Habits_effect	The impact of Covid-19 on respondents' social habits. Scale 1-5.	1=Very low; 2=Low; 3=Medium; 4=High; 5=Very high.
Work effect	Work_effect	The impact of Covid-19 on respondents' work. Scale 1-5.	1=Very low; 2=Low; 3=Medium; 4=High; 5=Very high.
General effect	General_effect	The impact of Covid-19 on respondents' life. Scale 1-5.	1=Very low; 2=Low; 3=Medium; 4=High; 5=Very high.
Danger level	Danger_level	Perceived danger of Covid-19. Scale 1-5.	1=Very safe; 2=Safe; 3=Neutral; 4=Dangerous; 5=Very dangerous.
Infect probability	Infect_prob	Perceived the risk of infection Covid-19. Scale 1-5.	1=Very low; 2=Low; 3=Medium; 4=High; 5=Very high.
Government satisfaction	Satis_gov	Trust in government. Scale 1-5.	1=Very dissatisfied; 2=Dissatisfied; 3=Normal; 4=Satisfied; 5=Very satisfied.
Assure Level	Assure_evel	Perceived safe living in Vietnam. Scale 1-5.	1=Very unassured; 2=Unassured; 3=Normal; 4=Assured; 5=Very assured.
Faith win	Faith_win	Confidence level to win the upcoming epidemic. Scale 1-5.	1=Highly doubtful; 2=Doubtful; 3=Normal; 4=Trust; 5=Complete trust.
Vaccine importance	Vaccine_importance	The importance of vaccines. Scale 1-4.	1=Not important; 2=Less important; 3=Important; 4=Very important.
Origin importance	Origin_importance	The importance of vaccines' origin. Scale 1-4.	1=Not important; 2=Less important; 3=Important; 4=Very important.
Side effect importance	Sideeffect_importance	The importance of vaccines' side effect. Scale 1-4.	1=Not important; 2=Less important; 3=Important; 4=Very important.
Price importance	Price_importance	The importance of vaccines' price. Scale 1-4.	1=Not important; 2=Less important; 3=Important; 4=Very important.
Effective importance	Effective_importance	The importance of vaccines' effectiveness. Scale 1-4.	1=Not important; 2=Less important; 3=Important; 4=Very important.
Convenient importance	Convenient_importance	The importance of vaccines' convenience. Scale 1-4.	1=Not important; 2=Less important; 3=Important; 4=Very important.
Vaccination decision	Vaccination_decision	Respondents' decisions on getting Covid-19 vaccination. Scale 1-4.	1=Not important; 2=Less important; 3=Important; 4=Very important.
Gender	Gender	Gender. Binary variable.	0=Female; 1=Male.
Age	Age	Age. Scale 1-6.	1=under 23; 2=from 24 to 30; 3=from 31 to 40; 4=from 41 to 50; 5=from 51 to 60; 6=above 60.
Chronic disease	Chronic_disease	Chronic disease. Binary variable.	1=yes; 0=no; 2=I don't know.
Mem quarantine	Mem_quarantine	Friends or family are quarantined. Binary variable.	1=yes; 0=no; 2=I don't know.
Insurance	Insurance	Insurance of respondents. Binary variable.	1=yes; 0=no; 2=I don't know.
Older children	Older_children	Families with children/the elderly. Binary variable.	1=yes; 0=no; 2=I don't know.
Job type	Job_type	Working area of respondents. Scale 1-4.	1=No working; 2=Working for private; 3=Working for state; 4=Retired.
Town	Town	Urban/Rural. Binary variable.	1=Urban; 0=Rural.

COMPETING INTERESTS

The authors declare that there is no conflict of interest regarding the publication of this article.

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