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# Risk perception, emotions, social norms, trust, and attitudes towards vaccination

Agnalys Michaud<sup>1</sup>

## Abstract

The covid-19 crisis caused unprecedented health and economic disruption. The end of the crisis was made possible by the adoption of health measures: barrier measures and, above all, vaccination of a large proportion of the population. A detailed understanding of the factors determining risk perception and acceptance of vaccination therefore seems essential. In this article, based on a survey of 12,000 people in three countries, we explore the effects of this ideology, trust, emotions, and social norms.

We confirm the role of ideology and add dimensions by assessing their sensitivity to fake news or conspiracy theories. We also corroborate that emotional state has a strong influence on attitudes. If the situation in their country generates anger, they are more likely to oppose vaccination. On the other hand, if they are worried or express hope, they are more likely to adopt a favorable attitude to vaccination. We show that social norms concerning the behavior expected by those around them have a decisive effect.

Keywords: Vaccination, Covid-19; Trust, Emotions, Conspiracy, Social Norms

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The covid 19 crisis caused unprecedented health and economic disruption. The mitigation of the pandemic was, among other things, possible by the acceptance of vaccination by many people. Therefore, a detailed understanding of the factors determining Covid-19 risk perception and vaccination acceptance seems essential. To analyze risk perception, we use a holistic approach that advocates considering normative and moral aspects but also the level of understanding and knowledge to analyze attitudes toward risk (Van der Linden, 2015; Xie et al., 2019; Dryhurst et al., 2020; Van Bavel et al., 2020).

Work on the level of knowledge (vs. misperception) that individuals possess shows that, under certain conditions, providing information can change their perceptions, judgments, attitudes, opinions, and so-called preferences (Kuziemko et al., 2015; Alesina et al., 2018; Stantcheva, 2020; Alsan et al., 2020a; Alsan et al., 2020b, Dechezleprêtre, et al., 2022). In other words, the level of understanding an individual has in the face of a situation deemed risky is crucial to comprehend their behaviors. Secondly, there is a great deal of evidence to show that trust is an essential component of compliance with COVID-19 preventive measures (Algan et al., 2021; Bargain & Aminjonov, 2020; Barrios et al., 2021; Brodeur et al., 2021; Durante et al., 2021; Engle et al., 2020). More specifically, Kerr et al. (2020) find that trust in medical and scientific experts and the fact of worrying about the virus appear as the most consistent predictors of reported vaccine acceptance across countries. Lastly, numerous experiments have demonstrated that providing social information (i.e., referring to the behaviors of other individuals) significantly modified behavior (Schultz, 1999; Schultz et al., 2007; Ferraro & Price, 2013; Bicchieri et al., 2018; Bicchieri & Dimant, 2019; Dimant et al., 2020; Dimant & Gesche, 2020). Experiments show that individuals tend to conform to the most frequent behavior. Sometimes, this taste for conformity can lead to the disappearance of the most virtuous behaviors. This phenomenon is called the boomerang effect. However, field experiments show that a significant proportion of the population can adopt virtues and acceptable behaviors when promoting the injunctive dimension of normative behavior.

This paper uses a survey asked in three countries: France, the United Kingdom, and Germany to 12,000 people. We pay particular attention to the effect of trust between individuals, trust towards scientists, or governments on attitudes toward COVID-19. We also analyze the level of information individuals have regarding COVID-19. To do so, we analyze their sensitivity to fake news and misperception of the risks associated with COVID-19 and vaccination. We also consider everyone's emotional state towards COVID-19 situation.

To understand the effect of the social norm, we determine the extent to which pro-vaccination is perceived as a widely adopted and desirable attitude. In other words, to what extent do they consider that those around them will adopt it and expect themselves to adopt it? On the one hand, we analyze the extent to which individuals perceive that the pro-vaccination attitude is shared by their social circle and, on the

other hand, the perceptions, and beliefs of individuals regarding the expected attitude.

This article's specific result and main contribution are that social norms, more precisely social expectations, play a significant role in attitudes toward vaccination. Individuals who agree with the statement *that most people they care about will be vaccinated* and *that most people they care about think that they should get vaccinated* are more likely to get vaccinated and reciprocally, i.e., if individuals disagree with these statements, they are less likely to get vaccinated. It reflects that individuals are sensitive to a descriptive norm and an injunctive norm of individuals they identify with.

Moreover, we are confirming results found elsewhere. Refusal to vaccinate is positively correlated with a misperception of the risk. We are also providing new insights showing that sensitivity to fake news and conspiracy theories is a determinant of anti-vaccination attitudes. With respect to trust, we confirm that trust in scientists plays a significant role in vaccination acceptance. However, we do not find convincing effects of trust in government and citizens on attitudes toward vaccination. Lastly, we provide insights showing emotional states play a role in vaccination attitudes. Anger is a determinant of vaccination refusal, while the fact to be worried is a determinant of a pro-vaccination attitude. This work is contributing by providing a synthesis of the factors that impact vaccination acceptance.

### **Hypothesis and theoretical framework**

Vaccination against COVID-19 can be conceptualized as a public good game with a threshold. Indeed, for vaccination to be efficient and to limit the spread and the magnitude of the virus, a sufficient percentage of the population must accept it. These individuals endure the cost of vaccination to protect the whole population, avoiding the congestion of medical services and implementing restrictive measures, such as the lockdown, that profoundly impact the economy. On the individual scale, each one evaluates, on one side, the risks that COVID-19 represents at an individual and a global level, and on the other side, the risks, and the benefits that vaccination represents for themselves and at a more expansive extent.

In this article, we are not referring to the traditional rational choice model that assumes individuals have complete and perfect information and can calculate accurate and precise probabilities of the consequences of each of their possible actions. We neither consider that individuals' choices are governed by cold calculations in which emotions have no place. Behavioral economics has long demonstrated that they cannot be explained by such narrow assumptions (Camerer, 2003). However, this does not mean those choices are dictated by erratic impulses in which logic and reason would have no place. Instead, we consider that when making choices, individuals mobilize scripts and schemata to evaluate the risks and benefits of an action; the latter is the result of social constructions and individual characteristics. Firstly, these scripts result from ideologies and individual beliefs and

are reflected in their sensitivities to fake news and, so, in their level of trust; they are also influenced by social norms, which we will consider to a greater extent in this article. Secondly, the choices are also influenced by affective dimensions. Many authors have pleaded for the affective and visceral dimension to be considered as one of the factors that influences information processing and judgment (Loewenstein et al., 2001; Slovic et al., 2004) and also political choices (Marcus, 2003). Vasilopoulos et al., 2023 and Brouard et al., 2020, demonstrate that in the COVID-19 pandemic, experiencing fear was a strong determinant of the support toward barrier measures and the restriction of liberty.

Let us first consider the elements used to settle a judgment and a choice because they influence our beliefs and degree of conviction and help us identify which behavior to adopt in a complex situation.

Regarding attitudes toward COVID-19, numerous authors demonstrate that the acceptance of protective measures, which can be analyzed with the same public good theoretical framework, is influenced by trust (Algan et al., 2021; Bargain & Aminjonov, 2020; Barrios et al., 2021; Brodeur et al., 2021; Durante et al., 2021; Engle et al., 2020, Galasso et al., 2022). These authors show that mobility reduction is more significant in the United States and Italy when the level of trust in their fellow citizens is high. This horizontal trust is considered a proxy of social capital and is, therefore, seen as a factor likely to foster cooperation. Algan et al., 2021, who consider many European states and address vaccination acceptance, find more contrasted results. They show that, at the individual level, trust in scientists is a more critical driver of vaccination acceptance than trust in others or trust in governments. Galasso et al., 2022 also found that trust in scientists is a determinant of vaccination intentions. Kerr et al., 2020, also found that trust in scientists is a reliable predictor of vaccination acceptance. Vertical trust is likely to increase the collective and individual benefits that individuals perceive from vaccination campaigns, allowing them to better understand the benefits that vaccination can have on their health, the health system, and the economy. When people trust an entity, they are more likely to consider the message they deliver true. In this specific case, individuals are more likely to consider, on one side, the risks related to COVID-19 and, on the other side, the benefits of vaccination to be actual.

*H1: We hypothesize that when individuals trust scientists, they are more likely to accept vaccination.*

Another dimension influencing the willingness to be vaccinated is the sensitivity to fake news and conspiracy theories (Roozenbeek et al., 2020). High sensitivity to these latter is a strong determinant of an attitude against vaccination since the narrative of fake news presents vaccination against COVID-19 as highly harmful for the individual, presenting high risks for his health. At a broader level, vaccination is presented as an act of deprivation of liberty that would systematically lead to more significant deprivation. Additionally, mistrust toward COVID-19 vaccination and

sensitivity to fake news is more frequently observed when people have extreme political positions, mainly far-right positions. This effect of political ideology is particularly pronounced in the United States of America. Engle et al., 2020, demonstrate that states with a higher proportion of Republican voters were less likely to reduce their mobility. Brodeur et al., 2021 demonstrate that, in contrast, Democrat states are more likely to reduce mobility. Gelfand et al., 2022, found that political ideology strongly determines the willingness to wear a mask and that Republicans were less likely to be sensitive to measures that promote masks. More widely, Van Prooijen et al., 2015 demonstrate that individuals with political extremism positions are more likely to endorse conspiracy beliefs.

*H2: We hypothesize that the more individuals are sensitive to extreme ideology and fake news, the more likely they have an anti-vaccination attitude.*

Social norms have been demonstrated to strongly influence behaviors in various situations, such as water and energy consumption or recycling and adopting preventive measures (Schultz, 1999; Schultz et al., 2007; Ferraro & Price, 2013). Nevertheless, to our knowledge, little evidence investigates how social norms may influence people's willingness to be vaccinated. To better understand how social norms may influence behaviors, it is necessary to define them. Bicchieri (2006) specifies two conditions that apply only to social norms and, thus, enable us to distinguish them from moral values, which demand an unconditional commitment, and from collective habit. Firstly, social norms must have a contingency dimension. It means that individuals know that in a specific situation, a behavioral rule exists: the norm. In other words, when individuals face complex situations where they cannot identify all possible actions and, more importantly, identify and calculate their precise consequences, they can identify a behavior likely to benefit everyone. Secondly, social norms depend on conditional preferences. It implies that the willingness to conform to a social norm depends on beliefs about the behaviors and the expectations of others. To be more specific, to respect a social norm, individuals must believe that a sufficient proportion of the population i) will respect (first-order beliefs) and ii) expect them to do the same (second-order beliefs). If they do not adopt this behavior, they might be subjected to symbolic or monetary sanctions. Thus, social norms contain descriptive and injunctive dimensions (Schultz, 1999; Schultz et al., 2007). The descriptive dimension refers to what people believe others are doing, while the injunctive dimension refers to people's beliefs about what others ought to do. This injunctive dimension conveys a moral judgment of the individual's behavior compared to the expected behavior. Experiments demonstrate that providing only the information about what others are doing, the descriptive norm, is insufficient. For the norm to be activated, the message must contain an injunctive dimension (Schultz, 1999; Schultz et al., 2007; Ferraro & Price, 2013; Bicchieri et al., 2021; Bicchieri & Dimant, 2022). To sum up, to be activated, social norms invoke the very mechanism of reciprocity.

Experiments also demonstrate that the effectiveness of normative messages, promoting the respect of social distancing or masking, is influenced by the level of trust individuals have in scientists (Bicchieri et al., 2021). In the United States, individuals with high levels of trust in sciences will likely be positively affected by messages promoting COVID-19 prevention measures (Bicchieri et al., 2021).

*H3: We hypothesize that when people believe that most of the population in the country where they live will be vaccinated, they are more likely to adopt a pro-vaccination attitude.*

To complete this approach, which considers social norms at a national level, we analyze the effect of the entourage, i.e., the people who are defined as close. We consider that norms and precisely the fact of being subject to expectations and potential sanctions are embodied by the very entourage. More specifically, we assume that the injunctive dimension of social norms will be more likely to be embodied by the entourage's attitude and expectations. We, therefore, analyze how beliefs about the attitudes adopted by people's entourage and their beliefs regarding their entourage's expectations concerning their attitudes may influence their willingness to be vaccinated.

*H4: We hypothesize that when people believe that individuals they are close to will be vaccinated, they are more likely to adopt a pro-vaccination attitude.*

*H5: We hypothesize that when people believe that individuals they are close to expect them to be vaccinated, they are more likely to adopt a pro-vaccination attitude.*

Lastly, emotions influence how individuals perceive risks and their attitudes toward the measures promoted by the government. The mechanisms are the following: anger simplifies cognitive processing, making people less attentive to new information, while fear makes individuals less willing to take risks (Marcus, 2000). In the COVID-19 context, declaring to be angry or afraid are the determinants of, respectively, reluctance and favor towards adopting preventative measures and vaccination (Vasilopoulos et al., 2023; Brouard et al., 2020). To better understand how emotions might influence attitudes toward vaccination, we distinguish the general emotional state generated by the pandemic, and how worried they feel about getting COVID-19 and its consequences. The general emotional state revealed by this survey is the result of a much broader experience than COVID-19 period, and therefore, it reveals an emotional state toward the actions taken by the government. To complete this dimension, we also analyze their level of concern about the virus. It impacts their perception of the risk associated with COVID-19. To distinguish emotion, to what can be called risk perception, we add questions to evaluate to what

extent they perceive that they can get the covid and to what extent they perceive they might develop severe forms (for question details cf appendix).

*H6: We hypothesize anger will likely decrease willingness to get vaccinated, while fear and worry can increase it.*

*H7: We hypothesize people are more likely to have a pro-vaccination attitude if they are worried.*

### **Data & Methods**

The data was collected online by Harris Interactive between mid-June and mid-July 2021 in the United Kingdom, Germany, and France. A vaccination campaign targeting at-risk individuals and medical staff had already been launched, and the general population vaccination campaign had already started. Quotas were used for the creation of the sample used for this survey. Their criteria were gender\*age (using five classes: 18-24, 25-34, 35-49, 50-64, and more than 65 years old) and the profession (using 24 standard categories called *PCS* in France).

Our analysis seeks to determine the factors influencing a pro-vaccination attitude or, on the contrary, an anti-vaccination attitude. To determine those attitudes, we use responses to the following question: *If you were able to get vaccinated for COVID-19 now, would you get vaccinated?* The answers proposed to this question were: i) *I have already been vaccinated*; ii) *Yes, certainly*; iii) *Yes, probably*; iv) *No, probably not*; v) *No, certainly not*; vi) *I do not know yet*.

*Table 1: Details regarding vaccination decision*

	<b>France</b>	<b>United Kingdom</b>	<b>Germany</b>	<b>Total</b>
No, certainly not	434	190	240	<b>864</b>
No, probably not	348	109	309	<b>766</b>
Yes, probably	436	260	705	<b>1,401</b>
Yes, certainly	371	430	378	<b>1,179</b>
I have already been vaccinated	2,203	2,939	2,216	<b>7,358</b>
I do not know yet	239	97	185	<b>521</b>
<b>Total</b>	<b>4,031</b>	<b>4,025</b>	<b>4,033</b>	<b>12,089</b>

Depending on their answers, respondents are identified as anti-vaccination (when they answered *No, probably not* & *No, certainly not*) or as pro-vaccination (when they answered *I have already been vaccinated* & *Yes, certainly* & *Yes, probably*). Both attitudes were transformed into dummy variables. As presented in Table 1, the percentage of people who have an anti-vaccination attitude is higher in France and lower in the UK. Questions are detailed in the appendix.



We use socio-demographic variables: age (using the five categories), gender, income categories, education level, social class, and rural location as control variables (cf details in the appendix). We also consider any risk factors, such as preexisting illness. We ask whether they had at least one of the following: “*Cardiovascular diseases, diabetes, hepatitis B, chronic obstructive pulmonary disease, chronic kidney diseases, mental health disorders, and cancer,*” and create a dummy variable. It equals one when it is the case. We also asked whether they already had COVID-19. Individuals also declare their attitude toward health risks: “*How willing are you to take risks... that may affect your health?*” On an eleven-point scale, zero means ‘*Unwilling to take risks,*’ and ten means ‘*Fully prepared to take risks*’. Individuals’ responses are recoded as “Declare not taking health risks” if they give a mark superior to 5.

In order to obtain the level of trust individuals place in different types of entities, they had to answer the following questions: “*Thinking about your current daily life, how much do you trust each of the following ?*” : “*Your fellow citizens*”, or “*Thinking about [(our) Country] now, how much do you trust each of the following ?*”: “*The current (Country) government*” and “*The (country) scientists*”. The proposed responses include seven modalities (from 1= *No trust at all* to 7= *Complete trust*). We reshape answers to create dummy variables considering that the entity is trusted if the response selected is superior to 4. All the other questions are detailed in the appendix.

## **Method**

We have set up different logit analyses to mobilize more restrictive notions of pro-vaccination and anti-vaccination. As the time of the survey corresponds to the launch of the first mass vaccinations, we consider that individuals who had already been vaccinated (*I have already been vaccinated*) deserve specific attention. Therefore, we also analyze them separately. Afterward, we excluded those who had already been vaccinated to analyze again the factors that influence the pro- and anti-vaccination attitudes of those who have not been vaccinated. Lastly, add analysis in which we exclude those who answered “*I do not know yet*” to analyze the anti-vaccination determinants compared to pro-vaccination.

We use a logic regression to analyze pro-vaccination as well as anti-vaccination attitudes. The equation is the following:

$$Y_{ic} = \beta_0 + \beta_1 X_i + \beta_2 T_i + \beta_3 F_i + \beta_4 N_i + \beta_5 E_i + FE_c + \varepsilon_{ic}$$

Where  $Y_{ic}$  is the pro-vaccination or anti-vaccination attitude for individual  $i$  in country  $c$ ,  $X_i$  captures the socio-demographic factors that are used as a control,  $T_i$  is the vector of trust,  $F_i$  reflects ideology and sensitivity in fake news,  $N_i$  captures individual norm,  $E_i$  reflects emotional state and risk perception,  $FE_c$  is country fixed effects, and  $\varepsilon_{ic}$  is the random error term.

## **Results:**

We will first briefly present the dimensions deemed determinant in explaining the compliance of protective measures against COVID-19. We will expose how our results confirm or refute those of other authors. Then, we will present the main contribution of this paper, the effect of social norms.

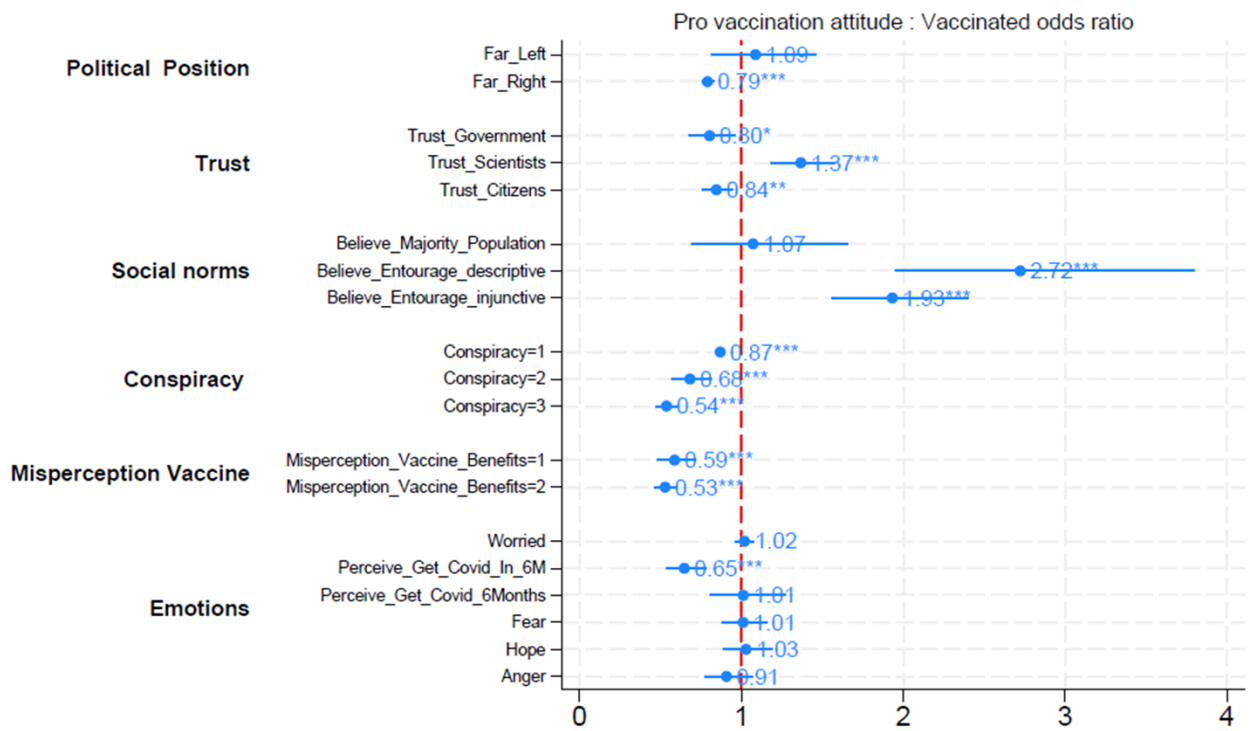
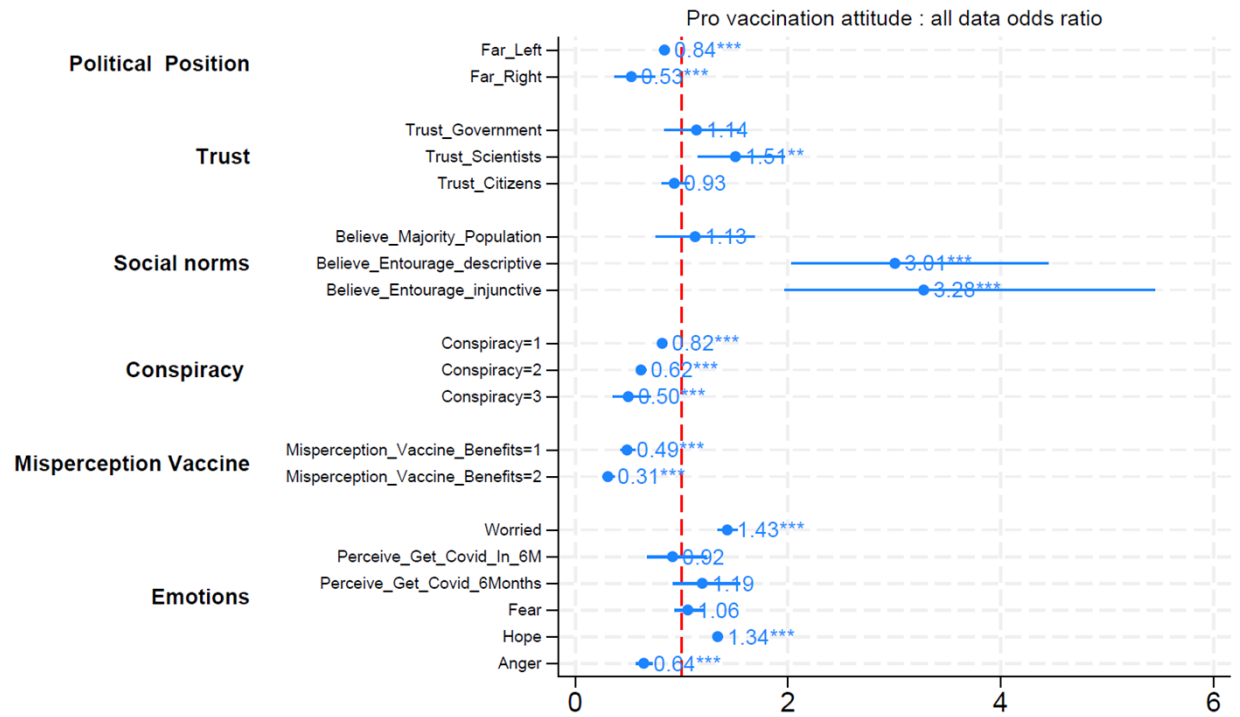
- **Result 1:** Trust in scientists strongly influences the willingness to get vaccinated.

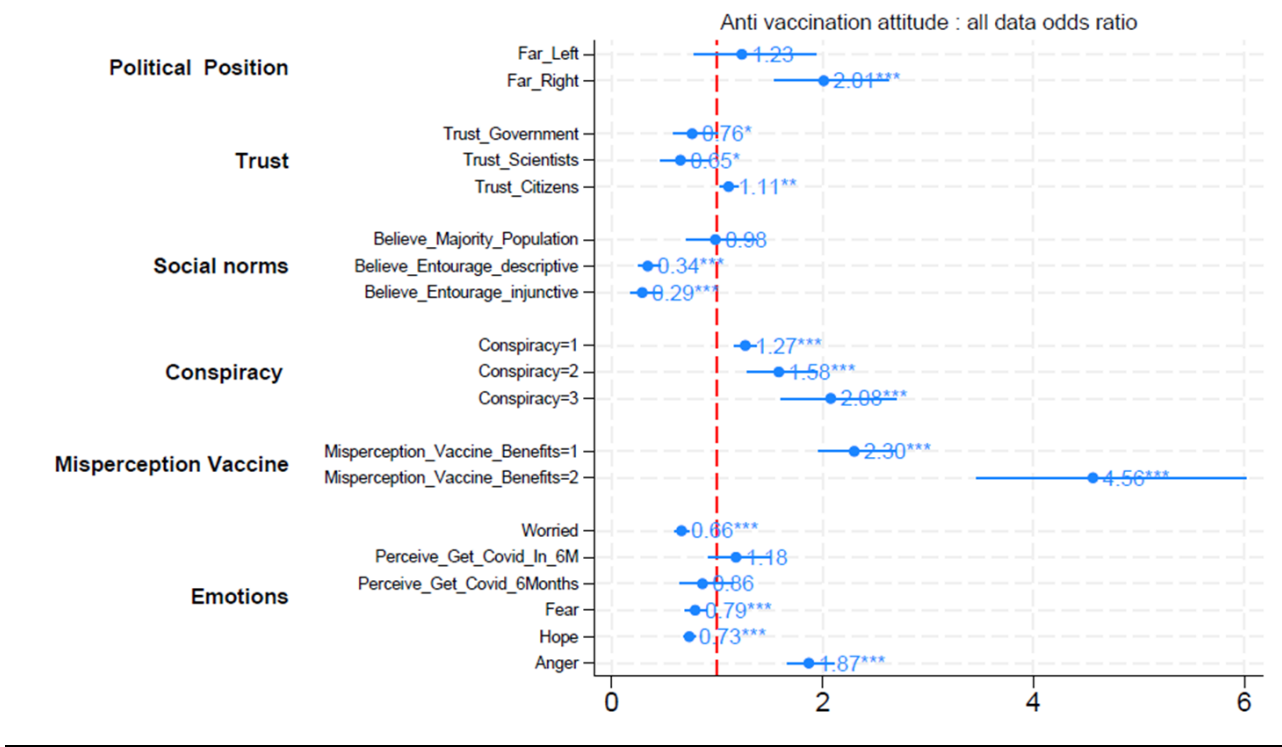
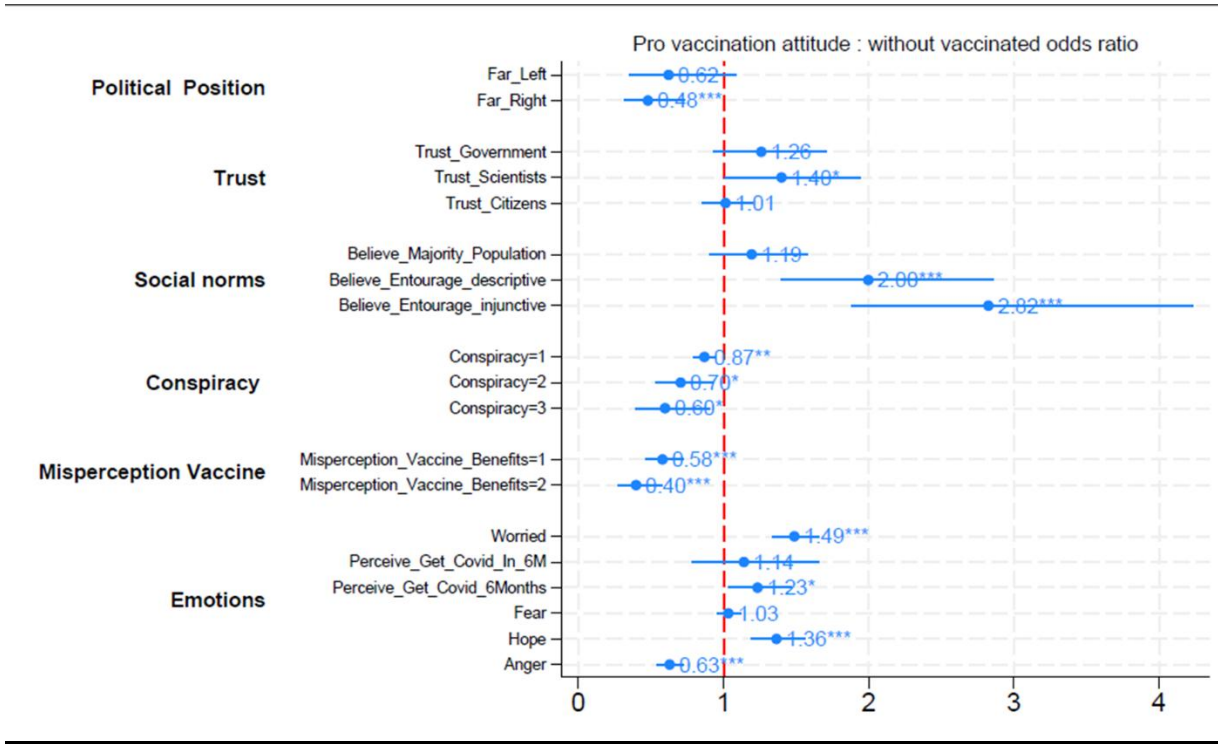
The three trust dimensions we assess have little correlation (0.41 between scientists and government, 0.27 between scientists and citizens, and 0.31 between government and citizens). This pattern is quite similar in the three countries, except for the relation between trust in scientists and trust in government, which is relatively high in Germany (0.49) and relatively low in the United Kingdom (0.33). So, all these variables are assessing different dimensions of trust.

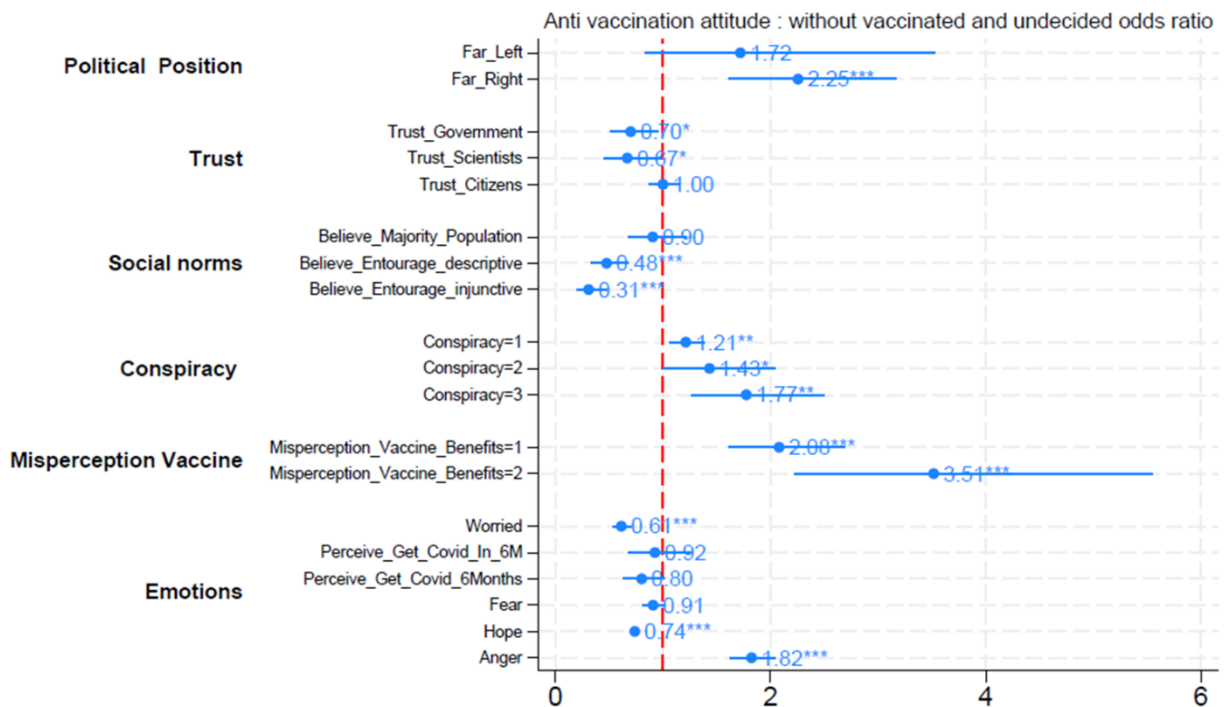
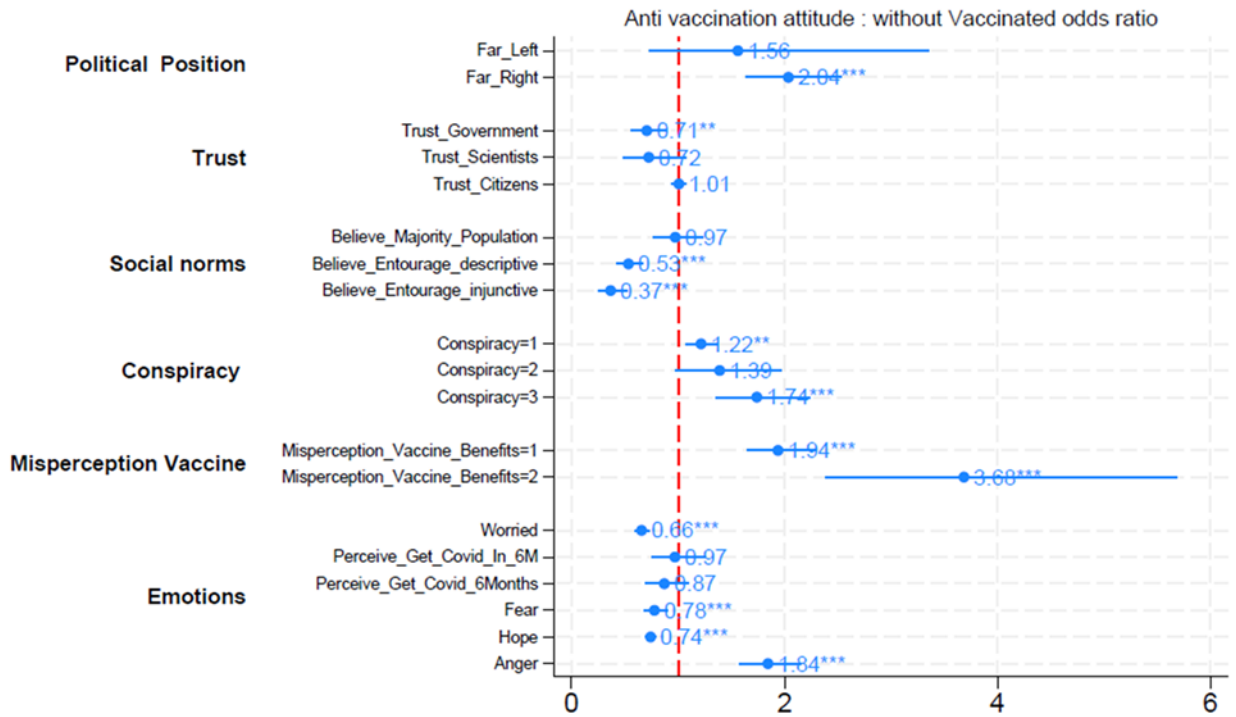
Trust in scientists is the trust dimension with the highest scores in the three countries. The percentage of the sample who declare to trust scientist is 53% in France, 68% in Germany, and 60% in the UK. Yet this dimension has a crucial effect on vaccination attitudes.

As the following figures show, individuals who trust scientists will likely have a pro-vaccination attitude (the marginal effect is 0.41 with  $P < 0.01$ ). A person who declares to trust scientists is 1.5 more likely to get vaccinated (cf Odds ratio in the appendix).

Not trusting the government is also significantly correlated with an anti-vaccination attitude (the marginal effect is -0.27 with  $P < 0.05$ ). A person who declares not trusting the government is 0.76 % less likely to be vaccinated. In contrast, trust in their fellow citizens does not lead to consistent results. We can only say that if there is an effect, it is the opposite of the one expected. Individuals who are already vaccinated seem to distrust their fellow citizens, while those with an anti-vaccination attitude seem trustier.







- **Result 2:** Ideology, precisely positioning oneself on the far right and being sensitive to conspiracy theory, is correlated to anti-vaccine attitudes.

All the dimensions we choose to characterize ideology and beliefs have low correlation rates (0.037 between conspiracy and far left, 0.067 between conspiracy and far right, 0.023 between misperception of vaccine benefits and far left, 0.075 between misperception of vaccine benefits and far right and 0.399 between conspiracy and misperception of vaccine benefits). All these factors are essential to understand what shapes their perceptions of the risks and benefits of vaccination. On average, around 30% of the sample consider one of the conspiracy statements as valid, and 7.5% consider these three statements as valid (with a higher percentage in France, 10.3%). Regarding misperception about the vaccine benefits, 25.6% consider one statement valid, and 6.8 % consider the two statements true. To self-identify as "very right" is a factor that favors an anti-vaccination attitude (the marginal effect is 0.689 if we consider all the data and 0.711 if we exclude those who are already vaccinated  $P < 0.01$ ). If they self-identify as far-right, they are two times more likely to have an anti-vaccination attitude. We do not observe concluding and robust results regarding the far-left positioning. This variable has no impact on being vaccinated or an apparent anti-vaccination attitude. Moreover, when people are sensitive to conspiracy theories, they are more likely to have an anti-vaccination attitude; between 1.2 times more likely when considering one of the statement valid and 2 times more likely when considering the three conspiracy statements valid (marginal effects are respectively 0.23 to 0.73;  $P < 0.01$ ). Lastly, misperceiving vaccines' benefits strongly affects anti-vaccination attitudes (the marginal effect, if they score one, is 0.83 and 1.52 if they score 2  $P < 0.01$ ). Depending on their misperception score of 1 or 2, they are 2.3 times to 4.5 times more likely to have an anti-vaccination attitude.

- **Result 3:** Anger correlates with an anti-vaccination attitude, while being worried is associated with a pro-vaccination attitude.

Regarding emotions, expressing fear about COVID-19 has a relatively modest correlation with being worried about COVID-19 (0.46); other emotional stages have poor correlation rates (cf appendix). Fear and Worry have a relatively low correlation with COVID-19 risk perception, i.e., to get COVID-19 in the six coming months and to develop severe COVID-19 (between 0.22 and 0.38 cf appendix).

Anger is positively correlated with anti-vaccine attitudes. When they express anger, people have 1.8 times more chance to have an anti-vaccination attitude (marginal effect 0.63,  $P < 0.01$ ). In contrast, fear, worry, and hope are negatively correlated with anti-vaccination attitudes (marginal effects are respectively -0.24, -0.41, -0.31,  $P < 0.01$ ). In other words, people with an anti-vaccination attitude do not consider that the situation their country has gone through generates fear or hope but anger. In comparison, pro-vaccination attitudes are negatively correlated with anger and positively correlated with hope (marginal effects -0.44 and +0.29,  $P < 0.01$ ). This is particularly true for people who are not vaccinated but intend to be vaccinated.

It must be highlighted that how they perceive the risk linked with COVID-19 and, more specifically, the risk of getting infected and developing a severe form does not affect vaccination attitude. Once again, it is only the emotion, being worried or not, that influences vaccination attitude, i.e., it positively correlates with pro-vaccination attitude and inversely.

Lastly, it is worth noticing that emotions have less influence on the people already vaccinated.

- **Result 4:** Social norms, and more precisely, what their entourage does and expects them to do, have a significant effect on their attitudes.

All these social norm variables have a relatively high correlation rate (0.61 between the belief regarding the majority of the population and entourage descriptive norm; 0.55 between the belief regarding the majority of the population and entourage injunctive norm; and 0.71 between entourage descriptive and injunctive). However, they are still capturing additional aspects. There are strong differences between countries regarding the percentage of the population that seem to share this norm. It particularly high in United Kingdom (around 80%) and relatively low in France (around 60%).

The anti-vaccinationists are more likely to disagree with the statements “*most people [they] care about will get vaccinated*” and “*most people [they] care about think [they] should get vaccinated*”. Respectively, we observe the reverse for the people who declare that they accept vaccination. They are more likely to consider that the people they care about will get vaccinated and expect them to be vaccinated. This dimension is one of the major determinants of vaccination attitude; when they agree with this social norm, they are 3 times more likely to adopt a pro-vaccination attitude (marginal effects 1.1 for the descriptive norm to 1.2;  $P < 0.01$  for the injunctive norm). On the contrary, when they do not, it increases the likelihood of adopting an anti-vaccination attitude to the same extent (marginal effects -1.0 for the descriptive norm to -1.2;  $P < 0.01$  for the injunctive norm).

It is worth noting that their beliefs about the attitude adopted by the vast majority of their country's population have no significant impacts on their attitude when adding dimensions reflecting injunctive norms are introduced. This result gives credit to the thesis that the entourage endorses the injunctive norm and is essential for understanding attitudes.

## **Discussion**

We will discuss the central insights of our results to understand how people evaluate risk and react to it.

Our results show that at the individual level, the decisive risk factors of developing severe COVID-19, such as being old or having pre-existing diseases, are significantly correlated with a pro-vaccination attitude. So, what can be called a rational way to evaluate a risk does play a role, but it is insufficient to understand attitudes.

We demonstrate that the emotions generated by a risky situation significantly influence attitudes. The fact of being angry makes people less likely to be vaccinated. On the contrary, worrying about a situation or declaring to have hope makes people more likely to have a pro-vaccination attitude. It is particularly interesting to note that their perceptions of the risk of getting infected and developing severe COVID-19 do not affect their attitude toward vaccination. In other words, it is not the perceptions of the probability of having COVID-19 or of developing severe forms of the disease that influence attitudes towards vaccination, but rather the emotions it generates. These results show how emotions participate in how we process and form a judgment based on the same information. Our results suggest that we should give credence to the adage: *“Beware of these two excesses: admitting only reason, excluding only reason. Welcome reason, but also accept the unforeseen, the unexpected, which at first may disturb you [...]”*. It is worth noting that this role of emotions is not observed in the individuals who decided to make an early vaccination choice, adding heterogeneity in these behavioral models.

Moreover, our results give us new elements regarding what may influence their perceptions. The fact that to declare not taking health risks has no consistent and significant effect on vaccination attitude is interesting because it brings us to question what is perceived as a risky action: the fact to get COVID-19 or the fact to be vaccinated?

Our results show that ideology strongly influences the answer to this question. When they declare to belong to the far right, they are less likely to accept vaccination. It is not surprising as many narratives of the Far-right were presenting vaccination as a risky action. We also show that the fact of being sensitive to conspiracy theories and to misperceive the vaccine benefit strongly influences anti-vaccination attitude. Additionally, we also add some insights regarding what can influence these beliefs. We show that trust in scientists is a determinant factor. There are reasons to believe that when people have an important level of trust in scientists, they are more likely to consider the narrative that describes vaccines against COVID-19 as the best and the only solution to end the pandemic as accurate. And so, to perceive vaccination as an action that has solid benefits for themselves and others.

Lastly, the main contribution of this work is that social norms play a significant role in the attitude toward vaccination. This norm is the behavior that individuals are likely to identify as desirable and beneficial to all when faced with a complex or even uncertain situation. The effect of the social norm is even more potent when first it has an injunctive dimension, and second when it is supported by those around us. Two



factors can explain this phenomenon. First, people we are close to are more likely to express disapproval when our behavior is not expected. Second, we are more likely to identify with people we are close to.

## **Conclusion**

With this work, we are adding evidence that if individual risk factors, like age or having diseases, are generally linked with a pro-vaccination attitude, other behavioral factors are also important determinants.

We confirm that ideology plays a significant role in attitude toward vaccination. More specifically, having a far-right political position is linked with an anti-vaccination attitude. We are adding dimensions to the analysis of the ideology effects by showing that the misperception of the vaccine benefits, the sensitivity to fake news, and conspiracy theories are essential drivers of anti-vaccination attitudes.

We corroborate the fact that emotions have a substantial impact on attitude. Individuals who experienced anger due to the COVID situation are more inclined to be against vaccination. On the contrary, individuals who have experimented with hope are more inclined to have a pro-vaccination attitude. We also demonstrate that being worried is a significant determinant of pro-vaccination attitude. To understand the crucial effect of this dimension, it must be put in perspective with the fact that perception of the risk of getting COVID-19 and of developing severe forms have no significant effects. These elements demonstrate that emotions play an essential role in risk perception. This work is also increasing the number of proofs demonstrating that trust, specifically trust in scientists, is an essential driver of vaccination acceptance.

Lastly, the major insight of this work is to show that social norms, and more precisely, the ones embedded by the very entourage, are a significant driver of attitude toward vaccination. When individuals believe that people they care about will get vaccinated and expect them to do the same, they are more inclined to be vaccinated. This work adds evidence that analyzing the perception of the risk presented by an event and the perception of the solutions to avoid it are crucial to understanding attitudes.

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# Appendix 1 Questionnaire details

## Description of the question relating to variables of interest

### *Trust*

In order to obtain the level of trust individuals place in different types of entities, they had to answer the following questions: “Thinking about your current daily life, how much do you trust each of the following ?” : “Your fellow citizens”, or “Thinking about [(our) Country] now, how much do you trust each of the following ?”: “The current (Country) government” and “The (country) scientists”. The proposed responses include seven modalities (from 1= No trust at all to 7= Complete trust). We reshape answers to create dummy variables considering that the entity is trusted if the response selected is superior to 4.

### *Ideology, sensitivity to fake news and misperception of vaccine’s benefits*

To establish political ideology, individuals position themselves on a right-left scale. To reflect extreme political positions, we create two dummy variables: Far left and far right. They are equal to one, respectively, if the answer selected equals 1 (very left) or 7 (very right) and 0 otherwise.

To measure individuals' sensitivity to fake news, they evaluate the veracity of different statements. They declare whether they consider each of them true or false, where 1= I am absolutely sure it is true, and 7=I am absolutely sure it is false. We create a dummy variable for each statement based on the marks they provide. It would equal one if their marks were superior to 4 when the statement was true or inferior to 4 when the statement was false. Otherwise, the variable is equal to 0.

To analyze their sensitivity to conspiracy theory, we ask them their opinion about the following statements:

- *The government is exaggerating the risks of Covid-19 to be able to restrict people’s rights and freedoms.*
- *Pharmaceutical companies are exempted from financial responsibility for adverse effects when they sell Covid-19 vaccines.*
- *Vaccines against Covid-19 contain aluminum, which has been proven to be harmful.*

We attribute them a score between 0 and 3, reflecting the number of conspiracy statements they believe to be true.

To analyze their misperception of the vaccine’s benefits, the following statements were presented:

- *Vaccination against Covid-19 is useless for a person in good health.*
- *Vaccination prevents the development of a severe form of a given disease, even if the one has contracted the virus.*

Each respondent has a score (between 0 and 2) reflecting his misperception of the vaccine’s benefits.

### *Social norm*

To evaluate their perception of the social norm, they declare how much they agree or disagree with the three following statements:

- *“Once it becomes possible, the vast majority of the population of [Country] will get vaccinated.”*
- *“Once it becomes possible, most people I care about will get vaccinated.”*

- *"Once it becomes possible, most people I care about think I should get vaccinated."*

The seven proposed response options were as follows: 1= *Strongly disagree*, 2 *Disagree*, 3 *Slightly disagree*, 4 *Neither agree nor disagree*, 5 *Slightly Agree*, 6 *Agree*, 7= *Strongly agree*. While the first question tends to elicit their beliefs about the current descriptive norm in their country, the second question determines their beliefs toward the current attitude of their entourage. This second question represents the descriptive norm of the group to which they belong. In comparison, the last question determines the expected attitude of their entourage. It is a question here of analyzing the injunctive dimension that vaccination has or not for individuals. For each of these questions, we consider that the individual shares a vaccination norm when the response provided is greater than 4.

### *Emotions and risk perception*

Regarding emotions, respondents were asked the following question: *"When you think about the situation regarding COVID-19 in the (Country), do you feel...? Fear? Hope? Anger?"*. They answer on a 7-point scale from 1 = *Not at all* to 7= *A lot*. We consider that the individual shares this specific emotion when their answer exceeds 4.

To evaluate their level of worry, we ask them: *"How worried are you personally about COVID-19 and its new variants?"* on a 7-point scale (1= not at all worried; 7= very worried). To evaluate how this emotion influences their attitude, we control by two questions that enable us to evaluate their perception of contracting COVID-19 and that if they get COVID-19, this will have severe consequences for their health. *"How much do you agree or disagree with the following statement? I will probably get Covid-19 or its variants in the next six months"*. Moreover, *"How much do you agree or disagree with the following statement? If I have Covid-19, it could have serious consequences for my health"*. We used a 7-point agree-disagree scale. We create a dummy if they choose a value superior to 4.

# Appendix 2 Socio-economic characteristics:

## Description of control variables categories

We used 5 **age categories**:

- 1- 18\_24
- 2- 25\_34
- 3- 35\_44
- 4- 45\_54
- 5- 55\_64
- 6- More than 65

To establish **education level**, we used the Isced questions and recode it into five categories:

- 1- Low Education include ISCED levels 0-2,
- 2- Medium Education include ISCED levels 3-4
- 3- High Education include ISCED levels 5-8

To establish **income categories**, we used question Q48: *Which of the following best describes the total monthly income of all the members of your household, including yourself, in January 2021 (total monthly income before taxes)?*

- 1- 750 euros or less
- 2- 751 to 1500 euros
- 3- 1501 to 2000 euros
- 4- 2001 to 3000 euros
- 5- 3001 to 4500 euros
- 6- 4501 to 6000 euros
- 7- 6001 to 8000 euros
- 8- 8001 or more

We **have recalculated income per tax unit**, taking into account the number of adults and children in the household (q47a and q47b). Children are considered as half a tax unit.

We reshape the following categories:

- 1 "Less than 500 per share"
- 2 "501 to 1000 per share"
- 3 "From 1000 to 1500 per share"
- 4 "From 1500 to 2000 per share"
- 5 "From 2000 to 2500 per share"
- 6 "More than 3000 per share".

**Social class** were rebuilt using the following question Q44 - *What is your occupation, (or your last occupation)? Choose the category that best describes your last work activity.*

- 1 - *Self-employed, managerial employees*
- 2- *Science, engineering and information and communications technology (ICT) professionals, health professionals, business and administration professionals, legal, social and cultural professionals, teaching professionals*



- 3- *Technicians and associated professionals, non-commissioned armed forces officers*
- 4- *Small entrepreneurs: skilled agricultural self-employed workers, technicians, clerical support, services and sales self-employed workers, craft and related trades self-employed workers*
- 5 - *Clerks and skilled service employees: general and numerical clerks and other clerical support employees, customer services clerks, personal care employees, armed force occupations and protective service employees*
- 6 - *Industrial skilled employees: Building and related trade employees, Food processing, wood working, garment employees, Metal, machinery, handicraft, printing, electrical and electronic trades employees, Stationary plant and machine operators and assemblers, Drivers*
- 7- *Personal services and sales employees, Blue collar employees and food preparation assistants in elementary occupations, Cleaners and helpers and services employees in elementary occupations, Agricultural employees*
- (8- *Retired persons and people out of the labour market aged 65 and over*)
- 9- *Other unemployed persons: students, homemaker, persons with permanent disabilities, etc.*

*We created four class where:*

- \*\* Upper class comprises categories 1, 2 and 3 to question 44
- \*\* Middle class comprises categories 4 and 5 to question 44
- \*\* Lower class comprises categories and 6 and 7 to question 44
- \*\* Unemployed equal to category 9 to question 44 "

Lastly, we consider that they live in a **rural area** if there are less than inhabitants, and in a urban one if there are more than 2000 inhabitants.

For the control the baseline categories are 18-24 years old, Women, < 500 euros per tax unit, Low education, Low Social Class and Urban.

Tables presenting socio-demographics characteristics of the sample and descriptives statistics on the variables of interest (mean and correlations)

Table 1: Socio-demographics characteristics of the sample.

		Country		
		France	United Kingdom	Germany
Age (%)	18-24	9,6	8,8	9,9
	25-34	12,7	14,2	14,0
	35-44	15,4	14,9	15,8
	45-54	17,8	19,4	18,1
	55-64	17,3	17,3	18,6
	65+	27,3	25,5	23,7
Gender (%)	Women	54,9	54,0	49,6
	Men	45,1	46,0	50,4
Education achieves (%)	Low Education include ISCED levels 0-2	6,7	4,3	55,2
	Medium Education include ISCED levels 3-4	42,3	45,4	15,9
	High Education include ISCED levels 5-8	51,0	50,3	28,9
Income categories by tax unit (%)	Less than 500 per share	5,8	7,6	2,5
	501 to 1000 per share	23,4	22,9	18,5
	From 1000 to 1500 per share	29,0	26,5	31,5
	From 1500 to 2000 per share	21,1	17,4	19,4
	From 2000 to 2500 per share	8,6	7,0	8,9
	More than 3000 per share	12,1	18,6	19,3
Social class (%)	Lower class	15,4	20,7	17,6
	Unemployed	12,5	15,4	17,6
	Middle class	28,5	29,4	21,2
	Upper class	43,6	34,5	43,6
Rural Urban (%)	Urban (2,000 or more)	82,1	89,2	90,2
	Rural (less than 2,000)	17,9	10,8	9,8

Table 2: Description of the variables of interest (in percentage).

		Country		
		France	United Kingdom	Germany
<b>Political orientation</b>	Far left	2,8	3,1	2,0
	Left	23,3	21,7	27,7
	Center	38,1	43,2	49,6
	Right	29,2	28,3	19,1
	Far right	6,6	3,7	1,6
<b>Conspiracy, number of statements they believe to be true</b>	0	40,3	54,1	44,5
	1	31,2	29,4	31,1
	2	18,2	11,9	16,9
	3	10,3	4,6	7,6
<b>Misperception of vaccine benefits (score of misperceptions)</b>	0	62,9	71,9	67,8
	1	30,2	23,0	23,7
	2	6,9	5,1	8,6
<b>Trust</b>	Scientists	53,2	68,0	59,9
	Government	25,9	31,8	34,9
	Citizens	26,9	40,5	32,7
<b>Social Norm</b>	Majority of the population	53,2	81,3	65,6
	Descriptive norm	65,0	83,2	73,0
	Injunctive norm	61,8	80,5	69,0
<b>Emotions</b>	Fear	34,5	37,4	31,7
	Hope	42,4	56,4	57,6
	Anger	46,8	46,2	39,8
	Worried	51,5	56,3	47,4
<b>Risk perception</b>	Get covid in 6 months	13,0	19,0	10,8
	Get severe covid	53,0	62,3	58,0

Tables Correlations between factors evaluating the same dimension within and across countries.

Table 3: Correlation between the factors evaluating ideology.

<b>Ideology</b>	Far Left - Conspiracy	Far Right – Conspiracy	Far Left - Misperception	Far Right – Misperception	Conspiracy – Misperception
All countries	0.0369	0.0673	0.0229	0.0755	0.3985
France	0.0618	0.0879	0.0322	0.0532	0.3677
Germany	0.0185	0.0228	0.0328	0.1006	0.4336
United Kingdom	0.0332	0.0573	0.0080	0.0914	0.3760

Table 4: Correlation between the factors evaluating trust.

<b>Trust dimension</b>	Trust scientists – Trust Government	Trust scientists- Trust citizens	Trust Government – Trust citizens
All countries	0.4127	0.2771	0.3134
France	0.4096	0.2437	0.2838
Germany	0.4867	0.2640	0.3270
United Kingdom	0.3335	0.2930	0.3194

Table 5: Correlation between the factors evaluating social norm.

<b>Social dimension</b>	<b>Norm</b>	Majority of pop - Entourage descriptive norm	Majority of pop - Entourage injunctive norm	Entourage descriptive norm – Entourage injunctive norm
All countries		0.6104	0.5505	0.7145
France		0.5751	0.5003	0.6950
Germany		0.5465	0.5028	0.7118
United Kingdom		0.7002	0.6276	0.7164

Table 6: Correlation between the factors evaluating emotions.

<b>Emotion dimension</b>	Fear – worried	Fear - Anger	Fear - Hope	Worried- Anger	Worried Hope	Anger - Hope
All countries	0.4595	0.3036	0.0358	0.1388	0.1190	-0.1265
France	0.4880	0.3354	0.0340	0.1892	0.0992	-0.0987
Germany	0.4288	0.2741	0.0704	0.0610	0.1961	-0.1504
United Kingdom	0.4559	0.2956	0.0069	0.1557	0.0666	-0.1186

Table 7: Correlation between the factors evaluating emotions and risk perception.

<b>Emotion and risk perception dimension</b>	Fear – Get covid	Fear-Get severe forms	Worried – Get covid	Worried – Get severe forms	Hope-Get Covid	Hope – Get severe forms	Anger – Get covid	Anger – Get severe forms
All countries	0.2226	0.2564	0.2150	0.3815	0.0546	0.1633	0.1339	0.0434
France	0.2181	0.2844	0.2135	0.3878	0.0605	0.1283	0.1305	0.0798
Germany	0.2399	0.2284	0.1925	0.3753	0.0466	0.2308	0.1347	-0.0222
United Kingdom	0.2063	0.2538	0.2225	0.3792	0.0520	0.1091	0.1289	0.0741

## Appendix 3: Models details

To test the robustness of the main factors analyzed, other models were tested.

In model 1, the variables assessing the conspiracy sensitivity, misperception of vaccine benefits, level of worry and risk perception were excluded.

Other models add variables compared to model 1.

Model 2 adds the variables on conspiracy and vaccine misperception.

Model 3 adds the variables assessing the level of worry and risk perception.

Model 4 adds both variables on conspiracy and vaccine benefits and the level of worry and risk perception.

Each model was tested with and without fixed effects and with and without control variables.

Table 8: Logit model on Pro-vaccination attitude (Model 1)

VARIABLES	(1) Provaccinatio n all data	(2) Provaccinatio n all data	(3) Provaccinatio n all data	(4) Vaccinate d	(5) Vaccinate d	(6) Vaccinate d	(7) Provaccinatio n without vaccinated	(8) Provaccinatio n without vaccinated	(9) Provaccinatio n without vaccinated
Declare not taking health risks	-0.242 (0.155)	-0.242*** (0.0631)	-0.182 (0.150)	0.279*** (0.0777)	0.279*** (0.0486)	0.555*** (0.168)	-0.419** (0.197)	-0.419*** (0.0752)	-0.521*** (0.187)
Preexisting diseases	0.368*** (0.0470)	0.368*** (0.0768)	0.483*** (0.0747)	0.235*** (0.0541)	0.235*** (0.0564)	0.466*** (0.0623)	0.279*** (0.0544)	0.279*** (0.0949)	0.253*** (0.0129)
Had covid	-0.0109 (0.0215)	-0.0109 (0.0802)	-0.0671*** (0.0252)	-0.391*** (0.103)	-0.391*** (0.0635)	-0.645*** (0.124)	0.252*** (0.0691)	0.252*** (0.0921)	0.388*** (0.0796)
Far left	-0.280*** (0.0392)	-0.280* (0.167)	-0.316*** (0.0762)	0.0379 (0.154)	0.0379 (0.138)	-0.119 (0.121)	-0.551* (0.298)	-0.551*** (0.213)	-0.529** (0.239)
Far right	-0.736*** (0.224)	-0.736*** (0.133)	-0.718*** (0.177)	-0.381*** (0.0221)	-0.381*** (0.113)	-0.362*** (0.0294)	-0.832*** (0.236)	-0.832*** (0.175)	-0.840*** (0.262)
Trust the Government	0.143 (0.157)	0.143 (0.0888)	0.101 (0.166)	-0.243** (0.104)	-0.243*** (0.0590)	-0.275*** (0.100)	0.265** (0.124)	0.265*** (0.101)	0.307** (0.128)
Trust the Scientists	0.580*** (0.182)	0.580*** (0.0700)	0.630*** (0.169)	0.412*** (0.0801)	0.412*** (0.0543)	0.409*** (0.0792)	0.477** (0.201)	0.477*** (0.0846)	0.505** (0.210)
Trust the Citizens	-0.153** (0.0746)	-0.153** (0.0726)	-0.101 (0.0741)	-0.245*** (0.0586)	-0.245*** (0.0526)	-0.189* (0.105)	-0.0338 (0.125)	-0.0338 (0.0874)	0.0135 (0.106)
Believe most people will get vaccinated (descriptive norm)	0.108 (0.215)	0.108 (0.0765)	0.101 (0.184)	0.0726 (0.231)	0.0726 (0.0609)	0.0968 (0.245)	0.165 (0.172)	0.165* (0.0911)	0.165 (0.184)
Believe entourage will get vaccinated (descriptive norm in group)	1.278*** (0.156)	1.278*** (0.0857)	1.337*** (0.179)	1.106*** (0.162)	1.106*** (0.0744)	1.182*** (0.154)	0.831*** (0.141)	0.831*** (0.101)	0.783*** (0.133)
Believe entourage would like him/her to get vaccinated (injunctive norm)	1.262***	1.262***	1.286***	0.694***	0.694***	0.726***	1.119***	1.119***	1.098***

	(0.276)	(0.0812)	(0.260)	(0.111)	(0.0677)	(0.0817)	(0.215)	(0.0954)	(0.206)
Fear	0.289***	0.289***	0.203*	-0.0401	-0.0401	-0.115	0.306***	0.306***	0.257**
	(0.0947)	(0.0688)	(0.114)	(0.0725)	(0.0510)	(0.0811)	(0.0891)	(0.0836)	(0.109)
Hope	0.351***	0.351***	0.403***	0.0494	0.0494	0.165*	0.387***	0.387***	0.391***
	(0.0260)	(0.0691)	(0.0153)	(0.0806)	(0.0521)	(0.0882)	(0.0591)	(0.0828)	(0.0622)
Anger	-0.579***	-0.579***	-0.549***	-0.200***	-0.200***	-0.188***	-0.564***	-0.564***	-0.559***
	(0.0889)	(0.0627)	(0.104)	(0.0701)	(0.0486)	(0.0481)	(0.117)	(0.0770)	(0.107)
Constant	-0.492***	-0.492***	-0.177***	-2.477***	-2.477***	-1.373***	-0.567***	-0.567***	-0.864***
	(0.0495)	(0.153)	(0.0678)	(0.378)	(0.136)	(0.0383)	(0.170)	(0.177)	(0.0938)
Observations	11,447	11,447	12,089	11,447	11,447	12,089	4,544	4,544	4,731
Country FE	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes
Control	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No
Pseudo R-squared	0.302	0.302	0.294	0.225	0.225	0.170	0.251	0.251	0.234

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1



Table 9: Logit model on Pro-vaccination attitude (Model 1 Odds Ratio)

VARIABLES	(1) Provaccination all data Odds ratio	(2) Provaccination all data Odds ratio	(3) Provaccination all data Odds ratio	(4) Vaccinated Odds ratio	(5) Vaccinated Odds ratio	(6) Vaccinated Odds ratio	(7) Provaccination without vaccinated Odds ratio	(8) Provaccination without vaccinated Odds ratio	(9) Provaccination without vaccinated Odds ratio
Declare not taking health risks	0.785 (0.122)	0.785*** (0.0495)	0.834 (0.125)	1.321*** (0.103)	1.321*** (0.0642)	1.743*** (0.293)	0.658** (0.129)	0.658*** (0.0495)	0.594*** (0.111)
Preexisting diseases	1.445*** (0.0678)	1.445*** (0.111)	1.621*** (0.121)	1.265*** (0.0684)	1.265*** (0.0713)	1.593*** (0.0992)	1.322*** (0.0719)	1.322*** (0.125)	1.288*** (0.0166)
Had covid	0.989 (0.0213)	0.989 (0.0793)	0.935*** (0.0235)	0.676*** (0.0696)	0.676*** (0.0429)	0.525*** (0.0653)	1.287*** (0.0889)	1.287*** (0.119)	1.474*** (0.117)
Far left	0.756*** (0.0296)	0.756* (0.127)	0.729*** (0.0556)	1.039 (0.160)	1.039 (0.143)	0.888 (0.107)	0.577* (0.172)	0.577*** (0.123)	0.589** (0.141)
Far right	0.479*** (0.107)	0.479*** (0.0639)	0.488*** (0.0864)	0.683*** (0.0151)	0.683*** (0.0775)	0.696*** (0.0204)	0.435*** (0.103)	0.435*** (0.0763)	0.432*** (0.113)
Trust the Government	1.154 (0.181)	1.154 (0.102)	1.106 (0.183)	0.784** (0.0812)	0.784*** (0.0463)	0.759*** (0.0760)	1.303** (0.161)	1.303*** (0.132)	1.360** (0.174)
Trust the Scientists	1.786*** (0.324)	1.786*** (0.125)	1.879*** (0.317)	1.509*** (0.121)	1.509*** (0.0819)	1.506*** (0.119)	1.612** (0.324)	1.612*** (0.136)	1.656** (0.348)
Trust the Citizens	0.858** (0.0640)	0.858** (0.0623)	0.904 (0.0669)	0.783*** (0.0459)	0.783*** (0.0412)	0.828* (0.0867)	0.967 (0.121)	0.967 (0.0845)	1.014 (0.107)
Believe most people will get vaccinated (descriptive norm)	1.114 (0.239)	1.114 (0.0852)	1.106 (0.204)	1.075 (0.249)	1.075 (0.0655)	1.102 (0.270)	1.180 (0.204)	1.180* (0.107)	1.179 (0.217)
Believe entourage will get vaccinated (descriptive norm in group)	3.591*** (0.560)	3.591*** (0.308)	3.808*** (0.683)	3.022*** (0.490)	3.022*** (0.225)	3.261*** (0.504)	2.296*** (0.324)	2.296*** (0.233)	2.188*** (0.291)

Believe entourage would like  
him/her to get vaccinated (injunctive  
norm)

	3.533*** (0.974)	3.533*** (0.287)	3.617*** (0.942)	2.002*** (0.223)	2.002*** (0.136)	2.066*** (0.169)	3.062*** (0.660)	3.062*** (0.292)	2.997*** (0.618)
Fear	1.335*** (0.126)	1.335*** (0.0918)	1.225* (0.140)	0.961 (0.0697)	0.961 (0.0490)	0.892 (0.0723)	1.358*** (0.121)	1.358*** (0.114)	1.294** (0.141)
Hope	1.421*** (0.0369)	1.421*** (0.0982)	1.496*** (0.0229)	1.051 (0.0847)	1.051 (0.0547)	1.179* (0.104)	1.473*** (0.0871)	1.473*** (0.122)	1.478*** (0.0919)
Anger	0.560*** (0.0498)	0.560*** (0.0351)	0.577*** (0.0600)	0.818*** (0.0574)	0.818*** (0.0398)	0.828*** (0.0398)	0.569*** (0.0664)	0.569*** (0.0438)	0.572*** (0.0611)
Constant	0.611*** (0.0302)	0.611*** (0.0933)	0.838*** (0.0568)	0.0840*** (0.0318)	0.0840*** (0.0114)	0.253*** (0.00971)	0.567*** (0.0962)	0.567*** (0.100)	0.422*** (0.0395)
Observations	11,447	11,447	12,089	11,447	11,447	12,089	4,544	4,544	4,731
Country FE	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes
Control	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No
Pseudo R-squared	0.302	0.302	0.294	0.225	0.225	0.170	0.251	0.251	0.234

Robust seeform in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table 10: Logit model on Anti-vaccination attitude (Model 1)

VARIABLES	(1) Anti-vaccination all data	(2) Anti-vaccination all data	(3) Anti-vaccination all data	(4) Anti-vaccination without vaccinated	(5) Anti-vaccination without vaccinated	(6) Anti-vaccination without vaccinated	(7) Anti-vaccination + without undecided	(8) Anti-vaccination + without undecided	(9) Anti-vaccination + without undecided
Declare not taking health risks	0.241 (0.167)	0.241*** (0.0683)	0.193 (0.153)	0.340* (0.182)	0.340*** (0.0762)	0.412** (0.167)	0.425** (0.208)	0.425*** (0.0836)	0.521*** (0.192)
Preexisting diseases	-0.255*** (0.0309)	-0.255*** (0.0840)	-0.344*** (0.0898)	-0.112 (0.0939)	-0.112 (0.0971)	-0.0952 (0.0746)	-0.199** (0.0836)	-0.199* (0.105)	-0.165** (0.0674)
Had covid	0.173*** (0.0309)	0.173** (0.0858)	0.225*** (0.0322)	0.00164 (0.0712)	0.00164 (0.0942)	-0.0969* (0.0588)	-0.153 (0.121)	-0.153 (0.101)	-0.289*** (0.0911)
Far left	0.343* (0.183)	0.343* (0.176)	0.311 (0.194)	0.552* (0.335)	0.552*** (0.207)	0.465 (0.414)	0.628* (0.335)	0.628*** (0.230)	0.570* (0.340)
Far right	0.793*** (0.192)	0.793*** (0.140)	0.804*** (0.139)	0.817*** (0.149)	0.817*** (0.169)	0.852*** (0.146)	0.928*** (0.239)	0.928*** (0.189)	0.953*** (0.259)
Trust the Government	-0.283** (0.140)	-0.283*** (0.104)	-0.212* (0.128)	-0.386*** (0.0902)	-0.386*** (0.113)	-0.397*** (0.0735)	-0.396*** (0.124)	-0.396*** (0.117)	-0.432*** (0.116)
Trust the Scientists	-0.620*** (0.227)	-0.620*** (0.0785)	-0.664*** (0.217)	-0.481** (0.232)	-0.481*** (0.0882)	-0.514** (0.247)	-0.564** (0.242)	-0.564*** (0.0940)	-0.591** (0.257)
Trust the Citizens	0.193*** (0.0333)	0.193** (0.0809)	0.154*** (0.0350)	0.0783 (0.0642)	0.0783 (0.0912)	0.0593 (0.0776)	0.0602 (0.101)	0.0602 (0.0982)	0.0319 (0.100)
Believe most people will get vaccinated (descriptive norm)	-0.00963 (0.191)	-0.00963 (0.0849)	-0.0225 (0.166)	-0.0272 (0.165)	-0.0272 (0.0943)	-0.0561 (0.177)	-0.0887 (0.204)	-0.0887 (0.103)	-0.112 (0.205)
Believe entourage will get vaccinated (descriptive norm in group)	-1.290*** (0.107)	-1.290*** (0.0969)	-1.330*** (0.146)	-0.787*** (0.0862)	-0.787*** (0.106)	-0.746*** (0.110)	-0.910*** (0.131)	-0.910*** (0.114)	-0.850*** (0.145)

Believe entourage would like him/her to get vaccinated (injunctive norm)	-1.320*** (0.263)	-1.320*** (0.0934)	-1.333*** (0.255)	-1.072*** (0.196)	-1.072*** (0.102)	-1.055*** (0.194)	-1.261*** (0.230)	-1.261*** (0.109)	-1.226*** (0.214)
Fear	-0.493*** (0.121)	-0.493*** (0.0772)	-0.414*** (0.135)	-0.524*** (0.143)	-0.524*** (0.0872)	-0.469*** (0.156)	-0.412*** (0.146)	-0.412*** (0.0947)	-0.362*** (0.162)
Hope	-0.362*** (0.0465)	-0.362*** (0.0777)	-0.411*** (0.0308)	-0.360*** (0.0197)	-0.360*** (0.0871)	-0.371*** (0.00101)	-0.400*** (0.00984)	-0.400*** (0.0931)	-0.408*** (0.0209)
Anger	0.794*** (0.107)	0.794*** (0.0688)	0.765*** (0.116)	0.759*** (0.126)	0.759*** (0.0783)	0.759*** (0.111)	0.732*** (0.104)	0.732*** (0.0854)	0.734*** (0.101)
Constant	-0.205*** (0.0387)	-0.205 (0.164)	-0.406*** (0.0668)	-0.235 (0.169)	-0.235 (0.179)	0.0776 (0.0663)	0.161 (0.181)	0.161 (0.197)	0.531*** (0.109)
Observations	11,447	11,447	12,089	4,544	4,544	4,731	4,040	4,040	4,210
Country FE	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes
Control	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No
Pseudo R-squared	0.303	0.303	0.297	0.228	0.228	0.218	0.290	0.290	0.273

Robust seeform in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table 11: Logit model  
Anti-vaccination attitude  
(Model 1 Odds Ratio)

VARIABLES	(1) Anti- vaccination all data Odds ratio	(2) Anti- vaccination all data Odds ratio	(3) Anti- vaccination all data Odds ratio	(4) Anti- vaccination without vaccinated Odds ratio	(5) Anti- vaccination without vaccinated Odds ratio	(6) Anti- vaccination without vaccinated Odds ratio	(7) Anti- vaccination + without undecided Odds ratio	(8) Anti- vaccination + without undecided Odds ratio	(9) Anti- vaccination + without undecided Odds ratio
Declare not taking health risks	1.272 (0.213)	1.272*** (0.0869)	1.213 (0.186)	1.404* (0.256)	1.404*** (0.107)	1.511** (0.252)	1.530** (0.319)	1.530*** (0.128)	1.684*** (0.324)
Preexisting diseases	0.775*** (0.0239)	0.775*** (0.0651)	0.709*** (0.0637)	0.894 (0.0839)	0.894 (0.0868)	0.909 (0.0678)	0.820** (0.0686)	0.820* (0.0860)	0.848** (0.0571)
Had covid	1.189*** (0.0368)	1.189** (0.102)	1.253*** (0.0403)	1.002 (0.0714)	1.002 (0.0943)	0.908* (0.0534)	0.859 (0.104)	0.859 (0.0870)	0.749*** (0.0683)
Far left	1.409* (0.258)	1.409* (0.248)	1.365 (0.265)	1.738* (0.583)	1.738*** (0.360)	1.591 (0.659)	1.874* (0.628)	1.874*** (0.431)	1.767* (0.600)
Far right	2.210*** (0.424)	2.210*** (0.310)	2.234*** (0.310)	2.265*** (0.337)	2.265*** (0.382)	2.345*** (0.343)	2.530*** (0.606)	2.530*** (0.478)	2.593*** (0.671)
Trust the Government	0.754** (0.105)	0.754*** (0.0787)	0.809* (0.104)	0.680*** (0.0613)	0.680*** (0.0765)	0.672*** (0.0494)	0.673*** (0.0835)	0.673*** (0.0789)	0.649*** (0.0750)
Trust the Scientists	0.538*** (0.122)	0.538*** (0.0422)	0.515*** (0.112)	0.618** (0.144)	0.618*** (0.0545)	0.598** (0.148)	0.569** (0.137)	0.569*** (0.0534)	0.554** (0.142)
Trust the Citizens	1.213*** (0.0404)	1.213** (0.0981)	1.167*** (0.0408)	1.081 (0.0694)	1.081 (0.0986)	1.061 (0.0823)	1.062 (0.108)	1.062 (0.104)	1.032 (0.103)
Believe most people will get vaccinated (descriptive norm)	0.990 (0.189)	0.990 (0.0841)	0.978 (0.162)	0.973 (0.161)	0.973 (0.0918)	0.945 (0.167)	0.915 (0.187)	0.915 (0.0940)	0.894 (0.184)
Believe entourage will get vaccinated (descriptive norm in group)	0.275*** (0.0296)	0.275*** (0.0267)	0.264*** (0.0387)	0.455*** (0.0393)	0.455*** (0.0483)	0.474*** (0.0520)	0.403*** (0.0529)	0.403*** (0.0459)	0.427*** (0.0621)

Believe entourage would like him/her to get vaccinated (injunctive norm)	0.267*** (0.0703)	0.267*** (0.0250)	0.264*** (0.0672)	0.342*** (0.0671)	0.342*** (0.0349)	0.348*** (0.0674)	0.283*** (0.0652)	0.283*** (0.0308)	0.293*** (0.0629)
Fear	0.611*** (0.0739)	0.611*** (0.0471)	0.661*** (0.0895)	0.592*** (0.0845)	0.592*** (0.0516)	0.625*** (0.0978)	0.662*** (0.0969)	0.662*** (0.0627)	0.696** (0.112)
Hope	0.696*** (0.0324)	0.696*** (0.0541)	0.663*** (0.0204)	0.698*** (0.0137)	0.698*** (0.0608)	0.690*** (0.000699)	0.670*** (0.00659)	0.670*** (0.0624)	0.665*** (0.0139)
Anger	2.213*** (0.236)	2.213*** (0.152)	2.150*** (0.250)	2.135*** (0.270)	2.135*** (0.167)	2.136*** (0.236)	2.078*** (0.217)	2.078*** (0.177)	2.084*** (0.211)
Constant	0.815*** (0.0315)	0.815 (0.134)	0.666*** (0.0445)	0.791 (0.133)	0.791 (0.142)	1.081 (0.0717)	1.175 (0.213)	1.175 (0.231)	1.700*** (0.185)
Observations	11,447	11,447	12,089	4,544	4,544	4,731	4,040	4,040	4,210
Country FE	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes
Control	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No
Pseudo R-squared	0.303	0.303	0.297	0.228	0.228	0.218	0.290	0.290	0.273

Robust seeform in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table 12: Logit model on Pro-  
vaccination attitude (Model 2)

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Provaccination all data	Provaccination all data	Provaccination all data	Vaccinated	Vaccinated	Vaccinated	Provaccination without vaccinated	Provaccination without vaccinated	Provaccination without vaccinated
Declare not taking health risks	-0.205 (0.168)	-0.205*** (0.0648)	-0.148 (0.162)	0.255*** (0.0682)	0.255*** (0.0494)	0.520*** (0.149)	-0.395* (0.212)	-0.395*** (0.0771)	-0.494** (0.196)
Preexisting diseases	0.359*** (0.0485)	0.359*** (0.0792)	0.482*** (0.0706)	0.227*** (0.0534)	0.227*** (0.0572)	0.458*** (0.0590)	0.275*** (0.0529)	0.275*** (0.0966)	0.264*** (0.0176)
Had covid	0.0796*** (0.0183)	0.0796 (0.0827)	0.0243* (0.0129)	-0.344*** (0.0992)	-0.344*** (0.0645)	-0.591*** (0.118)	0.321*** (0.0577)	0.321*** (0.0939)	0.450*** (0.0686)
Far left	-0.188*** (0.0373)	-0.188 (0.178)	-0.218** (0.0983)	0.0971 (0.147)	0.0971 (0.141)	-0.0515 (0.147)	-0.477 (0.308)	-0.477** (0.221)	-0.453* (0.246)
Far right	-0.628*** (0.184)	-0.628*** (0.137)	-0.606*** (0.137)	-0.262*** (0.0204)	-0.262** (0.116)	-0.231*** (0.0580)	-0.690*** (0.207)	-0.690*** (0.176)	-0.701*** (0.239)
Trust the Government	0.150 (0.145)	0.150* (0.0909)	0.110 (0.155)	-0.240** (0.0949)	-0.240*** (0.0599)	-0.252*** (0.0901)	0.271** (0.125)	0.271*** (0.103)	0.312** (0.126)
Trust the Scientists	0.452*** (0.155)	0.452*** (0.0721)	0.500*** (0.135)	0.313*** (0.0718)	0.313*** (0.0555)	0.320*** (0.0778)	0.380** (0.183)	0.380*** (0.0865)	0.399** (0.192)
Trust the Citizens	-0.0807 (0.0808)	-0.0807 (0.0747)	-0.0272 (0.0782)	-0.193*** (0.0567)	-0.193*** (0.0534)	-0.136 (0.102)	0.0150 (0.103)	0.0150 (0.0892)	0.0649 (0.0827)
Believe most people will get vaccinated (descriptive norm)	0.116 (0.207)	0.116 (0.0785)	0.112 (0.175)	0.0654 (0.227)	0.0654 (0.0619)	0.0913 (0.240)	0.170 (0.144)	0.170* (0.0927)	0.167 (0.152)
Believe entourage will get vaccinated (descriptive norm in group)	1.121*** (0.193)	1.121*** (0.0873)	1.180*** (0.215)	0.993*** (0.176)	0.993*** (0.0758)	1.070*** (0.174)	0.733*** (0.172)	0.733*** (0.103)	0.687*** (0.161)
Believe entourage would like him/her to get vaccinated (injunctive norm)	1.225*** (0.276)	1.225*** (0.0828)	1.243*** (0.250)	0.642*** (0.118)	0.642*** (0.0687)	0.676*** (0.0878)	1.087*** (0.217)	1.087*** (0.0968)	1.062*** (0.202)

Conspiracy(score=1)	-0.210*** (0.0243)	-0.210*** (0.0771)	-0.175*** (0.0283)	-0.131*** (0.00552)	-0.131** (0.0544)	-0.0216 (0.0259)	-0.167*** (0.0491)	-0.167* (0.0917)	-0.161*** (0.0609)
Conspiracy(score = 2)	-0.509*** (0.0520)	-0.509*** (0.0861)	-0.450*** (0.0773)	-0.381*** (0.0914)	-0.381*** (0.0699)	-0.228*** (0.0406)	-0.401** (0.163)	-0.401*** (0.104)	-0.410*** (0.150)
Conspiracy(score = 3)	-0.742*** (0.199)	-0.742*** (0.107)	-0.722*** (0.217)	-0.612*** (0.0701)	-0.612*** (0.0982)	-0.452*** (0.122)	-0.602*** (0.234)	-0.602*** (0.134)	-0.670*** (0.212)
Misperception of Vaccine Benefits (score=1)	-0.729*** (0.0784)	-0.729*** (0.0689)	-0.736*** (0.0677)	-0.565*** (0.0954)	-0.565*** (0.0542)	-0.657*** (0.130)	-0.539*** (0.134)	-0.539*** (0.0829)	-0.491*** (0.134)
Misperception of Vaccine Benefits (score=2)	-1.191*** (0.0938)	-1.191*** (0.107)	-1.185*** (0.107)	-0.657*** (0.0664)	-0.657*** (0.0961)	-0.746*** (0.0827)	-0.926*** (0.201)	-0.926*** (0.138)	-0.855*** (0.178)
Fear	0.249*** (0.0840)	0.249*** (0.0707)	0.164* (0.0974)	-0.0353 (0.0706)	-0.0353 (0.0519)	-0.0999 (0.0755)	0.264*** (0.0598)	0.264*** (0.0853)	0.213*** (0.0804)
Hope	0.310*** (0.0127)	0.310*** (0.0711)	0.364*** (0.0108)	0.0189 (0.0747)	0.0189 (0.0528)	0.137 (0.0861)	0.347*** (0.0691)	0.347*** (0.0845)	0.353*** (0.0643)
Anger	-0.433*** (0.0702)	-0.433*** (0.0649)	-0.412*** (0.0789)	-0.119 (0.0806)	-0.119** (0.0497)	-0.115* (0.0619)	-0.442*** (0.0888)	-0.442*** (0.0792)	-0.436*** (0.0808)
Constant	0.176*** (0.0481)	0.176 (0.163)	0.458*** (0.0773)	-2.002*** (0.333)	-2.002*** (0.140)	-0.933*** (0.0595)	-0.0550 (0.146)	-0.0550 (0.187)	-0.356*** (0.124)
Observations	11,447	11,447	12,089	11,447	11,447	12,089	4,544	4,544	4,731
Country FE	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes
Control	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No
Pseudo R-squared	0.336	0.336	0.327	0.243	0.243	0.190	0.273	0.273	0.256

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1



Table 13: Logit model on Pro-vaccination attitude (Model 2 Odds Ratio)

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Provaccination all data Odds ratio	Provaccination all data Odds ratio	Provaccination all data Odds ratio	Vaccinated Odds ratio	Vaccinated Odds ratio	Vaccinated Odds ratio	Provaccination without vaccinated Odds ratio	Provaccination without vaccinated Odds ratio	Provaccination without vaccinated Odds ratio
Declare not taking health risks	0.814 (0.137)	0.814*** (0.0528)	0.862 (0.139)	1.290*** (0.0880)	1.290*** (0.0638)	1.683*** (0.251)	0.674* (0.143)	0.674*** (0.0520)	0.610** (0.120)
Preexisting diseases	1.432*** (0.0694)	1.432*** (0.113)	1.619*** (0.114)	1.254*** (0.0669)	1.254*** (0.0718)	1.581*** (0.0933)	1.316*** (0.0697)	1.316*** (0.127)	1.302*** (0.0230)
Had covid	1.083*** (0.0198)	1.083 (0.0896)	1.025* (0.0132)	0.709*** (0.0704)	0.709*** (0.0457)	0.554*** (0.0654)	1.378*** (0.0796)	1.378*** (0.129)	1.568*** (0.108)
Far left	0.829*** (0.0309)	0.829 (0.148)	0.804** (0.0790)	1.102 (0.162)	1.102 (0.155)	0.950 (0.139)	0.621 (0.191)	0.621** (0.137)	0.636* (0.157)
Far right	0.534*** (0.0981)	0.534*** (0.0731)	0.545*** (0.0748)	0.769*** (0.0157)	0.769** (0.0895)	0.794*** (0.0460)	0.502*** (0.104)	0.502*** (0.0882)	0.496*** (0.119)
Trust the Government	1.162 (0.169)	1.162* (0.106)	1.116 (0.173)	0.786** (0.0747)	0.786*** (0.0471)	0.777*** (0.0701)	1.311** (0.163)	1.311*** (0.135)	1.366** (0.172)
Trust the Scientists	1.572*** (0.244)	1.572*** (0.113)	1.648*** (0.222)	1.368*** (0.0982)	1.368*** (0.0758)	1.377*** (0.107)	1.462** (0.268)	1.462*** (0.126)	1.491** (0.286)
Trust the Citizens	0.922 (0.0745)	0.922 (0.0689)	0.973 (0.0761)	0.824*** (0.0468)	0.824*** (0.0440)	0.873 (0.0890)	1.015 (0.104)	1.015 (0.0906)	1.067 (0.0883)
Believe most people will get vaccinated (descriptive norm)	1.123 (0.233)	1.123 (0.0882)	1.119 (0.196)	1.068 (0.242)	1.068 (0.0661)	1.096 (0.263)	1.186 (0.171)	1.186* (0.110)	1.182 (0.179)
Believe entourage will get vaccinated (descriptive norm in group)	3.068*** (0.591)	3.068*** (0.268)	3.254*** (0.700)	2.700*** (0.475)	2.700*** (0.205)	2.916*** (0.508)	2.080*** (0.358)	2.080*** (0.214)	1.987*** (0.320)

Believe entourage would like him/her to get vaccinated (injunctive norm)	3.405*** (0.939)	3.405*** (0.282)	3.464*** (0.868)	1.900*** (0.225)	1.900*** (0.130)	1.966*** (0.173)	2.965*** (0.643)	2.965*** (0.287)	2.892*** (0.585)
Conspiracy(score=1)	0.811*** (0.0197)	0.811*** (0.0625)	0.839*** (0.0237)	0.877*** (0.00484)	0.877** (0.0477)	0.979 (0.0254)	0.846*** (0.0416)	0.846* (0.0776)	0.852*** (0.0518)
Conspiracy(score = 2)	0.601*** (0.0313)	0.601*** (0.0517)	0.637*** (0.0493)	0.683*** (0.0624)	0.683*** (0.0478)	0.796*** (0.0323)	0.669** (0.109)	0.669*** (0.0696)	0.664*** (0.0996)
Conspiracy(score = 3)	0.476*** (0.0947)	0.476*** (0.0512)	0.486*** (0.105)	0.543*** (0.0380)	0.543*** (0.0533)	0.636*** (0.0778)	0.548*** (0.128)	0.548*** (0.0735)	0.512*** (0.109)
Misperception of Vaccine Benefits (score=1)	0.482*** (0.0378)	0.482*** (0.0332)	0.479*** (0.0324)	0.568*** (0.0542)	0.568*** (0.0308)	0.519*** (0.0674)	0.584*** (0.0784)	0.584*** (0.0484)	0.612*** (0.0818)
Misperception of Vaccine Benefits (score=2)	0.304*** (0.0285)	0.304*** (0.0326)	0.306*** (0.0328)	0.519*** (0.0344)	0.519*** (0.0499)	0.474*** (0.0392)	0.396*** (0.0798)	0.396*** (0.0548)	0.425*** (0.0756)
Fear	1.283*** (0.108)	1.283*** (0.0907)	1.178* (0.115)	0.965 (0.0681)	0.965 (0.0501)	0.905 (0.0683)	1.302*** (0.0778)	1.302*** (0.111)	1.238*** (0.0996)
Hope	1.364*** (0.0173)	1.364*** (0.0970)	1.439*** (0.0156)	1.019 (0.0761)	1.019 (0.0538)	1.147 (0.0988)	1.415*** (0.0978)	1.415*** (0.120)	1.424*** (0.0915)
Anger	0.649*** (0.0455)	0.649*** (0.0421)	0.663*** (0.0523)	0.888 (0.0716)	0.888** (0.0441)	0.891* (0.0552)	0.643*** (0.0571)	0.643*** (0.0509)	0.646*** (0.0522)
Constant	1.193*** (0.0574)	1.193 (0.194)	1.580*** (0.122)	0.135*** (0.0450)	0.135*** (0.0189)	0.393*** (0.0234)	0.946 (0.139)	0.946 (0.177)	0.701*** (0.0867)
Observations	11,447	11,447	12,089	11,447	11,447	12,089	4,544	4,544	4,731
Country FE	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes
Control	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No
Pseudo R-squared	0.336	0.336	0.327	0.243	0.243	0.190	0.273	0.273	0.256

Robust seeform in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table 14: Logit model on Anti-vaccination attitude (Model 2)

VARIABLES	(1) Anti- vaccination all data	(2) Anti- vaccination all data	(3) Anti- vaccination all data	(4) Anti- vaccination without vaccinated	(5) Anti- vaccination without vaccinated	(6) Anti- vaccination without vaccinated	(7) Anti- vaccination + without undecided	(8) Anti- vaccination + without undecided	(9) Anti- vaccination + without undecided
Declare not taking health risks	0.181 (0.177)	0.181** (0.0711)	0.133 (0.166)	0.295 (0.197)	0.295*** (0.0791)	0.357** (0.176)	0.400* (0.219)	0.400*** (0.0866)	0.488** (0.196)
Preexisting diseases	-0.235*** (0.0288)	-0.235*** (0.0876)	-0.336*** (0.0810)	-0.0960 (0.0966)	-0.0960 (0.1000)	-0.0978 (0.0786)	-0.187** (0.0843)	-0.187* (0.108)	-0.176** (0.0716)
Had covid	0.0822*** (0.0299)	0.0822 (0.0893)	0.136*** (0.0187)	-0.0675 (0.0617)	-0.0675 (0.0967)	-0.156*** (0.0569)	-0.229** (0.102)	-0.229** (0.104)	-0.357*** (0.0795)
Far left	0.225 (0.226)	0.225 (0.190)	0.188 (0.233)	0.448 (0.399)	0.448** (0.219)	0.357 (0.476)	0.538 (0.386)	0.538** (0.243)	0.472 (0.398)
Far right	0.688*** (0.139)	0.688*** (0.146)	0.699*** (0.0808)	0.673*** (0.101)	0.673*** (0.171)	0.714*** (0.0990)	0.758*** (0.165)	0.758*** (0.191)	0.786*** (0.193)
Trust the Government	-0.293** (0.126)	-0.293*** (0.108)	-0.218* (0.119)	-0.386*** (0.0900)	-0.386*** (0.115)	-0.397*** (0.0722)	-0.404*** (0.124)	-0.404*** (0.120)	-0.437*** (0.111)
Trust the Scientists	-0.475** (0.199)	-0.475*** (0.0816)	-0.513*** (0.182)	-0.366* (0.218)	-0.366*** (0.0910)	-0.388* (0.230)	-0.464** (0.224)	-0.464*** (0.0970)	-0.482** (0.239)
Trust the Citizens	0.119*** (0.0452)	0.119 (0.0840)	0.0735* (0.0420)	0.0179 (0.0496)	0.0179 (0.0941)	-0.00529 (0.0577)	0.00464 (0.0821)	0.00464 (0.101)	-0.0298 (0.0770)
Believe most people will get vaccinated (descriptive norm)	-0.0151 (0.173)	-0.0151 (0.0879)	-0.0389 (0.144)	-0.0256 (0.125)	-0.0256 (0.0969)	-0.0579 (0.132)	-0.0974 (0.159)	-0.0974 (0.106)	-0.122 (0.155)
Believe entourage will get vaccinated (descriptive norm in group)	-1.095*** (0.146)	-1.095*** (0.0990)	-1.135*** (0.184)	-0.659*** (0.109)	-0.659*** (0.108)	-0.623*** (0.131)	-0.771*** (0.168)	-0.771*** (0.116)	-0.711*** (0.179)
Believe entourage would like him/her to get vaccinated (injunctive norm)	-1.277***	-1.277***	-1.280***	-1.038***	-1.038***	-1.012***	-1.227***	-1.227***	-1.183***

	(0.252)	(0.0956)	(0.234)	(0.188)	(0.104)	(0.180)	(0.226)	(0.111)	(0.205)
Conspiracy(score=1)	0.248***	0.248***	0.218***	0.220***	0.220**	0.216**	0.229***	0.229**	0.222**
	(0.0414)	(0.0889)	(0.0464)	(0.0623)	(0.0984)	(0.0876)	(0.0666)	(0.105)	(0.0931)
Conspiracy(score = 2)	0.493***	0.493***	0.464***	0.377*	0.377***	0.413**	0.419**	0.419***	0.444**
	(0.118)	(0.0958)	(0.139)	(0.203)	(0.107)	(0.210)	(0.208)	(0.117)	(0.212)
Conspiracy(score = 3)	0.779***	0.779***	0.755***	0.625***	0.625***	0.678***	0.675***	0.675***	0.756***
	(0.157)	(0.114)	(0.160)	(0.163)	(0.130)	(0.149)	(0.209)	(0.145)	(0.193)
Misperception of Vaccine Benefits (score=1)	0.846***	0.846***	0.851***	0.666***	0.666***	0.632***	0.724***	0.724***	0.681***
	(0.0824)	(0.0764)	(0.0772)	(0.0960)	(0.0853)	(0.0992)	(0.150)	(0.0931)	(0.143)
Misperception of Vaccine Benefits (score=2)	1.530***	1.530***	1.522***	1.314***	1.314***	1.259***	1.259***	1.259***	1.182***
	(0.137)	(0.112)	(0.138)	(0.223)	(0.133)	(0.212)	(0.245)	(0.147)	(0.215)
Fear	-0.438***	-0.438***	-0.359***	-0.468***	-0.468***	-0.411***	-0.365***	-0.365***	-0.317***
	(0.102)	(0.0799)	(0.113)	(0.108)	(0.0897)	(0.118)	(0.103)	(0.0975)	(0.113)
Hope	-0.322***	-0.322***	-0.373***	-0.326***	-0.326***	-0.336***	-0.349***	-0.349***	-0.354***
	(0.0404)	(0.0807)	(0.0355)	(0.0320)	(0.0899)	(0.00767)	(0.0233)	(0.0959)	(0.0182)
Anger	0.621***	0.621***	0.599***	0.598***	0.598***	0.601***	0.582***	0.582***	0.587***
	(0.0738)	(0.0720)	(0.0791)	(0.0957)	(0.0813)	(0.0819)	(0.0769)	(0.0886)	(0.0757)
Constant	-1.012***	-1.012***	-1.173***	-0.879***	-0.879***	-0.568***	-0.549***	-0.549***	-0.155
	(0.0755)	(0.179)	(0.0871)	(0.190)	(0.194)	(0.0905)	(0.157)	(0.213)	(0.141)
Observations	11,447	11,447	12,089	4,544	4,544	4,731	4,040	4,040	4,210
Country FE	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes
Control	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No
Pseudo R-squared	0.350	0.350	0.344	0.265	0.265	0.255	0.324	0.324	0.308

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table 15: Logit model on Anti-vaccination attitude (Model 2 Odds ratio)

VARIABLES	(1) Anti-vaccination all data Odds ratio	(2) Anti-vaccination all data Odds ratio	(3) Anti-vaccination all data Odds ratio	(4) Anti-vaccination without vaccinated Odds ratio	(5) Anti-vaccination without vaccinated Odds ratio	(6) Anti-vaccination without vaccinated Odds ratio	(7) Anti-vaccination + without undecided Odds ratio	(8) Anti-vaccination + without undecided Odds ratio	(9) Anti-vaccination + without undecided Odds ratio
Declare not taking health risks	1.198 (0.212)	1.198** (0.0852)	1.142 (0.190)	1.343 (0.264)	1.343*** (0.106)	1.429** (0.252)	1.492* (0.327)	1.492*** (0.129)	1.629** (0.319)
Preexisting diseases	0.790*** (0.0228)	0.790*** (0.0692)	0.715*** (0.0579)	0.908 (0.0877)	0.908 (0.0908)	0.907 (0.0713)	0.829** (0.0699)	0.829* (0.0897)	0.838** (0.0600)
Had covid	1.086*** (0.0324)	1.086 (0.0969)	1.146*** (0.0214)	0.935 (0.0577)	0.935 (0.0904)	0.855*** (0.0487)	0.796** (0.0816)	0.796** (0.0829)	0.700*** (0.0556)
Far left	1.252 (0.283)	1.252 (0.238)	1.207 (0.282)	1.566 (0.625)	1.566** (0.343)	1.429 (0.681)	1.713 (0.662)	1.713** (0.417)	1.602 (0.637)
Far right	1.991*** (0.277)	1.991*** (0.290)	2.013*** (0.163)	1.960*** (0.198)	1.960*** (0.334)	2.042*** (0.202)	2.134*** (0.353)	2.134*** (0.407)	2.194*** (0.423)
Trust the Government	0.746** (0.0943)	0.746*** (0.0802)	0.804* (0.0954)	0.680*** (0.0612)	0.680*** (0.0783)	0.672*** (0.0486)	0.668*** (0.0831)	0.668*** (0.0803)	0.646*** (0.0717)
Trust the Scientists	0.622** (0.124)	0.622*** (0.0508)	0.599*** (0.109)	0.694* (0.151)	0.694*** (0.0631)	0.678* (0.156)	0.629** (0.141)	0.629*** (0.0610)	0.618** (0.147)
Trust the Citizens	1.126*** (0.0509)	1.126 (0.0946)	1.076* (0.0452)	1.018 (0.0505)	1.018 (0.0959)	0.995 (0.0574)	1.005 (0.0824)	1.005 (0.102)	0.971 (0.0748)
Believe most people will get vaccinated (descriptive norm)	0.985 (0.170)	0.985 (0.0866)	0.962 (0.138)	0.975 (0.122)	0.975 (0.0944)	0.944 (0.125)	0.907 (0.145)	0.907 (0.0957)	0.885 (0.137)
Believe entourage will get vaccinated (descriptive norm in group)	0.334*** (0.0489)	0.334*** (0.0331)	0.322*** (0.0591)	0.517*** (0.0566)	0.517*** (0.0560)	0.536*** (0.0701)	0.462*** (0.0778)	0.462*** (0.0538)	0.491*** (0.0882)

Believe entourage would like him/her to get vaccinated (injunctive norm)	0.279*** (0.0703)	0.279*** (0.0267)	0.278*** (0.0650)	0.354*** (0.0667)	0.354*** (0.0368)	0.364*** (0.0654)	0.293*** (0.0663)	0.293*** (0.0326)	0.306*** (0.0628)
Conspiracy(score=1)	1.281*** (0.0531)	1.281*** (0.114)	1.244*** (0.0577)	1.246*** (0.0776)	1.246** (0.123)	1.241** (0.109)	1.257*** (0.0837)	1.257** (0.132)	1.249** (0.116)
Conspiracy(score = 2)	1.638*** (0.194)	1.638*** (0.157)	1.590*** (0.221)	1.457* (0.295)	1.457*** (0.156)	1.511** (0.317)	1.521** (0.316)	1.521*** (0.177)	1.558** (0.331)
Conspiracy(score = 3)	2.179*** (0.343)	2.179*** (0.248)	2.128*** (0.341)	1.868*** (0.305)	1.868*** (0.243)	1.970*** (0.294)	1.965*** (0.411)	1.965*** (0.286)	2.130*** (0.411)
Misperception of Vaccine Benefits (score=1)	2.331*** (0.192)	2.331*** (0.178)	2.343*** (0.181)	1.946*** (0.187)	1.946*** (0.166)	1.881*** (0.187)	2.063*** (0.310)	2.063*** (0.192)	1.976*** (0.283)
Misperception of Vaccine Benefits (score=2)	4.620*** (0.632)	4.620*** (0.518)	4.581*** (0.634)	3.721*** (0.831)	3.721*** (0.494)	3.523*** (0.745)	3.521*** (0.864)	3.521*** (0.518)	3.260*** (0.701)
Fear	0.645*** (0.0657)	0.645*** (0.0516)	0.699*** (0.0787)	0.626*** (0.0675)	0.626*** (0.0562)	0.663*** (0.0782)	0.694*** (0.0716)	0.694*** (0.0677)	0.729*** (0.0823)
Hope	0.725*** (0.0293)	0.725*** (0.0585)	0.689*** (0.0245)	0.722*** (0.0231)	0.722*** (0.0649)	0.715*** (0.00548)	0.705*** (0.0164)	0.705*** (0.0676)	0.702*** (0.0128)
Anger	1.861*** (0.137)	1.861*** (0.134)	1.821*** (0.144)	1.818*** (0.174)	1.818*** (0.148)	1.823*** (0.149)	1.790*** (0.138)	1.790*** (0.159)	1.798*** (0.136)
Constant	0.364*** (0.0275)	0.364*** (0.0653)	0.309*** (0.0269)	0.415*** (0.0790)	0.415*** (0.0804)	0.567*** (0.0513)	0.578*** (0.0909)	0.578*** (0.123)	0.857 (0.121)
Observations	11,447	11,447	12,089	4,544	4,544	4,731	4,040	4,040	4,210
Country FE	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes
Control	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No
Pseudo R-squared	0.350	0.350	0.344	0.265	0.265	0.255	0.324	0.324	0.308

Robust seeform in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table 16: Logit model on Pro-vaccination attitude (Model 3)

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Provaccinatio n all data	Provaccinatio n all data	Provaccinatio n all data	Vaccinate d	Vaccinate d	Vaccinate d	Provaccinatio n without vaccinated	Provaccinatio n without vaccinated	Provaccinatio n without vaccinated
Declare not taking health risks	-0.274* (0.146)	-0.274*** (0.0638)	-0.234* (0.138)	0.219*** (0.0684)	0.219*** (0.0494)	0.429*** (0.144)	-0.432** (0.191)	-0.432*** (0.0764)	-0.515*** (0.176)
Preexisting diseases	0.306*** (0.0547)	0.306*** (0.0783)	0.410*** (0.0901)	0.237*** (0.0606)	0.237*** (0.0574)	0.418*** (0.0805)	0.213*** (0.0420)	0.213** (0.0967)	0.200*** (0.00764)
Had covid	-0.00541 (0.0318)	-0.00541 (0.0809)	-0.0397 (0.0360)	-0.335*** (0.120)	-0.335*** (0.0642)	-0.521*** (0.136)	0.236*** (0.0733)	0.236** (0.0934)	0.356*** (0.0758)
Far left	-0.266*** (0.0317)	-0.266 (0.169)	-0.308*** (0.0932)	0.0234 (0.153)	0.0234 (0.138)	-0.126 (0.124)	-0.548** (0.273)	-0.548** (0.215)	-0.522** (0.214)
Far right	-0.739*** (0.213)	-0.739*** (0.134)	-0.720*** (0.168)	-0.347*** (0.00692)	-0.347*** (0.114)	-0.295*** (0.0780)	-0.873*** (0.245)	-0.873*** (0.177)	-0.896*** (0.291)
Trust the Government	0.121 (0.167)	0.121 (0.0892)	0.0869 (0.179)	-0.219** (0.100)	-0.219*** (0.0594)	-0.230** (0.0975)	0.222 (0.158)	0.222** (0.102)	0.248 (0.167)
Trust the Scientists	0.521*** (0.156)	0.521*** (0.0708)	0.569*** (0.144)	0.401*** (0.0812)	0.401*** (0.0547)	0.390*** (0.0771)	0.415** (0.178)	0.415*** (0.0856)	0.448** (0.186)
Trust the Citizens	-0.134** (0.0654)	-0.134* (0.0731)	-0.0772 (0.0717)	-0.214*** (0.0606)	-0.214*** (0.0530)	-0.146 (0.104)	-0.0256 (0.103)	-0.0256 (0.0884)	0.0193 (0.0868)
Believe most people will get vaccinated (descriptive norm)	0.116 (0.213)	0.116 (0.0771)	0.112 (0.188)	0.0775 (0.226)	0.0775 (0.0611)	0.107 (0.241)	0.174 (0.170)	0.174* (0.0919)	0.176 (0.175)
Believe entourage will get vaccinated (descriptive norm in group)	1.246*** (0.167)	1.246*** (0.0863)	1.297*** (0.194)	1.107*** (0.156)	1.107*** (0.0748)	1.171*** (0.155)	0.781*** (0.151)	0.781*** (0.102)	0.730*** (0.152)
Believe entourage would like him/her to get vaccinated (injunctive norm)	1.218*** (0.258)	1.218*** (0.0821)	1.240*** (0.244)	0.706*** (0.102)	0.706*** (0.0683)	0.732*** (0.0751)	1.063*** (0.205)	1.063*** (0.0969)	1.043*** (0.192)

Worried	0.461*** (0.0445)	0.461*** (0.0726)	0.436*** (0.0701)	0.0761** * (0.0291)	0.0761 (0.0548)	0.0824* (0.0449)	0.483*** (0.0589)	0.483*** (0.0881)	0.458*** (0.104)
Perceive that they will get the Covid during the 6 coming months	-0.204 (0.141)	-0.204** (0.0949)	-0.287*** (0.0925)	-0.516*** (0.0859)	-0.516*** (0.0689)	-0.854*** (0.0438)	0.0344 (0.205)	0.0344 (0.107)	0.184 (0.208)
Perceive that they will get severe Covid	0.215 (0.147)	0.215*** (0.0685)	0.260** (0.129)	0.0358 (0.116)	0.0358 (0.0523)	0.182* (0.0957)	0.248** (0.103)	0.248*** (0.0843)	0.188 (0.117)
Fear	0.0503 (0.0626)	0.0503 (0.0767)	-0.0287 (0.0775)	-0.0143 (0.0695)	-0.0143 (0.0568)	-0.0754 (0.0843)	0.0365 (0.0528)	0.0365 (0.0923)	-0.0115 (0.0547)
Hope	0.334*** (0.0202)	0.334*** (0.0697)	0.383*** (0.0214)	0.0558 (0.0792)	0.0558 (0.0523)	0.154* (0.0908)	0.347*** (0.0617)	0.347*** (0.0838)	0.353*** (0.0589)
Anger	-0.579*** (0.0751)	-0.579*** (0.0631)	-0.548*** (0.0904)	-0.176** (0.0726)	-0.176*** (0.0489)	-0.147*** (0.0452)	-0.575*** (0.0996)	-0.575*** (0.0779)	-0.575*** (0.0891)
Constant	-0.580*** (0.0335)	-0.580*** (0.154)	-0.266*** (0.0512)	-2.449*** (0.373)	-2.449*** (0.137)	-1.360*** (0.0440)	-0.694*** (0.147)	-0.694*** (0.179)	-0.982*** (0.0698)
Observations	11,447	11,447	12,089	11,447	11,447	12,089	4,544	4,544	4,731
Country FE	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes
Control	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No
Pseudo R-squared	0.308	0.308	0.300	0.229	0.229	0.182	0.260	0.260	0.243

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1



Table 17: Logit model on Pro-vaccination attitude (Model 3 Odds ratio)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
VARIABLES	Provaccination all data Odds ratio	Provaccination all data Odds ratio	Provaccination all data Odds ratio	Vaccinated Odds ratio	Vaccinated Odds ratio	Vaccinated Odds ratio	Provaccination without vaccinated Odds ratio	Provaccination without vaccinated Odds ratio	Provaccination without vaccinated Odds ratio
Declare not taking health risks	0.760* (0.111)	0.760*** (0.0485)	0.791* (0.109)	1.245*** (0.0852)	1.245*** (0.0615)	1.535*** (0.221)	0.649** (0.124)	0.649*** (0.0496)	0.597*** (0.105)
Preexisting diseases	1.358*** (0.0743)	1.358*** (0.106)	1.506*** (0.136)	1.267*** (0.0768)	1.267*** (0.0727)	1.520*** (0.122)	1.238*** (0.0520)	1.238** (0.120)	1.221*** (0.00933)
Had covid	0.995 (0.0316)	0.995 (0.0805)	0.961 (0.0346)	0.715*** (0.0860)	0.715*** (0.0459)	0.594*** (0.0808)	1.267*** (0.0928)	1.267** (0.118)	1.428*** (0.108)
Far left	0.766*** (0.0243)	0.766 (0.130)	0.735*** (0.0684)	1.024 (0.156)	1.024 (0.141)	0.882 (0.110)	0.578** (0.158)	0.578** (0.125)	0.593** (0.127)
Far right	0.478*** (0.101)	0.478*** (0.0641)	0.487*** (0.0817)	0.707*** (0.00489)	0.707*** (0.0807)	0.744*** (0.0581)	0.418*** (0.102)	0.418*** (0.0740)	0.408*** (0.119)
Trust the Government	1.128 (0.188)	1.128 (0.101)	1.091 (0.195)	0.804** (0.0806)	0.804*** (0.0478)	0.795** (0.0775)	1.248 (0.197)	1.248** (0.128)	1.282 (0.214)
Trust the Scientists	1.684*** (0.263)	1.684*** (0.119)	1.766*** (0.254)	1.494*** (0.121)	1.494*** (0.0817)	1.477*** (0.114)	1.514** (0.269)	1.514*** (0.130)	1.566** (0.291)
Trust the Citizens	0.875** (0.0572)	0.875* (0.0640)	0.926 (0.0664)	0.807*** (0.0489)	0.807*** (0.0428)	0.864 (0.0895)	0.975 (0.100)	0.975 (0.0861)	1.019 (0.0885)
Believe most people will get vaccinated (descriptive norm)	1.123 (0.240)	1.123 (0.0865)	1.119 (0.210)	1.081 (0.245)	1.081 (0.0661)	1.113 (0.269)	1.190 (0.203)	1.190* (0.109)	1.193 (0.209)
Believe entourage will get vaccinated (descriptive norm in group)	3.478*** (0.582)	3.478*** (0.300)	3.658*** (0.710)	3.026*** (0.473)	3.026*** (0.226)	3.225*** (0.500)	2.183*** (0.329)	2.183*** (0.224)	2.076*** (0.316)

Believe entourage would like him/her to get vaccinated (injunctive norm)	3.381*** (0.872)	3.381*** (0.277)	3.454*** (0.842)	2.025*** (0.206)	2.025*** (0.138)	2.079*** (0.156)	2.896*** (0.594)	2.896*** (0.281)	2.838*** (0.545)
Worried	1.586*** (0.0706)	1.586*** (0.115)	1.547*** (0.108)	1.079*** (0.0314)	1.079 (0.0592)	1.086* (0.0487)	1.620*** (0.0955)	1.620*** (0.143)	1.582*** (0.165)
Perceive that they will get the Covid during the 6 coming months	0.816 (0.115)	0.816** (0.0774)	0.751*** (0.0695)	0.597*** (0.0513)	0.597*** (0.0411)	0.426*** (0.0186)	1.035 (0.213)	1.035 (0.111)	1.202 (0.250)
Perceive that they will get severe Covid	1.240 (0.183)	1.240*** (0.0849)	1.297** (0.167)	1.036 (0.120)	1.036 (0.0542)	1.199* (0.115)	1.282** (0.132)	1.282*** (0.108)	1.207 (0.141)
Fear	1.052 (0.0658)	1.052 (0.0807)	0.972 (0.0753)	0.986 (0.0685)	0.986 (0.0560)	0.927 (0.0782)	1.037 (0.0547)	1.037 (0.0957)	0.989 (0.0541)
Hope	1.396*** (0.0283)	1.396*** (0.0972)	1.467*** (0.0314)	1.057 (0.0838)	1.057 (0.0553)	1.166* (0.106)	1.415*** (0.0873)	1.415*** (0.119)	1.423*** (0.0838)
Anger	0.560*** (0.0421)	0.560*** (0.0354)	0.578*** (0.0522)	0.839** (0.0609)	0.839*** (0.0410)	0.863*** (0.0390)	0.563*** (0.0560)	0.563*** (0.0438)	0.563*** (0.0501)
Constant	0.560*** (0.0188)	0.560*** (0.0862)	0.766*** (0.0393)	0.0864** *	0.0864** *	0.257*** (0.0113)	0.499*** (0.0733)	0.499*** (0.0895)	0.375*** (0.0262)
Observations	11,447	11,447	12,089	11,447	11,447	12,089	4,544	4,544	4,731
Country FE	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes
Control	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No
Pseudo R-squared	0.308	0.308	0.300	0.229	0.229	0.182	0.260	0.260	0.243

Robust seeform in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table 18: Logit model on Anti-vaccination attitude (Model 3)

VARIABLES	(1) Anti- vaccination all data	(2) Anti- vaccination all data	(3) Anti- vaccination all data	(4) Anti- vaccination without vaccinated	(5) Anti- vaccination without vaccinated	(6) Anti- vaccination without vaccinated	(7) Anti- vaccination + without undecided	(8) Anti- vaccination + without undecided	(9) Anti- vaccination + without undecided
Declare not taking health risks	0.279* (0.154)	0.279*** (0.0691)	0.250* (0.138)	0.363** (0.170)	0.363*** (0.0772)	0.426*** (0.152)	0.450** (0.191)	0.450*** (0.0849)	0.531*** (0.173)
Preexisting diseases	-0.194*** (0.0638)	-0.194** (0.0859)	-0.271** (0.122)	-0.0586 (0.0931)	-0.0586 (0.0990)	-0.0479 (0.0888)	-0.135 (0.0825)	-0.135 (0.107)	-0.112 (0.0849)
Had covid	0.167*** (0.0294)	0.167* (0.0866)	0.197*** (0.0364)	0.0102 (0.0641)	0.0102 (0.0954)	-0.0783 (0.0553)	-0.140 (0.120)	-0.140 (0.103)	-0.263*** (0.100)
Far left	0.326* (0.184)	0.326* (0.179)	0.299 (0.201)	0.550* (0.327)	0.550*** (0.210)	0.461 (0.407)	0.631** (0.314)	0.631*** (0.235)	0.570* (0.322)
Far right	0.794*** (0.181)	0.794*** (0.141)	0.804*** (0.128)	0.849*** (0.156)	0.849*** (0.170)	0.894*** (0.168)	0.976*** (0.249)	0.976*** (0.191)	1.014*** (0.291)
Trust the Government	-0.255* (0.146)	-0.255** (0.105)	-0.192 (0.140)	-0.342*** (0.119)	-0.342*** (0.113)	-0.342*** (0.114)	-0.343** (0.162)	-0.343*** (0.119)	-0.363** (0.164)
Trust the Scientists	-0.556*** (0.198)	-0.556*** (0.0795)	-0.598*** (0.190)	-0.415** (0.204)	-0.415*** (0.0894)	-0.452** (0.220)	-0.482** (0.205)	-0.482*** (0.0955)	-0.516** (0.222)
Trust the Citizens	0.167*** (0.0291)	0.167** (0.0815)	0.124*** (0.0326)	0.0565 (0.0426)	0.0565 (0.0920)	0.0382 (0.0569)	0.0430 (0.0834)	0.0430 (0.0995)	0.0146 (0.0833)
Believe most people will get vaccinated (descriptive norm)	-0.0176 (0.189)	-0.0176 (0.0856)	-0.0355 (0.170)	-0.0314 (0.162)	-0.0314 (0.0951)	-0.0634 (0.171)	-0.0989 (0.194)	-0.0989 (0.104)	-0.125 (0.192)
Believe entourage will get vaccinated (descriptive norm in group)	-1.256*** (0.120)	-1.256*** (0.0975)	-1.287*** (0.162)	-0.740*** (0.0858)	-0.740*** (0.107)	-0.696*** (0.117)	-0.873*** (0.136)	-0.873*** (0.115)	-0.808*** (0.159)

Believe entourage would like him/her to get vaccinated (injunctive norm)	-1.274*** (0.241)	-1.274*** (0.0943)	-1.285*** (0.233)	-1.028*** (0.185)	-1.028*** (0.103)	-1.010*** (0.177)	-1.196*** (0.220)	-1.196*** (0.111)	-1.162*** (0.199)
Worried	-0.534*** (0.0671)	-0.534*** (0.0811)	-0.518*** (0.0872)	-0.523*** (0.0736)	-0.523*** (0.0920)	-0.502*** (0.105)	-0.585*** (0.0783)	-0.585*** (0.0990)	-0.560*** (0.124)
Perceive that they will get the Covid during the 6 coming months	0.291** (0.116)	0.291*** (0.106)	0.361*** (0.0773)	0.0835 (0.130)	0.0835 (0.115)	-0.0342 (0.140)	0.0323 (0.172)	0.0323 (0.120)	-0.118 (0.176)
Perceive that they will get severe Covid	-0.208 (0.163)	-0.208*** (0.0762)	-0.245* (0.145)	-0.198 (0.127)	-0.198** (0.0873)	-0.159 (0.123)	-0.276** (0.139)	-0.276*** (0.0938)	-0.217* (0.131)
Fear	-0.230*** (0.0803)	-0.230*** (0.0859)	-0.155* (0.0827)	-0.257** (0.103)	-0.257*** (0.0965)	-0.203** (0.0979)	-0.100 (0.0948)	-0.100 (0.105)	-0.0529 (0.0896)
Hope	-0.351*** (0.0348)	-0.351*** (0.0783)	-0.397*** (0.0208)	-0.330*** (0.0231)	-0.330*** (0.0881)	-0.339*** (0.00896)	-0.353*** (0.00736)	-0.353*** (0.0945)	-0.361*** (0.0124)
Anger	0.792*** (0.0906)	0.792*** (0.0693)	0.764*** (0.100)	0.761*** (0.108)	0.761*** (0.0791)	0.765*** (0.0934)	0.737*** (0.0856)	0.737*** (0.0865)	0.742*** (0.0820)
Constant	-0.121*** (0.0165)	-0.121 (0.166)	-0.318*** (0.0496)	-0.129 (0.152)	-0.129 (0.181)	0.176*** (0.0377)	0.310** (0.153)	0.310 (0.200)	0.666*** (0.0814)
Observations	11,447	11,447	12,089	4,544	4,544	4,731	4,040	4,040	4,210
Country FE	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes
Control	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No
Pseudo R-squared	0.310	0.310	0.305	0.237	0.237	0.226	0.301	0.301	0.284

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table 19: Logit model on Anti-vaccination attitude (Model 3 Odds Ratio)

VARIABLES	(1) Anti- vaccination all data Odds ratio	(2) Anti- vaccination all data Odds ratio	(3) Anti- vaccination all data Odds ratio	(4) Anti- vaccination without vaccinated Odds ratio	(5) Anti- vaccination without vaccinated Odds ratio	(6) Anti- vaccination without vaccinated Odds ratio	(7) Anti- vaccination + without undecided Odds ratio	(8) Anti- vaccination + without undecided Odds ratio	(9) Anti- vaccination + without undecided Odds ratio
Declare not taking health risks	1.322* (0.204)	1.322*** (0.0913)	1.284* (0.177)	1.437** (0.244)	1.437*** (0.111)	1.531*** (0.233)	1.568** (0.300)	1.568*** (0.133)	1.700*** (0.294)
Preexisting diseases	0.824*** (0.0526)	0.824** (0.0708)	0.763** (0.0930)	0.943 (0.0879)	0.943 (0.0934)	0.953 (0.0847)	0.874 (0.0721)	0.874 (0.0937)	0.894 (0.0759)
Had covid	1.181*** (0.0348)	1.181* (0.102)	1.218*** (0.0444)	1.010 (0.0647)	1.010 (0.0963)	0.925 (0.0511)	0.869 (0.105)	0.869 (0.0894)	0.769*** (0.0772)
Far left	1.385* (0.255)	1.385* (0.247)	1.348 (0.271)	1.732* (0.566)	1.732*** (0.365)	1.586 (0.646)	1.879** (0.591)	1.879*** (0.441)	1.769* (0.569)
Far right	2.212*** (0.400)	2.212*** (0.312)	2.236*** (0.286)	2.338*** (0.366)	2.338*** (0.398)	2.444*** (0.410)	2.654*** (0.661)	2.654*** (0.507)	2.757*** (0.803)
Trust the Government	0.775* (0.113)	0.775** (0.0814)	0.825 (0.116)	0.710*** (0.0848)	0.710*** (0.0806)	0.711*** (0.0809)	0.709** (0.115)	0.709*** (0.0842)	0.696** (0.114)
Trust the Scientists	0.574*** (0.113)	0.574*** (0.0456)	0.550*** (0.104)	0.660** (0.134)	0.660*** (0.0590)	0.636** (0.140)	0.617** (0.127)	0.617*** (0.0590)	0.597** (0.132)
Trust the Citizens	1.181*** (0.0344)	1.181** (0.0962)	1.132*** (0.0369)	1.058 (0.0450)	1.058 (0.0974)	1.039 (0.0591)	1.044 (0.0871)	1.044 (0.104)	1.015 (0.0846)
Believe most people will get vaccinated (descriptive norm)	0.983 (0.186)	0.983 (0.0841)	0.965 (0.164)	0.969 (0.157)	0.969 (0.0922)	0.939 (0.161)	0.906 (0.176)	0.906 (0.0941)	0.882 (0.170)
Believe entourage will get vaccinated (descriptive norm in group)	0.285*** (0.0342)	0.285*** (0.0278)	0.276*** (0.0448)	0.477*** (0.0410)	0.477*** (0.0512)	0.498*** (0.0581)	0.418*** (0.0569)	0.418*** (0.0483)	0.446*** (0.0708)

Believe entourage would like him/her to get vaccinated (injunctive norm)	0.280*** (0.0675)	0.280*** (0.0264)	0.277*** (0.0645)	0.358*** (0.0662)	0.358*** (0.0370)	0.364*** (0.0646)	0.302*** (0.0664)	0.302*** (0.0334)	0.313*** (0.0621)
Worried	0.586*** (0.0393)	0.586*** (0.0475)	0.596*** (0.0520)	0.593*** (0.0436)	0.593*** (0.0545)	0.605*** (0.0635)	0.557*** (0.0436)	0.557*** (0.0551)	0.571*** (0.0711)
Perceive that they will get the Covid during the 6 coming months	1.338** (0.155)	1.338*** (0.142)	1.434*** (0.111)	1.087 (0.141)	1.087 (0.125)	0.966 (0.135)	1.033 (0.178)	1.033 (0.124)	0.888 (0.157)
Perceive that they will get severe Covid	0.812 (0.132)	0.812*** (0.0619)	0.783* (0.114)	0.820 (0.104)	0.820** (0.0716)	0.853 (0.105)	0.759** (0.105)	0.759*** (0.0712)	0.805* (0.105)
Fear	0.795*** (0.0638)	0.795*** (0.0683)	0.857* (0.0708)	0.773** (0.0795)	0.773*** (0.0746)	0.816** (0.0799)	0.905 (0.0858)	0.905 (0.0946)	0.948 (0.0850)
Hope	0.704*** (0.0245)	0.704*** (0.0552)	0.672*** (0.0140)	0.719*** (0.0166)	0.719*** (0.0633)	0.712*** (0.00638)	0.703*** (0.00517)	0.703*** (0.0664)	0.697*** (0.00863)
Anger	2.208*** (0.200)	2.208*** (0.153)	2.147*** (0.215)	2.141*** (0.232)	2.141*** (0.169)	2.149*** (0.201)	2.089*** (0.179)	2.089*** (0.181)	2.100*** (0.172)
Constant	0.886*** (0.0147)	0.886 (0.147)	0.728*** (0.0361)	0.879 (0.134)	0.879 (0.159)	1.193*** (0.0449)	1.364** (0.209)	1.364 (0.272)	1.946*** (0.158)
Observations	11,447	11,447	12,089	4,544	4,544	4,731	4,040	4,040	4,210
Country FE	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes
Control	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No
Pseudo R-squared	0.310	0.310	0.305	0.237	0.237	0.226	0.301	0.301	0.284
Robust seeform in parentheses									
*** p<0.01, ** p<0.05, * p<0.1									

Table 20: Logit model on Pro-  
vaccination attitude (Model 4)

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Provaccination all data	Provaccination all data	Provaccination all data	Vaccinated	Vaccinated	Vaccinated	Provaccination without vaccinated	Provaccination without vaccinated	Provaccination without vaccinated
Declare not taking health risks	-0.228 (0.158)	-0.228*** (0.0655)	-0.189 (0.151)	0.209*** (0.0595)	0.209*** (0.0502)	0.414*** (0.129)	-0.402** (0.205)	-0.402*** (0.0782)	-0.482*** (0.185)
Preexisting diseases	0.309*** (0.0545)	0.309*** (0.0806)	0.421*** (0.0823)	0.235*** (0.0596)	0.235*** (0.0582)	0.421*** (0.0774)	0.217*** (0.0384)	0.217** (0.0982)	0.217*** (0.00456)
Had covid	0.0746** (0.0295)	0.0746 (0.0833)	0.0363 (0.0251)	-0.297** (0.116)	-0.297*** (0.0651)	-0.482*** (0.130)	0.294*** (0.0687)	0.294*** (0.0951)	0.407*** (0.0682)
Far left	-0.175*** (0.0283)	-0.175 (0.179)	-0.212* (0.116)	0.0828 (0.150)	0.0828 (0.141)	-0.0634 (0.149)	-0.476* (0.286)	-0.476** (0.224)	-0.449** (0.220)
Far right	-0.640*** (0.177)	-0.640*** (0.138)	-0.615*** (0.130)	-0.236*** (0.0241)	-0.236** (0.117)	-0.177* (0.101)	-0.737*** (0.214)	-0.737*** (0.178)	-0.760*** (0.263)
Trust the Government	0.131 (0.159)	0.131 (0.0912)	0.0972 (0.171)	-0.219** (0.0915)	-0.219*** (0.0603)	-0.215** (0.0885)	0.231 (0.157)	0.231** (0.104)	0.258 (0.162)
Trust the Scientists	0.410*** (0.136)	0.410*** (0.0728)	0.456*** (0.117)	0.312*** (0.0731)	0.312*** (0.0558)	0.309*** (0.0763)	0.336** (0.168)	0.336*** (0.0873)	0.361** (0.175)
Trust the Citizens	-0.0711 (0.0709)	-0.0711 (0.0751)	-0.0138 (0.0735)	-0.169*** (0.0578)	-0.169*** (0.0537)	-0.0999 (0.101)	0.0136 (0.0867)	0.0136 (0.0900)	0.0605 (0.0699)
Believe most people will get vaccinated (descriptive norm)	0.120 (0.205)	0.120 (0.0789)	0.120 (0.178)	0.0689 (0.222)	0.0689 (0.0620)	0.100 (0.237)	0.177 (0.142)	0.177* (0.0934)	0.176 (0.143)
Believe entourage will get vaccinated (descriptive norm in group)	1.101*** (0.200)	1.101*** (0.0879)	1.154*** (0.224)	1.001*** (0.170)	1.001*** (0.0761)	1.068*** (0.171)	0.691*** (0.183)	0.691*** (0.104)	0.644*** (0.182)
Believe entourage would like him/her to get vaccinated (injunctive norm)	1.187*** (0.259)	1.187*** (0.0835)	1.203*** (0.236)	0.658*** (0.110)	0.658*** (0.0692)	0.687*** (0.0818)	1.038*** (0.206)	1.038*** (0.0981)	1.012*** (0.189)

Conspiracy(score=1)	-0.202*** (0.0240)	-0.202*** (0.0774)	-0.174*** (0.0243)	-0.141*** (0.00196)	-0.141*** (0.0546)	-0.0512** (0.0227)	-0.142*** (0.0441)	-0.142 (0.0923)	-0.133** (0.0573)
Conspiracy(score=2)	-0.481*** (0.0383)	-0.481*** (0.0865)	-0.426*** (0.0603)	-0.384*** (0.0908)	-0.384*** (0.0701)	-0.240*** (0.0378)	-0.351** (0.140)	-0.351*** (0.105)	-0.357*** (0.120)
Conspiracy(score=3)	-0.696*** (0.180)	-0.696*** (0.108)	-0.682*** (0.199)	-0.623*** (0.0631)	-0.623*** (0.0985)	-0.475*** (0.112)	-0.517** (0.211)	-0.517*** (0.136)	-0.579*** (0.183)
Misperception of Vaccine Benefits (score=1)	-0.719*** (0.0722)	-0.719*** (0.0693)	-0.719*** (0.0647)	-0.534*** (0.101)	-0.534*** (0.0546)	-0.594*** (0.128)	-0.546*** (0.112)	-0.546*** (0.0839)	-0.511*** (0.109)
Misperception of Vaccine Benefits (score=2)	-1.182*** (0.0935)	-1.182*** (0.108)	-1.167*** (0.112)	-0.639*** (0.0678)	-0.639*** (0.0963)	-0.703*** (0.0750)	-0.924*** (0.189)	-0.924*** (0.140)	-0.868*** (0.161)
Worried	0.358*** (0.0326)	0.358*** (0.0746)	0.326*** (0.0622)	0.0183 (0.0280)	0.0183 (0.0555)	0.0325 (0.0431)	0.397*** (0.0553)	0.397*** (0.0897)	0.364*** (0.0977)
Perceive that they will get the Covid during the 6 coming months	-0.0885 (0.151)	-0.0885 (0.0970)	-0.174 (0.111)	-0.437*** (0.0993)	-0.437*** (0.0700)	-0.768*** (0.0466)	0.131 (0.191)	0.131 (0.109)	0.265 (0.199)
Perceive that they will get severe Covid	0.178 (0.134)	0.178** (0.0705)	0.229** (0.113)	0.0107 (0.118)	0.0107 (0.0531)	0.161* (0.0930)	0.210** (0.0886)	0.210** (0.0857)	0.162 (0.106)
Fear	0.0567 (0.0635)	0.0567 (0.0785)	-0.0187 (0.0731)	0.00944 (0.0682)	0.00944 (0.0576)	-0.0490 (0.0815)	0.0318 (0.0412)	0.0318 (0.0936)	-0.0133 (0.0454)
Hope	0.292*** (0.0118)	0.292*** (0.0716)	0.345*** (0.0162)	0.0271 (0.0744)	0.0271 (0.0530)	0.129 (0.0890)	0.310*** (0.0683)	0.310*** (0.0853)	0.319*** (0.0586)
Anger	-0.439*** (0.0615)	-0.439*** (0.0653)	-0.417*** (0.0702)	-0.0976 (0.0818)	-0.0976* (0.0499)	-0.0783 (0.0581)	-0.465*** (0.0735)	-0.465*** (0.0799)	-0.464*** (0.0657)
Constant	0.0797*** (0.0228)	0.0797 (0.164)	0.362*** (0.0542)	-1.979*** (0.327)	-1.979*** (0.141)	-0.928*** (0.0715)	-0.195 (0.124)	-0.195 (0.189)	-0.482*** (0.0990)
Observations	11,447	11,447	12,089	11,447	11,447	12,089	4,544	4,544	4,731
Country FE	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes
Control	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No
Pseudo R-squared	0.340	0.340	0.331	0.245	0.245	0.199	0.280	0.280	0.263

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1



Table 21: Logit model on Pro-vaccination attitude (Model 4 Odds Ratio)

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Provaccination all data Odds ratio	Provaccination all data Odds ratio	Provaccination all data Odds ratio	Vaccinated Odds ratio	Vaccinated Odds ratio	Vaccinated Odds ratio	Provaccination without vaccinated Odds ratio	Provaccination without vaccinated Odds ratio	Provaccination without vaccinated Odds ratio
Declare not taking health risks	0.796 (0.126)	0.796*** (0.0522)	0.828 (0.125)	1.232*** (0.0733)	1.232*** (0.0618)	1.513*** (0.195)	0.669** (0.137)	0.669*** (0.0523)	0.617*** (0.114)
Preexisting diseases	1.361*** (0.0741)	1.361*** (0.110)	1.524*** (0.125)	1.265*** (0.0754)	1.265*** (0.0736)	1.523*** (0.118)	1.243*** (0.0478)	1.243** (0.122)	1.242*** (0.00567)
Had covid	1.077** (0.0318)	1.077 (0.0898)	1.037 (0.0261)	0.743** (0.0862)	0.743*** (0.0484)	0.617*** (0.0802)	1.341*** (0.0922)	1.341*** (0.128)	1.502*** (0.102)
Far left	0.839*** (0.0237)	0.839 (0.151)	0.809* (0.0939)	1.086 (0.163)	1.086 (0.153)	0.939 (0.140)	0.621* (0.178)	0.621** (0.139)	0.638** (0.141)
Far right	0.528*** (0.0934)	0.528*** (0.0727)	0.541*** (0.0701)	0.790*** (0.0190)	0.790** (0.0923)	0.838* (0.0849)	0.479*** (0.102)	0.479*** (0.0850)	0.468*** (0.123)
Trust the Government	1.140 (0.181)	1.140 (0.104)	1.102 (0.188)	0.803** (0.0735)	0.803*** (0.0484)	0.807** (0.0714)	1.260 (0.197)	1.260** (0.131)	1.295 (0.210)
Trust the Scientists	1.507*** (0.205)	1.507*** (0.110)	1.577*** (0.185)	1.366*** (0.0998)	1.366*** (0.0762)	1.362*** (0.104)	1.399** (0.234)	1.399*** (0.122)	1.435** (0.251)
Trust the Citizens	0.931 (0.0660)	0.931 (0.0700)	0.986 (0.0725)	0.845*** (0.0488)	0.845*** (0.0454)	0.905 (0.0910)	1.014 (0.0879)	1.014 (0.0912)	1.062 (0.0743)
Believe most people will get vaccinated (descriptive norm)	1.127 (0.231)	1.127 (0.0890)	1.128 (0.201)	1.071 (0.238)	1.071 (0.0665)	1.105 (0.262)	1.193 (0.169)	1.193* (0.111)	1.193 (0.171)
Believe entourage will get vaccinated (descriptive norm in group)	3.006*** (0.602)	3.006*** (0.264)	3.172*** (0.710)	2.722*** (0.462)	2.722*** (0.207)	2.910*** (0.499)	1.997*** (0.366)	1.997*** (0.208)	1.904*** (0.347)

Believe entourage would like him/her to get vaccinated (injunctive norm)	3.277*** (0.850)	3.277*** (0.274)	3.329*** (0.786)	1.932*** (0.213)	1.932*** (0.134)	1.988*** (0.163)	2.824*** (0.582)	2.824*** (0.277)	2.752*** (0.520)
Conspiracy(score=1)	0.817*** (0.0196)	0.817*** (0.0633)	0.841*** (0.0204)	0.869*** (0.00170)	0.869*** (0.0474)	0.950** (0.0216)	0.868*** (0.0383)	0.868 (0.0801)	0.875** (0.0502)
Conspiracy(score=2)	0.618*** (0.0237)	0.618*** (0.0535)	0.653*** (0.0394)	0.681*** (0.0619)	0.681*** (0.0478)	0.787*** (0.0298)	0.704** (0.0984)	0.704*** (0.0739)	0.699*** (0.0842)
Conspiracy(score=3)	0.499*** (0.0899)	0.499*** (0.0540)	0.505*** (0.101)	0.536*** (0.0338)	0.536*** (0.0528)	0.622*** (0.0699)	0.596** (0.126)	0.596*** (0.0811)	0.560*** (0.103)
Misperception of Vaccine Benefits (score=1)	0.487*** (0.0352)	0.487*** (0.0338)	0.487*** (0.0316)	0.586*** (0.0590)	0.586*** (0.0320)	0.552*** (0.0708)	0.579*** (0.0647)	0.579*** (0.0486)	0.600*** (0.0651)
Misperception of Vaccine Benefits (score=2)	0.307*** (0.0287)	0.307*** (0.0332)	0.311*** (0.0349)	0.528*** (0.0358)	0.528*** (0.0509)	0.495*** (0.0371)	0.397*** (0.0752)	0.397*** (0.0556)	0.420*** (0.0677)
Worried	1.430*** (0.0466)	1.430*** (0.107)	1.386*** (0.0862)	1.019 (0.0285)	1.019 (0.0566)	1.033 (0.0446)	1.487*** (0.0823)	1.487*** (0.133)	1.439*** (0.141)
Perceive that they will get the Covid during the 6 coming months	0.915 (0.138)	0.915 (0.0888)	0.840 (0.0934)	0.646*** (0.0642)	0.646*** (0.0452)	0.464*** (0.0216)	1.140 (0.218)	1.140 (0.124)	1.304 (0.259)
Perceive that they will get severe Covid	1.194 (0.160)	1.194** (0.0842)	1.257** (0.142)	1.011 (0.119)	1.011 (0.0536)	1.174* (0.109)	1.234** (0.109)	1.234** (0.106)	1.176 (0.125)
Fear	1.058 (0.0672)	1.058 (0.0831)	0.981 (0.0718)	1.009 (0.0688)	1.009 (0.0581)	0.952 (0.0776)	1.032 (0.0426)	1.032 (0.0967)	0.987 (0.0448)
Hope	1.339*** (0.0159)	1.339*** (0.0958)	1.412*** (0.0229)	1.027 (0.0764)	1.027 (0.0545)	1.138 (0.101)	1.364*** (0.0931)	1.364*** (0.116)	1.375*** (0.0806)
Anger	0.644*** (0.0397)	0.644*** (0.0421)	0.659*** (0.0463)	0.907 (0.0742)	0.907* (0.0453)	0.925 (0.0537)	0.628*** (0.0462)	0.628*** (0.0502)	0.629*** (0.0413)
Constant	1.083*** (0.0247)	1.083 (0.178)	1.436*** (0.0778)	0.138*** (0.0452)	0.138*** (0.0195)	0.395*** (0.0283)	0.823 (0.102)	0.823 (0.156)	0.618*** (0.0611)
Observations	11,447	11,447	12,089	11,447	11,447	12,089	4,544	4,544	4,731
Country FE	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes
Control	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No
Pseudo R-squared	0.340	0.340	0.331	0.245	0.245	0.199	0.280	0.280	0.263

Robust seefoms in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table 22: logit model on Anti-vaccination attitude (Model 4)

VARIABLES	(1) Anti- vaccination all data	(2) Anti- vaccination all data	(3) Anti- vaccination all data	(4) Anti- vaccination without vaccinated	(5) Anti- vaccination without vaccinated	(6) Anti- vaccination without vaccinated	(7) Anti- vaccination + without undecided	(8) Anti- vaccination + without undecided	(9) Anti- vaccination + without undecided
Declare not taking health risks	0.209 (0.163)	0.209*** (0.0718)	0.177 (0.151)	0.309* (0.182)	0.309*** (0.0800)	0.362** (0.161)	0.417** (0.198)	0.417*** (0.0878)	0.491*** (0.174)
Preexisting diseases	-0.189*** (0.0592)	-0.189** (0.0891)	-0.279** (0.110)	-0.0541 (0.0892)	-0.0541 (0.102)	-0.0613 (0.0878)	-0.135* (0.0738)	-0.135 (0.110)	-0.134 (0.0817)
Had covid	0.0843*** (0.0265)	0.0843 (0.0900)	0.122*** (0.0231)	-0.0482 (0.0591)	-0.0482 (0.0978)	-0.127** (0.0536)	-0.204* (0.108)	-0.204* (0.106)	-0.319*** (0.0919)
Far left	0.210 (0.232)	0.210 (0.192)	0.177 (0.248)	0.446 (0.390)	0.446** (0.222)	0.355 (0.468)	0.542 (0.366)	0.542** (0.247)	0.474 (0.376)
Far right	0.698*** (0.135)	0.698*** (0.147)	0.707*** (0.0755)	0.711*** (0.110)	0.711*** (0.172)	0.759*** (0.119)	0.813*** (0.173)	0.813*** (0.193)	0.852*** (0.221)
Trust the Government	-0.272** (0.138)	-0.272** (0.108)	-0.206 (0.134)	-0.348*** (0.115)	-0.348*** (0.116)	-0.349*** (0.108)	-0.358** (0.159)	-0.358*** (0.121)	-0.378** (0.156)
Trust the Scientists	-0.430** (0.176)	-0.430*** (0.0824)	-0.466*** (0.162)	-0.322 (0.199)	-0.322*** (0.0919)	-0.348* (0.211)	-0.405** (0.197)	-0.405*** (0.0983)	-0.429** (0.212)
Trust the Citizens	0.103*** (0.0385)	0.103 (0.0845)	0.0543 (0.0375)	0.00816 (0.0343)	0.00816 (0.0948)	-0.0136 (0.0453)	-0.000784 (0.0707)	-0.000784 (0.102)	-0.0336 (0.0677)
Believe most people will get vaccinated (descriptive norm)	-0.0179 (0.169)	-0.0179 (0.0884)	-0.0469 (0.146)	-0.0263 (0.121)	-0.0263 (0.0975)	-0.0617 (0.126)	-0.100 (0.149)	-0.100 (0.106)	-0.129 (0.141)
Believe entourage will get vaccinated (descriptive norm in group)	-1.077*** (0.153)	-1.077*** (0.0996)	-1.111*** (0.192)	-0.626*** (0.117)	-0.626*** (0.109)	-0.588*** (0.145)	-0.744*** (0.178)	-0.744*** (0.118)	-0.679*** (0.199)
Believe entourage would like him/her to get vaccinated (injunctive norm)	-1.241***	-1.241***	-1.242***	-1.003***	-1.003***	-0.974***	-1.176***	-1.176***	-1.131***

	(0.233)	(0.0964)	(0.216)	(0.179)	(0.105)	(0.166)	(0.216)	(0.113)	(0.191)
Conspiracy(score=1)	0.236***	0.236***	0.212***	0.196***	0.196**	0.191**	0.192***	0.192*	0.186*
	(0.0426)	(0.0893)	(0.0444)	(0.0610)	(0.0989)	(0.0873)	(0.0679)	(0.106)	(0.0975)
Conspiracy(score=2)	0.460***	0.460***	0.433***	0.330*	0.330***	0.365**	0.359**	0.359***	0.382**
	(0.105)	(0.0963)	(0.122)	(0.178)	(0.108)	(0.182)	(0.181)	(0.118)	(0.180)
Conspiracy(score=3)	0.731***	0.731***	0.714***	0.554***	0.554***	0.603***	0.573***	0.573***	0.649***
	(0.133)	(0.114)	(0.138)	(0.129)	(0.131)	(0.107)	(0.175)	(0.147)	(0.146)
Misperception of Vaccine Benefits (score=1)	0.833***	0.833***	0.830***	0.662***	0.662***	0.636***	0.732***	0.732***	0.699***
	(0.0820)	(0.0769)	(0.0772)	(0.0836)	(0.0861)	(0.0801)	(0.130)	(0.0942)	(0.118)
Misperception of Vaccine Benefits (score=2)	1.518***	1.518***	1.500***	1.304***	1.304***	1.258***	1.257***	1.257***	1.191***
	(0.141)	(0.113)	(0.147)	(0.221)	(0.134)	(0.201)	(0.233)	(0.149)	(0.192)
Worried	-0.414***	-0.414***	-0.384***	-0.419***	-0.419***	-0.382***	-0.490***	-0.490***	-0.451***
	(0.0502)	(0.0841)	(0.0735)	(0.0494)	(0.0947)	(0.0883)	(0.0671)	(0.102)	(0.119)
Perceive that they will get the Covid during the 6 coming months	0.163	0.163	0.238**	-0.0296	-0.0296	-0.130	-0.0783	-0.0783	-0.212
	(0.127)	(0.109)	(0.0956)	(0.131)	(0.117)	(0.151)	(0.157)	(0.123)	(0.168)
Perceive that they will get severe Covid	-0.151	-0.151*	-0.197	-0.138	-0.138	-0.115	-0.221*	-0.221**	-0.173
	(0.148)	(0.0791)	(0.129)	(0.119)	(0.0896)	(0.117)	(0.121)	(0.0963)	(0.113)
Fear	-0.235***	-0.235***	-0.164**	-0.250***	-0.250**	-0.200***	-0.0971*	-0.0971	-0.0571
	(0.0674)	(0.0886)	(0.0655)	(0.0721)	(0.0988)	(0.0607)	(0.0576)	(0.107)	(0.0459)
Hope	-0.308***	-0.308***	-0.357***	-0.298***	-0.298***	-0.307***	-0.304***	-0.304***	-0.310***
	(0.0376)	(0.0812)	(0.0317)	(0.0363)	(0.0906)	(0.0174)	(0.0229)	(0.0971)	(0.0119)
Anger	0.625***	0.625***	0.604***	0.612***	0.612***	0.617***	0.600***	0.600***	0.607***
	(0.0603)	(0.0724)	(0.0683)	(0.0783)	(0.0820)	(0.0664)	(0.0580)	(0.0895)	(0.0575)
Constant	-0.917***	-0.917***	-1.076***	-0.760***	-0.760***	-0.459***	-0.378***	-0.378*	-0.00548
	(0.0646)	(0.181)	(0.0620)	(0.178)	(0.196)	(0.0537)	(0.131)	(0.216)	(0.107)
Observations	11,447	11,447	12,089	4,544	4,544	4,731	4,040	4,040	4,210
Country FE	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes
Control	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No
Pseudo R-squared	0.354	0.354	0.348	0.270	0.270	0.260	0.332	0.332	0.316

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table 23: Logit model on Anti-vaccination attitude (Model 4 Odds Ratio)

VARIABLES	(1) Anti-vaccination all data Odds ratio	(2) Anti-vaccination all data Odds ratio	(3) Anti-vaccination all data Odds ratio	(4) Anti-vaccination without vaccinated Odds ratio	(5) Anti-vaccination without vaccinated Odds ratio	(6) Anti-vaccination without vaccinated Odds ratio	(7) Anti-vaccination + without undecided Odds ratio	(8) Anti-vaccination + without undecided Odds ratio	(9) Anti-vaccination + without undecided Odds ratio
Declare not taking health risks	1.233 (0.201)	1.233*** (0.0885)	1.194 (0.181)	1.362* (0.247)	1.362*** (0.109)	1.436** (0.231)	1.517** (0.300)	1.517*** (0.133)	1.634*** (0.285)
Preexisting diseases	0.828*** (0.0490)	0.828** (0.0738)	0.756** (0.0833)	0.947 (0.0845)	0.947 (0.0962)	0.941 (0.0826)	0.874* (0.0645)	0.874 (0.0962)	0.875 (0.0715)
Had covid	1.088*** (0.0289)	1.088 (0.0979)	1.130*** (0.0260)	0.953 (0.0563)	0.953 (0.0932)	0.881** (0.0472)	0.816* (0.0885)	0.816* (0.0861)	0.727*** (0.0668)
Far left	1.233 (0.286)	1.233 (0.237)	1.194 (0.296)	1.562 (0.609)	1.562** (0.346)	1.426 (0.668)	1.719 (0.629)	1.719** (0.425)	1.607 (0.604)
Far right	2.010*** (0.272)	2.010*** (0.295)	2.028*** (0.153)	2.037*** (0.225)	2.037*** (0.350)	2.137*** (0.254)	2.255*** (0.391)	2.255*** (0.434)	2.345*** (0.517)
Trust the Government	0.762** (0.105)	0.762** (0.0822)	0.814 (0.109)	0.706*** (0.0810)	0.706*** (0.0819)	0.705*** (0.0759)	0.699** (0.111)	0.699*** (0.0848)	0.685** (0.107)
Trust the Scientists	0.651** (0.114)	0.651*** (0.0536)	0.628*** (0.102)	0.725 (0.144)	0.725*** (0.0666)	0.706* (0.149)	0.667** (0.131)	0.667*** (0.0656)	0.651** (0.138)
Trust the Citizens	1.108*** (0.0426)	1.108 (0.0936)	1.056 (0.0396)	1.008 (0.0345)	1.008 (0.0956)	0.987 (0.0447)	0.999 (0.0706)	0.999 (0.102)	0.967 (0.0654)
Believe most people will get vaccinated (descriptive norm)	0.982 (0.166)	0.982 (0.0869)	0.954 (0.139)	0.974 (0.117)	0.974 (0.0949)	0.940 (0.118)	0.904 (0.135)	0.904 (0.0963)	0.879 (0.124)
Believe entourage will get vaccinated (descriptive norm in group)	0.341*** (0.0521)	0.341*** (0.0339)	0.329*** (0.0633)	0.535*** (0.0624)	0.535*** (0.0584)	0.555*** (0.0803)	0.475*** (0.0848)	0.475*** (0.0559)	0.507*** (0.101)

Believe entourage would like him/her to get vaccinated (injunctive norm)	0.289*** (0.0675)	0.289*** (0.0279)	0.289*** (0.0624)	0.367*** (0.0656)	0.367*** (0.0386)	0.378*** (0.0628)	0.309*** (0.0665)	0.309*** (0.0348)	0.323*** (0.0615)
Conspiracy(score=1)	1.266*** (0.0539)	1.266*** (0.113)	1.237*** (0.0549)	1.216*** (0.0742)	1.216** (0.120)	1.211** (0.106)	1.212*** (0.0823)	1.212* (0.128)	1.204* (0.117)
Conspiracy(score=2)	1.584*** (0.166)	1.584*** (0.153)	1.542*** (0.188)	1.391* (0.247)	1.391*** (0.150)	1.440** (0.263)	1.432** (0.258)	1.432*** (0.169)	1.465** (0.264)
Conspiracy(score=3)	2.076*** (0.277)	2.076*** (0.238)	2.041*** (0.281)	1.740*** (0.224)	1.740*** (0.229)	1.827*** (0.196)	1.773*** (0.310)	1.773*** (0.261)	1.913*** (0.280)
Misperception of Vaccine Benefits (score=1)	2.299*** (0.189)	2.299*** (0.177)	2.293*** (0.177)	1.939*** (0.162)	1.939*** (0.167)	1.889*** (0.151)	2.079*** (0.271)	2.079*** (0.196)	2.011*** (0.238)
Misperception of Vaccine Benefits (score=2)	4.563*** (0.642)	4.563*** (0.516)	4.482*** (0.658)	3.685*** (0.813)	3.685*** (0.493)	3.519*** (0.706)	3.515*** (0.819)	3.515*** (0.524)	3.291*** (0.631)
Worried	0.661*** (0.0332)	0.661*** (0.0556)	0.681*** (0.0500)	0.658*** (0.0325)	0.658*** (0.0623)	0.682*** (0.0602)	0.612*** (0.0411)	0.612*** (0.0623)	0.637*** (0.0760)
Perceive that they will get the Covid during the 6 coming months	1.177 (0.150)	1.177 (0.128)	1.269** (0.121)	0.971 (0.127)	0.971 (0.113)	0.878 (0.133)	0.925 (0.145)	0.925 (0.114)	0.809 (0.136)
Perceive that they will get severe Covid	0.860 (0.128)	0.860* (0.0680)	0.821 (0.106)	0.871 (0.104)	0.871 (0.0781)	0.891 (0.104)	0.802* (0.0969)	0.802** (0.0772)	0.841 (0.0946)
Fear	0.791*** (0.0533)	0.791*** (0.0700)	0.849** (0.0556)	0.778*** (0.0561)	0.778** (0.0770)	0.819*** (0.0497)	0.907* (0.0523)	0.907 (0.0972)	0.944 (0.0433)
Hope	0.735*** (0.0276)	0.735*** (0.0597)	0.700*** (0.0222)	0.742*** (0.0270)	0.742*** (0.0672)	0.735*** (0.0128)	0.738*** (0.0169)	0.738*** (0.0716)	0.734*** (0.00873)
Anger	1.868*** (0.113)	1.868*** (0.135)	1.829*** (0.125)	1.844*** (0.144)	1.844*** (0.151)	1.853*** (0.123)	1.822*** (0.106)	1.822*** (0.163)	1.835*** (0.106)
Constant	0.400*** (0.0258)	0.400*** (0.0722)	0.341*** (0.0211)	0.468*** (0.0835)	0.468*** (0.0915)	0.632*** (0.0339)	0.685*** (0.0901)	0.685* (0.148)	0.995 (0.107)
Observations	11,447	11,447	12,089	4,544	4,544	4,731	4,040	4,040	4,210
Country FE	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes
Control	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No
Pseudo R-squared	0.354	0.354	0.348	0.270	0.270	0.260	0.332	0.332	0.316

Robust seeform in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1



Table 2: Determinants of Pro-vaccination Attitude

VARIABLES	(1)	-2	-3
	Provaccination all data	Vaccinated	Provaccination without vaccinated
Declare not taking health risks	-0.228 (0.158)	0.209*** (0.0595)	-0.402** (0.205)
Preexisting diseases	0.309*** (0.0545)	0.235*** (0.0596)	0.217*** (0.0384)
Had covid	0.0746** (0.0295)	-0.297** (0.116)	0.294*** (0.0687)
Far left	-0.175*** (0.0283)	0.0828 (0.150)	-0.476* (0.286)
Far right	-0.640*** (0.177)	-0.236*** (0.0241)	-0.737*** (0.214)
Trust the Government	0.131 (0.159)	-0.219** (0.0915)	0.231 (0.157)
Trust the Scientists	0.410*** (0.136)	0.312*** (0.0731)	0.336** (0.168)
Trust the Citizens	-0.0711 (0.0709)	-0.169*** (0.0578)	0.0136 (0.0867)
Believe most people will get vaccinated (descriptive norm)	0.120 (0.205)	0.0689 (0.222)	0.177 (0.142)
Believe entourage will get vaccinated (descriptive norm in group)	1.101*** (0.200)	1.001*** (0.170)	0.691*** (0.183)
Believe entourage would like him/her to get vaccinated (injunctive norm)	1.187*** (0.259)	0.658*** (0.110)	1.038*** (0.206)
Conspiracy(score=1)	-0.202*** (0.0240)	-0.141*** (0.00196)	-0.142*** (0.0441)



Conspiracy(score=2)	-0.481*** (0.0383)	-0.384*** (0.0908)	-0.351** (0.140)
Conspiracy(score=3)	-0.696*** (0.180)	-0.623*** (0.0631)	-0.517** (0.211)
Misperception of Vaccine Benefits (score=1)	-0.719*** (0.0722)	-0.534*** (0.101)	-0.546*** (0.112)
Misperception of Vaccine Benefits (score=2)	-1.182*** (0.0935)	-0.639*** (0.0678)	-0.924*** (0.189)
Worried	0.358*** (0.0326)	0.0183 (0.0280)	0.397*** (0.0553)
Perceive that they will get the Covid during the 6 coming months	-0.0885 (0.151)	-0.437*** (0.0993)	0.131 (0.191)
Perceive that they will get severe Covid	0.178 (0.134)	0.0107 (0.118)	0.210** (0.0886)
Fear	0.0567 (0.0635)	0.00944 (0.0682)	0.0318 (0.0412)
Hope	0.292*** (0.0118)	0.0271 (0.0744)	0.310*** (0.0683)
Anger	-0.439*** (0.0615)	-0.0976 (0.0818)	-0.465*** (0.0735)
Constant	0.0797*** (0.0228)	-1.979*** (0.327)	-0.195 (0.124)
Observations	11,447	11,447	4,544
Country FE	Yes	Yes	Yes
Control	Yes	Yes	Yes
Pseudo R-squared	0.340	0.245	0.280

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table 3: Determinants of Anti-vaccination Attitude

VARIABLES	(1) Anti- vaccination all data	-2 Anti- vaccination without vaccinated	-3 Anti- vaccination + without undecided
Declare not taking health risks	0.209 (0.163)	0.309* (0.182)	0.417** (0.198)
Preexisting diseases	-0.189*** (0.0592)	-0.0541 (0.0892)	-0.135* (0.0738)
Had covid	0.0843*** (0.0265)	-0.0482 (0.0591)	-0.204* (0.108)
Far left	0.210 (0.232)	0.446 (0.390)	0.542 (0.366)
Far right	0.698*** (0.135)	0.711*** (0.110)	0.813*** (0.173)
Trust the Government	-0.272** (0.138)	-0.348*** (0.115)	-0.358** (0.159)
Trust the Scientists	-0.430** (0.176)	-0.322 (0.199)	-0.405** (0.197)
Trust the Citizens	0.103*** (0.0385)	0.00816 (0.0343)	-0.000784 (0.0707)
Believe most people will get vaccinated (descriptive norm)	-0.0179 (0.169)	-0.0263 (0.121)	-0.100 (0.149)
Believe entourage will get vaccinated (descriptive norm in group)	-1.077*** (0.153)	-0.626*** (0.117)	-0.744*** (0.178)
Believe entourage would like him/her to get vaccinated (injunctive norm)	-1.241*** (0.233)	-1.003*** (0.179)	-1.176*** (0.216)
Conspiracy(score=1)	0.236*** (0.0426)	0.196*** (0.0610)	0.192*** (0.0679)

Conspiracy(score=2)	0.460*** (0.105)	0.330* (0.178)	0.359** (0.181)
Conspiracy(score=3)	0.731*** (0.133)	0.554*** (0.129)	0.573*** (0.175)
Misperception of Vaccine Benefits (score=1)	0.833*** (0.0820)	0.662*** (0.0836)	0.732*** (0.130)
Misperception of Vaccine Benefits (score=2)	1.518*** (0.141)	1.304*** (0.221)	1.257*** (0.233)
Worried	-0.414*** (0.0502)	-0.419*** (0.0494)	-0.490*** (0.0671)
Perceive that they will get the Covid during the 6 coming months	0.163 (0.127)	-0.0296 (0.131)	-0.0783 (0.157)
Perceive that they will get severe Covid	-0.151 (0.148)	-0.138 (0.119)	-0.221* (0.121)
Fear	-0.235*** (0.0674)	-0.250*** (0.0721)	-0.0971* (0.0576)
Hope	-0.308*** (0.0376)	-0.298*** (0.0363)	-0.304*** (0.0229)
Anger	0.625*** (0.0603)	0.612*** (0.0783)	0.600*** (0.0580)
Constant	-0.917*** (0.0646)	-0.760*** (0.178)	-0.378*** (0.131)
Observations	11,447	4,544	4,040
Country FE	Yes	Yes	Yes
Control	Yes	Yes	Yes
Pseudo R-squared	0.354	0.270	0.332

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1