Social worlds of attitudes towards anti-COVID-19 vaccination: a Multi-Sited Approach to contextualise a Society in Europe

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Research Article

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Abstract

What does the balance of attitudes towards the anti-COVID-19 vaccination look like in an eastern European Society? We compared what the Romanians in Romania, interviewed on the subject in the Flash Eurobarometer 494, say with what those from other European Union countries said. From the "discussion with the data" we understood that there are not only ani-vaxxers, pro-vaxxers, and hesitant. There are other categories that matter, between them. We tried to see how much it mattered, in the pro- or anti-vaccination beliefs, not only the usual demographic conditionings of education, age, gender, or residential environment, but also personal pre-pandemic vaccination experiences, as an adult, or trust in institutions relevant to the COVID-19 vaccination.

How is the typical Romanian compared to the typical European from the perspective of the main factors of conditioning the attitude towards the anti-COVID-19 vaccination?

Questions

Can we talk about groups of anti-vaccines or hesitants in COVID-19 vaccination in terms of "social worlds"? At first glance, the option would not be indicated, because the term social is, itself, a vague one. Yes, it is vague, one can say, but there are, in fact, social groups with diffuse borders, even within the same country, that seem to have specific cultures of rejecting or avoiding the COVID-19 vaccine. By contextualizing them comparatively, one can reach the identification of some types of social antivaccination groups COVID-19. There are recent analysis practices of using the concept of the social world to describe how cultures and their related groups are structured about this type of vaccination (MacLean et al, 2021). In line with those practices, we will continue to try to contextualize the opinions regarding the anti-COVID-19 vaccination in Romania, in a comparative perspective, using the data of the rapid Eurobarometer 494, made in May 2021 by IPSOS for DG COMM, the European Commission (IPSOS 2021). Which are the countries of the European Union (EU) that are similar or differ greatly about Romania, from this point of view? ¹

A simplifying perspective coming from common knowledge could orient us to answers in terms of age, education, and residential environment. It would be expected that the most reluctant to the idea of anti-COVID-19 vaccination would come from the youth with access to social networks online and with a relatively low level of education. That's all? Are demographic segments favourable or unfavourable to vaccination the same in all EU countries?

The answer that we present here, with survey data, claims that we are dealing, very likely, with relatively diffuse social groups pro- or anti-vaccination COVID-19, structured on several criteria, relatively different by groups of countries. To these groups, we will call social worlds. The option comes, on the one hand, on a line of lasting thinking in social research (Strauss 1978), but also starting from recent research from studies of substantiation of public policies in the field of health (MacLean et al, 2021).
Approach

To understand one Eastern European society on attitudes on anti-COVID-19 vaccination we adopted a quantitative multi-sited approach (Beauchmin 2014) by comparing results of the same regression model in different regions and countries of Europe. We started from the view that understanding the attitudes on COVID-19 vaccination in a European country might be useful to compare contexts as given by causal models between East and West, among different countries in Europe, and among different regions of the same country selected for the case study.

For a first identification of the phenomenon that interests us, we have resorted to a measurement of the orientation of the interviewed people to the anti-COVID-19 vaccination through three indicators, selected from a longer list of questions of the aforementioned survey. The selection started from the premise that a person is oriented in favour of the idea of vaccination against COVID-19 if he/she supports to a greater extent than a) vaccination has more benets relative to the costs; (b) seriousdiseaseshavedisappearedbyvaccination; c) COVID-19 vaccination isacivicduty. It is a measurement made by reference to the actional, cognitive and affective-moral dimensions of attitude, under the three-dimensional model of measuring any attitude (Rosenberg&Hovland, 1960, Chelcea 2008). In other words, we considered that anti-vaxxers evaluate costs as higher than the benefits, that serious diseases cannot be overcome by vaccination and do not link the decision to vaccination to a civic responsibility toward public health. A pro-vaccination attitude index (IPVO) was compiled by aggregating the answers to the questions associated with the three indicators mentioned. The higher the positive value of the index, the more intense the attitude in favour of vaccination. The higher the negative value of IPVO, the more intense the anti-vaccination attitude is. Values close to zero indicate a hesitant attitude.²

In the analysis, however, we tested the hypothesis (H1) that claims that attitudes towards vaccination to prevent COVID-19 have not only quantitative variations, of intensity, between the two pro- and anti-vaccination poles. Based on this hypothesis, through a different procedure, we combined the three indicators mentioned above and generated six types of vaccination attitudes. Besides the extreme categories of pro-vaxxers and anti-vaxxers (AV), there were also four intermediate categories: AV concerning COVID-19 but with the acceptance of the idea that vaccination "in general" can be good, hesitant with an attitude of medium intensity, AV with moderate intensity attitude but accepting the idea that the anti-COVID-19 vaccination it is a civic duty and AV with a moderate intensity attitude but accepting the idea that vaccination, in general, can be useful ( see Annex). We have measured, therefore, the main variable analysed – the attitude towards the anti-COVID-19 vaccination both quantitatively, by an index (IPVO) and qualitatively by the six types of attitudes mentioned.

How citizens differ, in terms of their attitude towards vaccination against COVID-19, was determined by using both measurements.

A second hypothesis (H2) that we have adopted, argues – starting from the existing literature and the survey data available for testing – that qualitative or quantitative variations in attitudes towards COVID-
19 vaccination are dependent on status characteristics, medical experiences, and trusted expectations of subjects (Figure 1). Nationally representative surveys for England and Ireland, for example (Murphy et al. 2021), indicate a higher propensity of resistance/hesitation to the COVID-19 vaccine for young women in the suburbs in low-income population groups. Also, there it was found that the distrust in the medical Authorities and the doctors favours the attitudes of resistance or hesitation about the anti-COVID-19 vaccination. All these status factors, personal experiences, and confidence expectations act on attitudes towards the COVID-19 vaccination through values, norms, or ideologies that could not be measured with the available survey data from the Eurobarometer.

The social world of COVID-19 vaccination can be approximated, however, by the factors mentioned regarding the status-experiences-trust. Of course, it is about groups or social worlds with variable geometry that we can approximate with the help of the available data. These data allow us to identify the social worlds of attitudes toward COVID-19 vaccination by combining information about EU countries and the status-experience-trust characteristics of the population in those countries.

To be able to place Romanians in the European context of their attitudes towards the anti-COVID vaccination, we have resorted to two types of descriptive and explanatory analyses. At the descriptive level, we have grouped the EU countries from the perspective of the major similarities they have in terms of specific attitude profiles, measured by IPVO averages on the main categories of status factors. This is how we found, as expected, that Romania belongs - in terms of the attitudinal profile associated with the COVID-19 vaccination - to the group formed by Poland, the Czech Republic, and Lithuania. The characteristics of the people interviewed in this grouping are compared, on the topic under discussion, with the characteristics of six other groupings of EU countries. Subsequently, through prediction analysis, we establish the specificity of the attitudinal profile of Romanians from the perspective of the social worlds of vaccination against COVID-19. The technical details of the analysis will be mainly written in the notes at the end of the material or at the footer of the tables/graphs.

In the last section of the material, we analyse the factors that influence the intentions of vaccination in those who, at the time of the survey, were still unvaccinated against COVID-19. In the series of preachers, we have also included the measure regarding the attitude towards the COVID-19 vaccination, to see to what extent these attitudes matter to the expected behaviours in the field.

**The European Context**

EU countries are grouped in terms of attitudes towards COVID-19 vaccination, specified on 17 categories of status-experiences-trust, into seven groups (Figure 2). From this point of view, Romania appears in the similar group it forms with Poland, the Czech Republic and Lithuania. Surprisingly, the attitudinal profile of people in these countries related to COVID-19 vaccination is closest to that of Austria and France. Hard to say why it is so, but the whole analysis indicates a high degree of validity of the data. Secondly, the grouping of countries to which Romania belongs naturally resembles another grouping formed by the
smaller Eastern countries (Hungary, Croatia, Bulgaria, Slovenia, Slovakia, and Latvia). The countries of the old European Union, different from France-Austria, are separately placed in four groups.

The specificity of the seven groups of European countries in terms of attitude towards the COVID-19 vaccination appears clearly when we intersect it with another grouping made but at an individual level, regarding the types of motivations underlying the acceptance or non-acceptance of the vaccine in question.

If we change the perspective from a group of countries to EU countries, we will come to a similar picture. Romania is, according to the survey data we work with, in the group of the top 10 states with the maximum share of anti-vaxxers, in the ninth place. Of the 10 states, nine are former communist countries.

From the perspective of the types of attitudes concerning the anti-COVID-19 vaccination, we register (Table 2) the same belonging of Romania to the main group of Eastern European countries, former communists (Latvia, Slovakia, Hungary, Bulgaria, Poland, and Romania). Austria's presence in the group that also includes Hungary, and Slovakia refers to the idea of an association of anti-vaccination against COVID-19 and with a culture of central Europe (Chesnais 1981).

The fact that Romania is in the category of countries with a significant share of anti-vaxxers does not mean that the whole country is the same. Anti-vaxxers are concentrated, according to the survey data we are working with here, mainly in the CENTER development region. Anti-vaxxers who are more tolerant and accept that the vaccine, in general, can be good for other cases, are located mainly in the development regions South-East and South-West Oltenia. The region of the capital city together with Ilfov is specific for those with medium attitudinal orientation, between anti- and pro-vaccination. For the rest of the development regions in the country, there are no significant associations with the type of attitude towards the anti-COVID-19 vaccination.

**Conditionings That Give The "social Worlds"**

Across the entire sample, attitudes conducive to COVID-19 vaccination are stronger for male retirees with a higher level of education in major cities. The fact of having been vaccinated at least once as an adult, regardless of the disease prevented, favours pro-vaccination attitudes against COVID-19. Also, in the series of conditions favourable to the vaccination attitude against COVID-19 is the trust in the governmental or local Authorities and the doctors. In contrast, high trust in social networks on the internet disadvantages pro-vaccination guidelines.

Attitudes of refusal or hesitation in anti-COVID vaccination are favoured by values of opposite direction to those specified for the aforementioned factors (Table 3). This is a picture, overall, of the EU total. When the analysis is repeated on specific groupings of countries, the relations are different. In the group of maximum interest here, the one that includes Romania, the significant relations and the intensity of the effects of influencing the attitude towards vaccination are different. The first term of comparison is given
by the situation in the small countries of Central or Eastern Europe. In the group of countries that includes Romania, residency in large cities counts for the attitude towards the anti-COVID vaccination, as it is in the total EU sample. In contrast, this factor is insignificant in the case of interviewees from small EU countries in the centre or east of the EU, but it is significant in the grouping that includes Romania.

The comparison of the populations of the former communist countries, dominated by the antivaccination attitudes against COVID-19, with the populations of Italy, Spain, and Sweden, especially oriented toward pro-vaccination, says a lot about the socio-cultural conditions in the field (Table 2). In the three countries of the Old European Union, the attitude towards vaccination against COVID-19 is not so strongly structured on social worlds, on characteristics of residence, gender, age, and occupation, as in the former communist countries. Even the experience of having been vaccinated as an adult matter less, albeit significantly, in the three EU societies than in the societies of the central and eastern PARTS of the EU. Only the level of education (measured here by tertiary education) has a stronger impact in Italy-Spain-Sweden compared to the effect in the former communist countries on the anti-COVID-19 vaccination attitude.

Trust in institutions and doctors stimulates the pro-vaccination anti-COVID option in Eastern and Central European countries more than in pro-vaccination ones in the Old European Union. Trust in online networks alone has greater effects on vaccination attitudes in the Old compared to the New EU (results of the regression analysis not presented here).

Conditioning the attitude towards anti-COVID vaccination through the experience of having endured a vaccination as an adult, for whatever disease, has a peculiarity in Romania. According to the survey data we use here, the lowest vaccination rate for an adult, different from that for COVID-19, was recorded, at the time of the survey, in Romania (41%), compared to an average of 70% for the total EU and 59% for the total former communist countries in the EU. The very small percentage of ever-vaccinated adults in Romania explains, to a great extent, where the Romanians' resistance to the anti-COVID-19 vaccination comes from and, at a regional level, why Eastern Europe has been more resistant to the anti-COVID-19 vaccination than the Western one. The situation was similar in 2019, for Romania, with the survey data from another Eurobarometer (Vulpe 2020, Vulpe&Rughiniş 2021).

Consequently, public policies to increase the rate of vaccination against COVID-19 could get higher performance if focused mainly on the areas/categories where rates of general vaccination before epidemics were low and on how to increase the public trust in institutions that are relevant for the vaccination against COVID-19. Low general vaccination rates, in Romania, are, specific to the rural population, low-educated people and women (the specification is based on a multivariate analysis that was not included in the presentation).

A more detailed image could be gotten if one considers the predictors of IPVO by each of the eight development regions of Romania, and for the country as a whole (Table 4). Sociodemographics are less relevant in predicting the attitude towards vaccination against COVID-19 by NUTS 2 regions in Romania compared to the situation in Eastern Europe. Residence milieu, age, gender, retirement and education do
not count as significant predictors in Bucharest-Ilfov, North-West, South-West and South-East regions. Men are more pro-vaccination oriented in Centre regions, younger persons disfavour the vaccination against COVID-19 in the West region, and retired persons are significantly in favour of pro-vaccination in South-Muntenia.

Trust in institutions and general vaccination experiences are by far the most relevant predictors of attitudes towards anti-COVID-19 at the regional level. The higher the trust in Government, local administration, health Authorities and health specialists, the higher the propensity of adopting a pro-vaccination attitude against COVID-19. It is especially in the Centre and North-West regions that trust has a maximum positive impact on pro-vaccination attitude. The negative impact of trust in online networks towards anti-COVID-19 vaccination is limited to people from West, North-West, South-West and South Muntenia.

To what extent can the previously discussed relationships, in the total sample, also be found in those who were unvaccinated at the time of the survey, in May 2021? We will answer this question in the next section.

Vaccination Intentions Of Un-vaccinated People

Focusing the analysis on those who were not vaccinated at the time of the survey is important. They represented, at the time of the survey, around 57% of the population over the age of 15 in the EU (Table 5). Those who already had a COVID-19 vaccination accounted for 37% of the sample. Naturally, vaccinated appear with a high acceptance attitude of the vaccination against COVID-19. Non-vaccinated people have strongly differentiated attitudes towards coronavirus vaccination, depending on the intention they had. Those who intended to get vaccinated soon had, again naturally, a very favourable attitude to vaccination (the average of the IPVO index is equal to 33.5). Those who declared themselves to be undecided seem to be, to a large extent, anti-vaxxers.

A more accurate picture of the socio-demographic and cultural conditionings of vaccination intention results from the inspection of the data in Table 5. Eastern European countries whose grouping, which is also part of Romania, are characterized by reduced intention, well below the European average, of vaccination against COVID-19. The strongest intention to reject vaccination in terms of intentions is for Eastern Europeans in small countries with less than ten million inhabitants. At the opposite pole are the citizens of Belgium-Netherlands-Denmark-Finland with the highest proportion of vaccination for the unvaccinated.

Across the EU, the positive attitude towards COVID-19 vaccination is a factor favouring the intention to vaccinate, keeping under control the effect of the other factors in the model. The finding may seem pleonastic, but it refers to a very important actional premise: if you want to increase the number of those who get vaccinated, it is fundamental to communicate with them in such a way as to structure an attitude favourable to this kind of vaccination.
Otherwise, the typical European, still unvaccinated against COVID-19, at the time of the survey, tends to get vaccinated especially if he is a man with residency in a large city, has had at least the experience of another vaccine as an adult, has a high level of trust in institutions of central and local government and doctors and lives in a country with a high vaccination rate at the time of the survey\textsuperscript{6}.

A country-by-country examination of prediction relationships, according to model 1 of Table 5, indicates the great variability of statistically significant prediction relationships. The only factor that appears with a positive and significant effect in the prediction of vaccination intentions in the unvaccinated, in all EU countries, is the attitude towards this type of vaccine (IPVO). In the case of unvaccinated Romanians, the level of trust in the relevant administrative or medical Authorities is added with a positive effect. The only country in the EU that still has a similar prediction configuration is Ireland. In the case of the two countries, the impact of trust in the relevant institutions on the intention to vaccinate is maximum. Hard to say why that's the case. It can be the effect of objective situations, but it can also be the effects of how subjects are selected or data weighted. These are likely different conditions that, however, lead to the same result.

**Conclusion**

The Romanian way of reporting on the anti-COVID-19 vaccination fully fits into the specific model of the former communist countries of Eastern and Central Europe (Table 1 and Table 2). In these, plus Austria, we meet the highest propensity towards anti-vaccination against COVID-19. In the north (Sweden, Finland, Ireland) and the south of the European Union (Italy and Spain) the greatest concentration of pro-vaccinists occurs, by contrast.

The approach confirms the hypothesis that holds that the social worlds of attitudes toward COVID-19 vaccination are structured not only quantitatively but also qualitatively. There are not only pro-vaxxers, anti-vaxxers, and hesitants but also intermediate categories, qualitatively structured. So are the anti-vaxxers who accept, however, that vaccination in general, in other situations, is good, or those who are moderately anti-vaxxers but who accept the idea that vaccination is a civic duty or those who are moderately anti-devastating but who argue that vaccination in general, in other cases, is good.

Inside Romania, the anti-vaxxers were, at the time of the survey (May 2021), located mainly in the Center development region. The moderate anti-vaxxers, with the acceptance of the need for vaccination but other diseases or other cases, was located especially in the south of the country, in the south-eastern development regions, and the South-West Oltenia. The rest of the types of attitudes towards the anti-COVID-19 vaccination are not significantly associated with any of the development regions of Romania.

The analysis centred only on the vaccination intentions of the unvaccinated makes it clear that attitudes matter a lot. Those who have been registered as having a strongly favourable attitude to vaccination are determined to get vaccinated soon (Table 5). Another proof that the level of effective communication is very important in the equation of increasing the number of those vaccinated.
Both attitudes to vaccination and vaccination intentions are significantly dependent on the socio-demographic composition and previous life experiences. At the European Union level, those with well-structured intentions to get vaccinated, being unvaccinated, live in major cities, have the culture of previous vaccination as adults, and, simultaneously, trust the government of the country in which they live, local Authorities, and doctors. These findings allow us to support the idea that there are social worlds of attitudes towards COVID-19 in the sense of communities of discourse or language on the subject, differentiated according to the residential environment, age categories, gender, education, vaccination experiences as an adult but before the pandemic and the degree of trust in the relevant Authorities for the management of the COVID-19 crisis or on social media. Such social worlds are differentiated by groupings of countries.

The typical Romanian who supports vaccination tends to have a high-level education has been vaccinated as an adult at least once before, and trusts the government, medical authorities, and local authorities. The structuring of the anti-vaccine trends of many of the Romanians is generated, to a significant degree, by the fact that it is in this country that one records the lowest share of people who were vaccinated as adults, before the pandemic.

Of course, the model of analysing the determinants for attitudes and intentions associated with the COVID-19 vaccination would gain explanatory power if it were better specified. It would be very likely that in its composition it would be effective to include variables related to the state of infection in the first stage of the pandemic with the new coronavirus, the experiences of international migration of the population at the regional-national level, the belonging of national/regional spaces to different cultural models, etc. Such an expansion of the analysis model is also dependent on accessibility to adequate data, which is quite difficult to identify in their multi-level version.

Annexe: Constructing and validating the typology of attitudes towards vaccination against COVID-19

The typology of attitudes towards the adoption of the anti-COVID-19 vaccination was achieved through cluster analysis (k means cluster) using as input data the indicators to build IPVO, plus this synthetic index (after being rewritten to have only five ordinal categories). We retained for analysis the cluster variant with six categories after running and classification variants with 3, 4, 5 or 7 categories. Anti-vaxxers are in a group with a low mean value of IPVO and, also, for all the other three defining indicators. A special category of anti-vaxxers is formed by those with a low value of IPVO but with a high agreement with the sentence that serious diseases disappeared thanks $\rightarrow$ va $\in$ e.

Pro-vaccination-oriented people tend to record high scores on all the four indicators of the classification. The two categories of moderate anti-vaxxers have low averages on three of the defining indicators but a higher one on a specific item. Moderate AV with tolerance to the idea that the vaccine against COVID-19 is a civic duty is rather inconsistent by the fact that their general attitude on anti-COVID-19 vaccination should be avoided but accept, at the same time, the idea that vaccination against COVID-19 is a civic duty. There is also a rather large segment of the population, of about 19%, supporting the idea that the
vaccination against COVID-19 is not so indicated but, on the other hand, supporting the view that vaccination, in general, is a good practice. Middle range orientation is, in between pro- and anti-vaxxers have a share of about 14% in the whole population of the European Union.

The interpretability of the categories generated by cluster analysis is largely supported by results of a multinomial regression having the type of attitude towards vaccination against COVID-19 as a dependent variable and as predictors of all the variables that were used in the linear regression presented in Table 3. Here are some of the findings from the multinomial regression (by considering middle range orientation as a reference category) with the whole sample for the EU:

- Living in cities is a significant positive predictor only for pro-vaccination people.
- Higher age is a favourable precondition only for pro-vaccination and for the moderate AV accepting that the vaccination, in general, is a good practice.
- Lower education is specific for anti-vaxxers and moderate anti-vaxxers.
- High trust in institutions of administration and physicians is highly specific for pro-vaccination-oriented people and high distrust towards the same institutions is specific for anti-vaxxers.

Notes

1. Data collected by CAWI, autocomplete, used here by correcting with the weighting variable w87 from the official data file, available at https://search.gesis.org/#.

2. IPVO is constructed as a factorial score from the three indicators mentioned after they have received a direct scaling. To make it easier to read, the index was multiplied by 100, its positive values indicating the intensity of the positive attitude, in favor of vaccination and the negative values being significant for the intensity of the anti-vaccination attitude to prevent COVID19.

3. In the decreasing hierarchy of percentages of anti-vaccineists, with data from Eurobarometer 494, the series consists of Latvia, Slovenia, Bulgaria, Slovakia, Hungary, Croatia, Austria, the Czech Republic, Romania and Poland.

4. An analysis of vaccination rates at local level indicated a reduced vaccination rate for the Bucharest-Ilfov region. It is a question whether the medium-level, hesitant orientation with which the region appears in the Eurobarometer survey does not, in fact, translate into reduced vaccination.

5. The results of the adjusted standardised residue analysis on the basis of the assessments in this paragraph shall not be included in the presentation.

6. The fact that the effective vaccination rate at country level is a significant predictor of vaccination intentions is also a way of validating the survey data (criterion validity).

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Declarations
The author has no relevant financial or non-financial interests to disclose.

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References


Tables

Tables 1 to 5 are available in the Supplementary Files section.
Figures

Figure 1
The theoretical model of analysis

Figure 2
See image above for figure legend

Supplementary Files

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