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VACCINE HESITANCY MOVEMENT IN THE DAYS OF THE COVID-19 CRISIS:

A POPULIST CHALLENGE TO REPRESENTATIVE DEMOCRACY IN UKRAINE?



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1. Acciological standpoint and research terminology

While starting the project, we were aware that attitudes to vaccination is a high-risk area, where rational arguments are interspersed with moral self-indulgence, and belonging to another camp is tantamount to intellectual imperfection in the eyes of opponents. Only complicating our task, the concept of “populism” is also usually used as an accusation of political irresponsibility and empty demagoguery. Given this, we were likely to face a significant challenge: we had to convince people who hold populist beliefs and do not trust vaccines not to be afraid to acknowledge this stigma, overcome it, and describe their beliefs. Our task, however, was simplified by the fact that from the very beginning, we took a value-neutral approach to the subject; that is, we did not seek to convince populists that their political views were wrong or people who had reservations about vaccinations that they posed an imminent threat to the public health. As we learned during communication with respondents, most were honest people and good citizens, and differences in political views and attitudes to vaccination do not prevent an open conversation.

And while we can only hope that such personal conclusions will contribute to reducing the aforementioned social distance of mutual distrust, we are convinced that using the proper terminology is the first step towards this. Actually, naming phenomena correctly - without unnecessary stigmatization and accusations - is the origin of value-neutral research.

As scholarly literature suggests, the “vaccine debate” cuts into the societal fabric of any community and creates several types of attitudes. First, there are **vaccine enthusiasts**, namely people who believe in the effectiveness of vaccines as a way to protect against infectious diseases. On the other side of the spectrum are the **vaccine objectors**: they actively reject all recommended vaccines for various ideological reasons. According to scholarly estimates, vaccination opponents in Canada, the USA, and France make up 2-4% of the population (Friedman, 2018). Finally, **vaccine hesitators** are located between the two poles. They are people who are ambivalent about vaccination. Typically, they espouse some idiosyncratic view; for example, they reject some vaccines but accept others or do not follow the recommended vaccination schedule. The wave of COVID-19 has undoubtedly expanded the cohort of vaccine hesitators because some people did not trust the newly created vaccines against this disease, although they had a positive attitude toward already traditional vaccinations such as DPT.

Another important methodological and terminological distinction concerns a fundamental gap between belief and behavior. This gap, which is understandable at the private level, is not always correctly accounted for in the broader social sphere. For instance, many mistakenly think that people with radical political views must necessarily resort to political violence. Others are surprised when an ardent critic of Westernization uses such an achievement of modern civilization as 5G. The fact is that *beliefs* and *behavior* do not have a perfect correlation. This observation is also true for vaccine hesitancy: the level of hesitation about vaccines (beliefs) is much lower than that of unvaccinated people (behavior). People often doubt that vaccines are safe, effective, and appropriate to the extent that representatives of the medical establishment claim. However, regardless of such

doubts, people still get vaccinated. And vice versa, one can *consider* vaccination the best protection against diseases - and still *not find* time or money to vaccinate against seasonal flu. The gap between belief and behavior is responsible for the apparent paradox that in France, one in three residents doubts the safety of vaccines (Gallup, 2019), yet coverage with major vaccines is close to 100% (Santé publique France, 2017). In other words, vaccine hesitancy as a point of view does not correlate with opposition to vaccines as a life choice.

Given this gap, our study deliberately focused on vaccine hesitancy as a set of beliefs. The reason for this was the goal of our investigation. Since we sought to study the interdependence between populism as a system of expectations regarding the political reality, comparing it with a set of views on the vaccination's viability was *much* sound methodologically. That is why we asked our respondents to indicate their attitude to vaccination and not the fact whether they were vaccinated, e.g., against COVID. After all, a person who, under the pressure of circumstances like the threat of losing his/her job, had to vaccinate in 2020 is unlikely to change his/her views about vaccination's feasibility, acceptability, and safety. Thus, **vaccine hesitators** and **vaccine enthusiasts** constituted the two groups of our study, and we use these terms throughout as purely descriptive.

The measure of respondents' inclination towards populism was another component of our analytical question. The main challenge was that the concept of populism is difficult to conceptualize. Scholars advanced four different strategies for defining populism. The first describes it as an *economic policy* of excessive public expenditures on social policies (overspending) or at least promises to implement such policies, which political actors make in order to increase their electoral attractiveness (Cardoso and Helwege, 1991; Guriev and Papaioannou 2020; Guess and Savage, 2021).

The second strategy defines populism as a *political strategy* of a political outsider who tries to compensate for his/her lack of political resources and experience by resorting to declarative self-identification with the needs of the people (Bar, 2009; Weyland, 2021). Such outsiders are ideological opportunists: they promote any views to enjoy popular approval without actually professing any. An important observation made by the strategic approach is the exposure of the so-called outsider's "double game": he/she pretends to take into account the people's will until he/she gains political power. As soon as the office is assumed, the populist leader begins to impose his/her will, reducing the number and intensity of consultations with the people to a minimum (Weyland, 2001).

The third model considers populism as a thin *ideology*. Its conceptual core is the essentialization of the opposition between the people and the elites and the subsequent moralization of this distinction. Populism as an ideology asserts that in any political community, there is a good people who should be the source of sovereignty and immoral elites who dominate by trickery and force, imposing policies detrimental to the general public (Mudde and Rovira Kaltwasser, 2012; Hawkins et al., 2019; Zulianello, 2020). Elites can be political, cultural, or economic, but their goals and values are, by definition, antithetical vis-à-vis the needs and aspirations of the people. Populism as an ideology is inherent in denying the principle of pluralism: it rejects the interpretation of the people as a composite collection of different interest groups. On the contrary, populist ideology interprets the people as homogenous and indivisible source of all good, whereas various minorities or splinter groups are natural allies of immoral elites.

The fourth approach conceptualize populism as a sociocultural phenomenon, namely a *behavior* that tries to express the true essence of things regardless of conventions and rules (Moffit, 2016; Ostiguy, 2020; Ostiguy et al., 2021). Therefore, the sociocultural interpretation of populism point to the purposeful attempts of populist actors to represent - through their wording, clothes, and expressed values - the true nature of things, concealed by etiquette, political correctness, or international norms.

Undoubtedly, there are some commonalities proper to the four described approaches. For instance, populism as an ideology that opposes the people and the elites is correlated with a politician's behavior of wearing simple clothes and using everyday language to create the impression in his/her electorate that he/she is "theirs." Similarly, populism as a promise of overspending on the social sphere is commensurate with the strategy of a political outsider who seeks power. However, our research focused on the societal dimension of populism: individual citizens may subscribe to the ideology of populism and approve of populist representation, but unless they are politicians, they cannot implement populism as an economic practice or political strategy. In our study, we sought to measure the degree of populism of private citizens; in other words, we were interested in the societal dimension of populism. Therefore, it was appropriate to use assumptions of the ideological and sociocultural approaches to operationalize the phenomenon.

Seeking to combine recent discoveries about the nature of populism with our commitment to the principle of value neutrality, we inscribed the conceptualization of populism in the fundamental inability of each individual to understand the world in all its complexity, which results in the individual's tendency to use simplistic categories. If such a simplification acquires a reference to the destructive influence of elites or narrow interest groups that begin to impose their agenda on the people, this indicates that the person is a political populist (cf. Rosanvallon, 2020). Populists demand that their interests be represented in politics by actors who bear values and cultural markers that clearly indicate belonging to the people. So, for the purposes of our study, we defined populism as a **set of ideological settings that absolutize the opposition between the morally perfect people and a hostile triple coalition represented by elites, minorities, and transnational corporations**. Holders of these beliefs tend to interpret political processes as a confrontation between good forces, which represent the people, and evil forces, which represent the triple coalition. Besides, populists are likely to expect that belonging to the people should have visible socio-cultural markers like ordinary (not refined) language, plain clothes, casual tastes, etc.

The corollary of our definition of populism is that no person today is able to fully comprehend how the technologies that lay the foundations of modern civilization function and how the phenomena of a technological, political, economic, and cultural nature are interconnected. In his/her field, an individual specialist understands the principle of operation of Wi-Fi or nuclear power plants, the logic of studying stem cells or the role of oil in the production of plastic, the influence of the institutional design on the likelihood of social conflicts or the importance of the Scythian heritage for the formation of the identity of the inhabitants of the Northern Black Sea region. However, outside this narrow field of specialization, each of us faces a complex and incomprehensible world of only partially managed processes and poorly predicted consequences. This means that potentially each of us can be a carrier of populist beliefs, and therefore we use the concept without any accusations, rather as a simple recognition of the fact, as a value-neutral approach implies. Furthermore, our model

suggests considering the propensity for political populism as a location on a scale. In other words, to be a populist means not to espouse some unique political views but rather to experience pronounced distrust of elites, minorities, and transnational actors.

Members of the national medical establishment, international organizations that represent it (such as WHO), and pharmaceutical corporations responsible for producing and selling vaccines are only some contextually dependent personifications of the hostile triple coalition. However, when their influence is being perceived as decisive, people who hold them tend to request reducing this influence by political means. Therefore, the question “to vaccinate or not,” although it originally belongs to the categories of private and public health, is politicized, establishing a connection with populism.

2. COVID-19, vaccine hesitancy, and populism: a global overview

The COVID-19 pandemic and the emergence of new vaccines to combat it forced specialists from various fields, in particular, epidemiologists, sociologists and political scientists, to focus on studying the phenomenon of vaccine hesitancy, its causes and ways to overcome it (Karafillakis, et al., 2022; Sorell and Butler, 2022 ; Horton, 2022). In addition to studies that focus exclusively on the coronavirus pandemic and vaccination against coronavirus, studies that focus on skepticism about other vaccines, including the long-known vaccines for measles, polio, and other infectious diseases, have gained relevance (Kennedy and Michalidou, 2017). According to a global study of “vaccine hesitancy”, that is, vaccine hesitancy as we conceptualize it in this work, to one degree or another is present in all countries of the world, and scientists have not found a direct connection between socio-economic, cultural and religious characteristics of countries and the level of indecision of citizens regarding vaccines (Lane, et al., 2018). Vaccine hesitancy is defined by scientists as “a delay in accepting or refusing vaccination despite the availability of vaccination services” (World Health Organization, 2019). In 2019, the World Health Organization declared vaccination indecision as one of the biggest threats to global health, along with air pollution, the spread of non-communicable diseases, the development of antibiotic resistance, underdeveloped primary care systems and HIV/AIDS.

The challenge of vaccine hesitancy is particularly relevant for Europe, which as of 2016 was the “continent of vaccine hesitators” with the lowest level of vaccine trust in the world (Larsen, et al., 2016), and where the COVID-19 vaccination campaign has further contributed to the decline in trust. (Karafillakis, et al., 2022). According to *The Economist's* survey of September 2021 on coronavirus vaccines, Germany is the leader among EU countries in terms of citizens' reluctance to get vaccinated and their mistrust of vaccines (up to 25 percent combined in both categories) (The Economist, 2021). An even higher rate of vaccine mistrust is observed in the US, where as of fall 2021, more than a quarter of the population either chose not to get vaccinated against COVID-19 or had serious doubts about getting vaccinated (The Economist, 2021). Canada, as well as France, Italy, Britain and Spain, also showed quite high rates of mistrust of vaccines (The Economist, 2021). Vaccination hesitancy is also widespread in Eastern Europe, where at the end of 2020, more

than 40 percent of the population of Poland and Hungary spoke against vaccination against COVID-19 (The Economist, 2020).

Table 1. Reasons for vaccine hesitancy directly related to the virus or vaccination in a public health context

Factor	Vaccination against COVID-19	Vaccination in general / vaccination against diseases other than COVID-19	Research examples
Perception of the danger of the virus (risk perception)	An argument that is used in two contexts: 1) to show a higher willingness of the population to vaccinate against COVID-19 as a less known and more dangerous disease than the flu and 2) to illustrate the connection between the change in the perception of the level of danger of the virus (the emergence of omicron as a milder versions) and vaccine hesitancy.	Risk perception is an important behavioral factor for understanding what drives individuals in the decision-making process. In relevant studies, considerable attention is also paid to the peculiarities of cognitive processes during risk assessment (Martinelli, et al., 2021).	Caserotti, et al., 2021 McAteer, et al., 2020 Qin, et al., 2022 Martinelli, et al., 2021
Concerns about the artificial origin of the virus	A factor influencing both individuals' assessment of their risk of contracting COVID-19 and attitudes toward vaccines as an artificial means of combating an artificial threat.		Salali and Uysal, 2020 Haque and Pant, 2022
Concerns about the safety of vaccines	A common argument that is narratively closely related to distrust of vaccines developed "too quickly" and uncertainty about vaccine efficacy.	The traditional argument of anti-vaccinators, known since the XVIII century, which is actively used in conspiracy theories (for example, regarding the connection between vaccination and infertility).	Salmon, et al., 2015 Farhart, et al., 2022 Caserotti, et al., 2021
Lack of confidence in the effectiveness of vaccines	A common argument that is narratively closely related to distrust of vaccines developed "too quickly" and uncertainty about vaccine efficacy.	Along with the argument about the dangers of vaccines, is one of the traditional arguments of vaccine hesitators, which is a component of the assessment of risks or "costs and benefits".	Farhart, et al., 2022
Belief in natural immunity as more effective compared to immunity from vaccines	The factor according to which natural immunity (i.e., acquired as a result of getting sick with COVID-19) is a more reliable and effective means of protection than immunity obtained as a result of vaccination, and it is better to get the coronavirus than to get vaccinated	Debates regarding the relationship between natural immunity and immunity from vaccination also exist in the context of other viruses	Kaim and Saban, 2022 Pugh, et al., 2022 Shen, 2019

Analysis of studies focusing on the reasons for mistrust of vaccines among European and North American citizens allows us to single out a number of factors that researchers associate with vaccine hesitancy both in general and in the context of COVID-19. It should

be emphasized that the influence of relevant factors is often complex, and each individual's decision not to vaccinate or not to vaccinate their children is most often related to a number of interrelated factors (Farhart, et al., 2022). Factors reflected in the current literature on vaccination against COVID-19 and vaccination against other diseases are summarized in Tables 1 and 2. For convenience, we categorize factors as those directly related to the virus and/or vaccines and those of a less general nature and rather extrapolate other people's views and ideas on the issue of vaccination and health care. This classification is also useful for understanding the arguments of the anti-vaccination movement and the arguments that link certain political views to vaccination hesitancy.

While the factors behind the hesitancy to vaccinate in the case of COVID-19 are largely consistent with those described in the general vaccination literature (except for the idea that the virus is man-made), factors of a different nature, in particular, are more closely related to the political views of individuals, show marked differences in the case of COVID-19. As will be demonstrated below, this difference is largely due to the use of COVID-19 in political struggle and the media's role in spreading misinformation about COVID-19 and vaccines. In addition, the more radical narratives about vaccination against COVID-19 compared to vaccination against other diseases are due to the unprecedented nature of the restrictions that countries around the world have put in place to fight the corona crisis. Although, on the one hand, restrictions (in particular, lockdowns) have been shown to contribute to citizens' perception of the risk of contracting COVID-19 as high and to promote vaccination (Caserotti, et al., 2021 for the elderly), there are studies that suggest the opposite effect (Constantinou, et al., 2021). As demonstrated below, the positive correlation between lockdowns and vaccine hesitancy is closely related to the proliferation of conspiracy theories, according to which the creation and spread of the virus and the subsequent vaccination of the population are part of some global plan of elites (Constantinou, et al., 2021).

Thus, the review demonstrates a close relationship between the factors that determine individuals' assessment of vaccination risks, including their views on attitudes towards the state and its institutions, as well as moral and religious beliefs. In turn, as the next section of the study demonstrates, conditioning attitudes to vaccines by moral, religious and political views is a key factor in the politicization of the vaccination issue and its use by populist movements in Europe. Not the last factor in the evolution of the connection between vaccine hesitancy and populism is the possibility of disseminating false, in particular, conspiracy information using social networks. As we will demonstrate below, misinformation in social media is one of the central topics explored in the context of the connection between vaccine hesitancy and populism, and has gained particular relevance due to the coronavirus pandemic, related restrictions and vaccine campaigns in Europe and the United States. Finally, it is important to note that vaccine hesitancy in relation to COVID-19 has significant potential to negatively influence skepticism about other, even long-established vaccines, such as polio or measles vaccines. Thus, the need for an in-depth understanding of the drivers of vaccine hesitancy and its relationship to the political beliefs of individuals and political movements is dictated by the need to develop policy responses to vaccine hesitancy in the context of both COVID-19 and other diseases.

Table 2. Reasons for vaccination hesitancy that are indirectly related to the health care context

Factor	Vaccination against COVID-19	Vaccination in general / vaccination against diseases other than COVID-19	Research examples
Appeal to broad moral values of freedom and freedom of choice. A vision of the state as a guarantor of freedom rather than a rule-making institution	Opposition to the role of the state in promoting vaccination	Similarly to the case of COVID-19	Peng, 2022
Moral and religious ideas, in particular, regarding unethical research during the development of vaccines	The unethical use of abortion-related cells for vaccine development	Religious prohibitions as a common factor in vaccine refusal, rather than research-related factors	Giublini, et al., 2021 Jones, 2022 Marti, et al, 2017
Rigidity, global and mandatory nature of restrictions in connection with COVID-19 as a factor of mistrust of the authorities and anti-elitism in a broader sense	Distrust of the state as a source of restrictions, particularly due to the connection between vaccination and the ability to attend events and public institutions	Inapplicable to the restrictions itself, but the issue of (dis)trust in the state plays a key role in the issue of attitudes towards vaccines in general	Jennings, et al., 2022
Distrust of the state and its institutions in a broad sense, opposition between the population and the state	A key factor in indecision about vaccines in general and vaccines against the coronavirus. The factor of trust in the state and its institutions is widely studied in different contexts and in connection with various factors, in particular, the peculiarities of the functioning of the political system and the social contract in different countries (Blind, 2006)		Jennings, et al., 2022 Trent, et al., 2022 Pertwee, et al., 2022
Conspiracy views, in particular, regarding the use by major geopolitical players of viruses and / or vaccines as biological weapons / means of birth control	Wide spread in connection with COVID-19, with the complexity of determining its nature, restrictions and the coronavirus	Applies to vaccines and vaccine hesitancy in general	Allington, et al., 2022 McCarthy, et al., 2022 Sturm, et al., 2021
A combination of conspiracy views and obtaining information from social networks and other sources that are not subject to active state regulation			Jennings, et al., 2022 Allington, et al., 2022

In the period from 2020 to 2022, the results of a considerable number of studies about the politics of vaccine hesitancy were published in Western European journals, designed, in particular, to explain the connection between vaccine hesitancy and populism and other political movements based on data from various countries in Europe and the United States (for example, Sorell and Butler, 2022; Eberl, et al., 2021.) The results of J. Kennedy's research are telling, demonstrating the existence of a significant statistically significant relationship between the number of votes that populist political parties gain and the degree of public doubt about the importance ($R = 0.7923$, $P = 0.007$) and effectiveness ($R = 0.7222$, $P = 0.0035$) of vaccination (Kennedy, 2019).

With this in mind, Ya.-M. Eberl, R. Huber, and E. Groising suggested that “the complex nature of the COVID-19 pandemic makes it an ideal platform for populist opposition to scientific and political elites” (Eberl, et al., 2021, p. 272). In order to test this hypothesis, the researchers used the case of Austria, where mainstream parties are actively opposed by (at least one) populist party. The study defines “belief in conspiracy theories” as “the belief that authorities can be malicious, that they can cover up crimes, and that official explanations for major events can be lies” (Sutton, et al., 2014, p.256). In order to find out the extent to which respondents share conspiracy ideas, they were asked to express their attitude to a number of statements about the coronavirus (including those statements that are most prevalent in the context of conspiracy theories about the nature of the virus and the vaccination campaign against it):

1. A vaccine against the coronavirus was developed a long time ago, but big pharmaceutical companies deliberately hid the results of the research.
2. A vaccine against the coronavirus was developed a long time ago, but the government is deliberately slowing down the vaccination process.
3. The coronavirus vaccine is still under development, and there are test vaccines on the market that are unsafe to use because the clinical research process has not been completed.
4. The coronavirus is a biological weapon that was designed specifically to harm humans.
5. The coronavirus is a natural infectious disease that has spread throughout the world and caused a pandemic.
6. The coronavirus was accidentally “released” during a military experiment under the auspices of the United States
7. Bill Gates wants to forcibly vaccinate the world in order to make a lot of money.
8. New 5G signal towers are the source of the spread of the coronavirus

The results of the analysis confirmed that individuals with more developed populist beliefs are more likely to believe in conspiracy theories (Eberl, et al., 2021, p. 277). Analyzing the causal relationships between populist views (e.g., formulated in statements 1-3 above) and conspiracy ideas regarding the coronavirus and vaccination (statements 2, 4, 6-8), the authors determined that a key factor linking these groups of views, is a lack of trust in political and scientific institutions (Eberl, et al., 2021, p. 278). Thus, populism is negatively correlated with trust in the government and parliament. Trust in these political institutions, in turn, is negatively correlated with the likelihood that an individual will share belief in conspiracy theories related to COVID-19. To put this view in other words, trust in political institutions itself, which is central to mitigating and communicating information about the risks of COVID-19 and the benefits of vaccination, reduces the likelihood of conspiracy sentiment. Secondly, an important result of the study is to determine the correlation between a high level of populist views and low trust in science, which, in turn, leads to distrust in the communication of scientific information about COVID-19 and vaccination (Eberl, et al., 2021, p. 279).

Lack of trust in institutions, elites, and experts has been identified as a key factor linking vaccine hesitancy and populism in several other studies, both within individual countries and

using data from different countries and contexts. An example of the second type of research is, in particular, the work of a group of Spanish researchers Almudena Rezio-Roman, Manuel Rezio-Menendez and María-Victoria Roman-González, which uses data from surveys that were conducted in 2020-2021 in all EU countries and Great Britain (Recio-Roman, et al., 2021). In contrast to the study of the group of Jacob-Moritz Eberl, the study of the group of Spanish scientists took into account not only the factor of populism and distrust of the authorities, but also the belief about the insufficient effectiveness of vaccines. Analysis of the factors of populism, lack of trust in institutions, and the perception of vaccines as insufficiently useful allowed the authors to distinguish five clusters of countries with different ratios of the above categories (Recio-Roman, et al., 2021). For example, France, Britain, Spain, Greece, Romania, Bulgaria and Croatia all scored equally high in the categories of populism, mistrust and disinterest. Respondents from Germany, Portugal, Belgium and Hungary have moderately populist views and a level of mistrust that can be rated as medium between moderate and low, while the category of lack of trust in the benefits of vaccines was not statistically significant. Three countries have the lowest indicators simultaneously in all three categories: Austria, Luxembourg and Ireland. Thus, the study showed a closer relationship between vaccine hesitancy, on the one hand, and populism and lack of trust, on the other, while the factor of perception of the lack of benefits of vaccines was not statistically significant in many cases (Recio-Roman, et al ., 2021). According to the results of the study, the authors separately emphasize that the issue of vaccination offers populist parties fertile ground for “provoking doubts and trying to benefit from the polarization of the debate” (Recio-Roman, et al., 2021).

What is interesting in this context is that populists try to combine the sentiments of vaccine opponents with a number of other populist sentiments, in particular, anti-pharmaceutical, anti-scientific, anti-migration, anti-government, which is particularly noticeable in the communication of populists (Recio-Roman, et al., 2021; Broniatowski , et al., 2018). As Broniatowski, et al (2018) demonstrates, anti-vaccination debates are often facilitated by “bots” (accounts with automatic content generation) and “trolls” (users who specifically provoke intense debate and emotionally shake up panelists). The use of “bots” and “trolls” » for the promotion of certain narratives and the combination of populist sentiments of a different nature testify to the strategic use by populists of the topic of the harm of vaccines and vaccination to undermine public trust in institutions (Broniatowski, et al, 2018). Analyzing the communications of the leaders of European populist parties, the author of the term “medical populism” Gideon Lasco identifies a number of special characteristics of this communication or, in other words, the means characteristic of populist narratives about vaccines. It is, in particular, an attempt to simplify the topic of the pandemic, including rhetorically downplaying the virulence or severity of the outbreak and offering “quick and effective solutions” to the virus, such as the use of analgesics or other widely available drugs. On the other hand, certain populist politicians, particularly those in power at the time of the pandemic, deliberately dramatized the crisis and the uniqueness of the threat posed by the pandemic in order to obtain emergency powers (Lasco, 2022). Along with the opposite, at first glance, methods of simplifying and dramatizing the threat (which can be used at the same time to provoke uncertainty), populists actively use the tactics of polarization and “formation of splits”, when wide circles of the population turn against “others”, “power elites”, that is, pharmaceutical companies, supranational institutions or, more generally, the “medical establishment” (Lasco, 2022). At the same time, by combining vaccination

narratives with other sentiments directed against “dangerous others” (such as migrants or refugees), populist communication undermines trust in a wide range of institutions and norms. To strengthen this effect and undermine trust, in particular, in proposals and ways to overcome the crisis (restrictions, vaccinations), populists use arguments against knowledge or facts, for example, about the artificial origin of the virus (Lasco, 2022).

Turning to studies with a specific country focus, it is worth noting that they also mostly confirm the link between negative attitudes and populism, which includes, in particular, a lack of trust in a wide range of institutions and norms, as well as the prominent role of (social) media in spreading opposition to vaccination (Jennings, et al., 2021; Holzmann-Littig, et al., 2021; Fobiwe, 2022; Fisk, 2021). A study by a group of British scientists led by Will Jennings demonstrates that trust is a key factor in an individual's decision to vaccinate (Jennings, et al., 2021). At the same time, according to a survey of 1,476 adult British citizens and the results of five focus groups, both (dis)trust in vaccines in general and (dis)trust in the government are important. Since the survey also included a question about the sources from which respondents get information about vaccines, the study concludes that there is a positive correlation between the consumption of information from unverified sources and mistrust of vaccines (Jennings, et al., 2021). A similar conclusion regarding the role of the sources from which a person receives information in determining his/her attitude towards vaccines is made by the group of the German researcher Christopher Holzmann-Littig, who studied vaccine acceptance and indecisiveness about vaccination among German health care workers (Holzmann-Littig, et al., 2021). It is noteworthy that, as in the case of the general population without medical education, health care workers who indicated that they received information about the virus and vaccination from messengers and video hosting services showed stronger vaccine hesitancy compared to those who received information from official sources. At the same time, individuals who received information from social networks, instant messengers and video hosting showed lower scores in tests of knowledge of facts about the coronavirus and vaccination compared to medical professionals who used official sources. Like most other studies, Holtzman-Littig's group found that the main factors behind indecision about vaccination were a lack of trust in the authorities and pharmaceutical companies, which were perceived by respondents as representatives of a certain establishment (Holzmann-Littig, et al., 2021).

A similar conclusion is drawn by a mixed group of German and British researchers led by John-Paul Fobiwe, arguing that trust in institutions and democracy is the main factor that prompts individuals to vaccinate (Fobiwe, et al., 2022). Like the study by the Holtzmann-Littig group, the work by John-Paul Fobiwe and his colleagues is based on a survey of German adults. Along with identifying the key role of institutional trust in the success of the vaccine campaign, scientists have noted a significant relationship between receipt of the influenza vaccine and the COVID-19 vaccine (Fobiwe, et al., 2022). Therefore, according to the group of John-Paul Fobiwe, vaccination programs against both COVID-19 and other diseases must be accompanied by active communication campaigns in social media, designed not only to explain the danger of the virus and the need for vaccination, but also to gradually develop trust population to institutions. Unlike the other studies discussed above, the American researcher examines the problem of the low level of vaccination of the population in the United States through the lens of two types of barriers: structural and related to the population's attitude to certain phenomena (Fisk, 2021). Among the structural

barriers that affect vaccination, Fisk notes cost (the price of the vaccine or the visit to the doctor that is necessary to get the vaccine); convenience (time required to register and receive vaccine, geographic proximity of vaccination sites) and issues related to supply chains (Fisk, 2021). As for the second group of barriers, factors of lack of trust in institutions, misinformation and lack of knowledge about vaccines and vaccination recommendations play a key role in it. It is also worth noting that, unlike other studies, the Fisk survey allowed us to single out a wide range of private and public institutions, distrust of which is a barrier to vaccination. Yes, it's not just private pharmaceutical companies that develop vaccines and government agencies in general, but also regulatory agencies that oversee vaccine development and distribution, health care workers, and international organizations involved in vaccination promotion (Fisk, 2021, p.51-55).

Alongside the question regarding the relationship between vaccine hesitancy and populism, and the role of (dis)trust in institutions in this context, the literature review would not be complete without reviewing recent works that focus on the relationship between vaccine hesitancy and specific political ideologies. According to Berta Baumgartner and her colleagues, whose work was published a year before the COVID-19 pandemic, risk and its perception by individuals is a key factor that determines the politicization of vaccination issues (Baumgartner, et al., 2018). After considering the case of influenza vaccination in the USA, Baumgartner and her colleagues conclude that there is a direct relationship between vaccination attitudes and political views. For example, conservative respondents are less likely to show a positive attitude toward vaccines in general, and toward flu vaccines in particular. As with the phenomenon of populism as such, the factor of an individual's attachment to a certain political ideology is related to trust in the government and government medical experts (Baumgartner, et al., 2018).

A study by German scientists Mark Debus and Yale Tosun in connection with the COVID-19 pandemic and vaccination against the coronavirus comes to an interesting conclusion, which shows the connection between ideological extremism on both sides of the political spectrum and vaccine hesitancy (Debus and Tosun, 2021). Based on the survey and analysis of its results, the authors conclude that to increase the success of vaccination, politicians should try to form broad alliances between parties or social groups in order to increase trust in vaccines in general and vaccines against COVID-19 in particular, since the latter was developed in a very short period of time, resulting in a low level of confidence, particularly regarding the effectiveness and possible side effects of new vaccines (Debus and Tosun, 2021). At the same time, a study of a large body of Twitter data related to COVID-19 supports the finding of Baumgartner and colleagues regarding the relationship between conservative views and vaccine hesitancy (Jiang, et al., 2021). According to this study, Twitter users with conservative views and standard Twitter audience sizes were less pro-vaccine compared to individuals with liberal views and larger audiences (Jiang, et al., 2021). It is worth noting that the results of this group's study correlate with earlier research that suggests that conservatives perceive the risks of vaccination as higher and the effectiveness as lower compared to liberal circles (e.g., Kahan, 2014). According to research by Jiang and her colleagues, conservatives' vaccine hesitancy is driven by three key factors, including fears about the side effects of vaccinations, a lack of trust in medical professionals, and broader conspiracy theories.

In contrast to these general conclusions about the relationship between ideological extremism and vaccine hesitancy, as well as between conservatism and vaccine hesitancy, a recent study by Polish scholars Michal Bilewicz and Viktor Soral offers a more detailed approach to determining the relationship between vaccine attitudes and the essence of political ideology, to which individuals show affection for. Again using public opinion polls as a research method, Bilewicz and Soral studied the attitudes toward COVID-19 vaccines among adherents of authoritarian conservatism (right-wing authoritarianism) and hierarchical conservatism (with a focus on social dominance) from three countries—Poland, Germany, and Great Britain (Bilewicz and Soral, 2021). The results of the study indicate that supporters of right-wing authoritarianism were less skeptical of vaccines compared to supporters of hierarchical conservatism. Compared to Poland, the influence of hierarchical conservatism in Germany and Britain on individuals' plans to vaccinate is stronger (Bilewicz and Soral, 2021). The authors explain this phenomenon by the fact that, despite the negative sentiment about abortion and anti-immigrant narratives, the leading Polish right-wing party Prawo i Sprawiedliwość supported vaccination in Poland (Bilewicz and Soral, 2021). As such, Bilewicz and Soral's research demonstrates that scientists should not be tempted to assume that a conservative (or a conservative right-wing party) necessarily has a commitment to vaccine hesitancy. A separate factor or strategy of a certain party can significantly affect the corresponding correlation in a specific society at a specific moment in time. The role of such a factor can be played, for example, by the level of solidarity in society and awareness of joint responsibility in the context of fighting the pandemic (Majid, et al., 2022). Also, arguing for the need to include in the analysis small groups of respondents with different combinations of background, education and views, a group of Australian and European researchers led by Matthew Hornsey showed that stronger vaccine hesitancy than conservatives can be demonstrated by liberals with higher education who also share concerns about genetically modified crops and nuclear energy, and use the Internet for scientific information (Hornsey, et al., 2022). The bias toward vaccine hesitancy among liberal circles in the US was a frequent subject of research prior to the coronavirus pandemic (Hamilton, et al., 2015). Similarly, even before the COVID-19 pandemic, people who expressed faith in the government's ability to fight epidemics were three times more likely to get vaccinated than those who doubted it—and the effect was telling on both the right and the left of the political spectrum (Mesch and Schwirian, 2015). Nevertheless, as Hamilton, Harter, and Saito emphasize, when studying liberal attitudes toward various phenomena, such as climate change or vaccine hesitancy, it is necessary to take into account existing research on the relationship between political ideology and attitudes/trust in science (Hamilton, et al., 2015). In addition, as noted by Majid, et al (2022), the determination of addictions may also be influenced by individual factors, for example, individuals' previous experience with vaccines.

In conclusion, it is worth noting that, despite the existence of studies that confirm the connection of vaccine hesitancy with conservative ideology or with ideological extremism of various directions, more in-depth studies with a smaller number of respondents may demonstrate less expected results. Nevertheless, the issue of trust in public and private institutions involved in vaccine development, distribution, and vaccination itself is a key factor influencing individuals' attitudes toward vaccines. Populist political movements, in turn, can use uncertainty about the nature of vaccines against COVID-19, as well as the rapid pace of their development, as arguments to fuel distrust of government institutions and

elites, spread conspiracy theories, and polarize society. The case of social media coverage of the COVID-19 pandemic also demonstrates the potential for populists to instrumentalize the pandemic and the vaccination campaign in order to mobilize the population against the “dangerous other” and combine different sentiments, such as vaccinators and anti-immigration. In any case, both vaccine hesitancy as a phenomenon and its politicization and combination with other sentiments pose a threat to public health. Combating this threat requires European and North American states to combine policies to combat misinformation on the Internet, increase trust in public and private institutions, and build the broadest possible political consensus around public health issues.

3. Research design and model

Based on the theoretical literature on the nature of populism, its political manifestations, and the relationship between populism and vaccine hesitancy, as well as empirical research on vaccine hesitancy in other countries, we hypothesized that **vaccine hesitant actors tend to harbor populist opinions more pronouncedly than vaccine enthusiasts**. In other words, our primary expectation was that when measuring propensity for populism representatives of the vaccine hesitancy camp would systematically have a statistically significant higher score than respondents who do not belong to this camp. This means that the first part of our study follows the *confirmatory design*. We advanced a hypothesis to which, with the help of data analysis, a clear answer can be given in the form of “this is true” or “no, the data do not indicate this.”

Typically, confirmatory design requires defining causes (*independent variables*) and effects (*dependent variables*), followed by special procedures to determine whether the variables are related, in which direction, and with which strength. In this study, populism was the independent variable, and vaccine hesitancy was the dependent variable. Our model predicted that the more the respondents lean towards political populism, the more likely they will belong to the vaccine hesitancy camp.

Confirmatory design requires accounting for the so-called *control variables*, which means introducing into the model other factors that could probably affect the results but which influence can be isolated using statistical methods to establish the influence of the independent variables more clearly. Control variables are “*usual suspects*”: they are typically thought of as plausible causes of a given process. In our case, the role of one control variable was highlighted by a *Facebook* comment under our announcement that we were starting a study of differences in the political beliefs of pro-vaccination and anti-vaccination groups. A knowledgeable user scathingly noted that “it is worth simply measuring the IQ of representatives of each camp.” From a methodological point of view, this comment contained an alternative hypothesis to the one we put forward: “it is not populism, but the IQ level that determines belonging to the camp of vaccine hesitators/supporters of vaccines.” Although the actual wording of this hypothesis contradicts our declared value-neutral approach because it unequivocally stigmatizes vaccine hesitators as having a low IQ, it was methodologically sound: whatever the results of our study, other people could point out that the results are ambiguous because we did

not take into account other important factors that lead to vaccine hesitancy. Accordingly, even during the preparatory process, we introduced several control variables (respondents' education, material status, and religious beliefs) in order to control for the type of education, level of earnings, or belonging to a certain denomination as factors that might predict the position of respondents in the debate about the vaccination viability.

In addition to the principal hypothesis, we had several less clearly defined expectations. Their study correlates with the so-called *exploratory research design*. Exploratory design changes the very nature of the question and possible ways to answer it. Whereas a confirmatory research puts forward a specific hypothesis in the form of a statement and gives a reasoned "yes/no," an exploratory research probes for a multitude of different connections, describing "how" something happens and even "whether it happens at all."

The exploratory aspect of our project aimed to single out several important, probably even watershed issues of the Ukrainian political agenda, with the aim of seeing whether pro-vaccine people and vaccine hesitators tend to nurture different attitudes toward them. Until February 2022, such questions were (1) attitude toward the European integration, (2) attitude toward NATO, and (3) evaluation of the Euromaidan. Undoubtedly, some readers of this report could suggest ways to supplement or even completely change this list significantly. For example, they might advise adding socio-economic issues such as guaranteed protection of the right to work, environmental topics, or the relationship between attitudes to vaccination and approval/condemnation of the Istanbul Convention. Probably, some would suggest checking whether vaccine hesitators are more patriotic or whether vaccine enthusiasts use Ukrainian more often in everyday life... Moreover, given the significant polarization of society during the presidential elections in 2019, why not check whether more supporters of vaccinations are among the famous 25 % who did not vote for Volodymyr Zelensky? These are fair questions because the meaning of exploratory design is to find connections that have not yet been established. At the same time, they are not relevant to our analytical focus because we wanted to study not the entire possible palette of political differences between the two camps of the vaccination discussion but possible differences between vaccine hesitators and vaccine enthusiasts, which would be associated with different levels of populism proper to the two groups. Attitudes towards Euromaidan, prospects for European integration, and deepening cooperation with NATO are not only classic markers of identity divisions in Ukraine, which allow one to comprehensively describe and, to a large extent, predict the respondent's positions on other issues (see Schmid and Myslovska, 2019). The same questions, with a certain degree of probability, can be expected to produce different answers from populists and non-populists because, as the experience of Europe and North America shows, populists usually perceive large bureaucratic institutions with greater distrust, professing Eurohesitancy and isolationism.

Any study must balance depth and breadth of explanation: too many questions to the respondent, which would allow a more nuanced description of political beliefs in all their inherent complexity, inevitably reduces the total number of completed questionnaires. For this reason, we decided to focus on the issues of European integration that are significant for the modern political debate, leaving others no less attractive for further research and other scholars. In other words, within the exploratory part of our research, we aimed to probe the possible interval between vaccine hesitators and vaccine enthusiasts in assessing

European integration processes as possible proxy variables for a broader range of identity categories.

4. Data and methodology

When conducting research, we used three types of data. First, in order to provide a general description of the organizational dimension of the vaccine hesitancy movement in Ukraine and to record the presence of populist beliefs in this community, we monitored and analyzed 30 *Facebook* pages (with an average audience of 2,100 followers) and 9 *Telegram* chats that focused on the following topics: mistrust of vaccines and the policy of quarantine restrictions. In addition, we attended several demonstrations organized by vaccine hesitators for included observation. Secondly, we conducted a series of in-depth interviews with individual vaccine hesitators because this research method allows us to nuance and contextualize the attitudes and beliefs recorded by external observation. Using the different geographical locations of the three authors of the project, we conducted in-depth interviews in Odesa, Lviv, and Kyiv; such geography made it possible to control whether the different attitudes of European integration and Euromaidan is not determined, among other things, by regional cultures and political preferences. Unfortunately, the beginning of the Russian-Ukrainian war interrupted this part of the data collection, so we collected only 12 interviews, and therefore these materials were not used so much for systematic analysis as to illustrate and strengthen individual conclusions. Ultimately, since a quantitative method and descriptive and inferential statistics principles were best suited to determine the correlation between the level of populist beliefs and vaccine hesitancy, we collected the original dataset using an extended questionnaire (32 questions) on the *QuestionPro* platform. A total of 1685 people viewed our questionnaire, of which 1178 started to fill it out and 1010 respondents completed it. In other words, 85% of people who, by their actions, signaled interest in participating in the study completed this path. We express our gratitude to all who did. After the technical work, we had to reject several incomplete copies, so the total number of responses we analyzed was 1003.

The questionnaire consisted of three thematic blocks with different functions. The first collected demographic information, which corresponded with the control variables of the project: we asked respondents to provide information about their education, religious views, and economic status. Since it could be assumed that the level of education and its area (e.g., humanities, engineering, social, or natural sciences) could correlate with populist proclivity, we purposefully collected this kind of data. The second and third questionnaire's blocks were directly related to political beliefs and populism (Content 9).

Since the purpose of the study was to investigate the differences in political beliefs of people representing the different camps of the vaccination debate, a particular question ("*I question the viability and safety of vaccines*"), located at the end, prompted the respondent to indicate his/her disposition unambiguously. Importantly, we did not ask respondents about their behavior, i.e., whether they get vaccinated. Instead, we forced respondents to choose between the mutually exclusive options of "Yes, vaccines have too many side effects" or

“No, vaccines are the best protection against disease,” purposefully prompting them to express their beliefs and perform an act of self-categorization.

This strategy, however, would be hardly effective while seizing the measure of a respondent's populist sentiments. First, the measure, as a category by definition, should have a certain scale and not simply answer the question “yes” or “no.” Second, given the stigma associated with the phenomenon of populism, the sincerity of the answers would raise doubts: few respondents would answer, “Yes, I am a populist.” Considering these two circumstances, we constructed the second part of the questionnaire differently, and in order to ensure more honest answers, we did not use the concept of populism in the description of the project at all. Our respondents believed they filled out a questionnaire that would allow us to determine the specifics of their political beliefs, e.g., attitude towards NATO or Euromaidan. The third block of questions indeed contained such questions. But the largest, the second block, was comprised of 16 statements, each of which covertly tested the extent of the respondent's inclination to populism. The theses themselves focused on the three essential characteristics of populism described above: (1) assertion of the immutability of the antagonism between the “people” and the “elites” compounded with the moralization of this confrontation, and accordingly, anti-elitism; (2) rejection of the principles of political pluralism; (3) request for the performative expression of “low style” in political processes. Respondents had to indicate how much they agree with theses, such as “*People, not politicians, should make important political decisions.*” Possible responses were arranged on a 5-point Likert scale (“Strongly disagree”\“Partially disagree”\“No opinion”\“Partially agree”\“Strongly agree”). Half of the 16 theses were inverted in order to avoid a situation where respondents would mechanically choose answers from the right side of the spectrum (“Partially agree”\“Completely agree”). Such reverse theses (e.g., “*Politicians should guide rather than follow the people*”) played the role of hidden control questions of two types: one allowed to measure the degree of elitism, and the other - the degree of pluralism of the respondents. The idea to use Likert scales to measure populism and some possible wording for the questions were inspired by the seminal article by Akkerman et al (2014). Since, according to our theoretical framework, populism, pluralism, and elitism constitute a mutually exclusive triad, in the situation of systematic responses against pluralism and elitism, we obtained additional evidence of tendencies towards populism. We also used the 5-level Likert scale when asked respondents to describe their attitude toward NATO, European integration, and Euromaidan in the questionnaire's third block.

Next, the answers to 16 scales on populism and important political preferences were coded in a numerical equivalent from 1 to 5. This provided an opportunity to measure quantitatively and compare the degree of populist beliefs. Respondents who systematically responded “partially agree” or “completely agree” obtained a higher total score than those who expressed disagreement. We were not interested in individual responses, that is, how much Respondent 106 scored on these scales as a whole or what is his\her score's mean. Instead, we looked into the correlations between belonging to the vaccine hesitancy camp and the degree of populism inherent in the group. Respondents who expressed favorable views about vaccination served as a control group: we checked whether similar dynamics in the intensity of populism were not observed among them; if this were observed, it would be evidence against our hypothesis of a causal relationship between populism and vaccine hesitancy.

We resorted to descriptive statistics (tabulation tables for establishing correlations) for statistical work with our data. Then, we applied classic methods of hypothesis testing by calculating the parameters of the probability distribution of features in pairs (Student's t-test, Mann-Whitney U-test). Finally, we conducted a regression analysis to establish the intensity and direction of the effect of populism, measured on 16 scales, on vaccine hesitancy (in this case, a binary regression was used since belonging to one of the camps is a categorical variable) and the relationship between populism and attitudes toward important political issues (in this case, logistic regression was applied). We combined all the conclusions of the analysis of the responses in the questionnaire with the results of the study of the narratives of the vaccine skeptic movement on the Internet and data from in-depth interviews.

Before discussing the results, it is worth emphasizing an important ethical feature of the study. As discussed, our questionnaire had an open and a hidden level. The need for more truthful data dictated such a structure, and the approach is often used in the social sciences. For example, researchers purposefully placed two different advertisements for volunteers to participate in a project to show how the text of the advertisement itself helps to attract different categories of the population (Carnahan and McFarland, 2007). This study was also not fully open with the participants about the project's true purpose, but it did not cause them any harm and was, therefore, acceptable from the point of view of research ethics. The same statement is true for our project. Collecting questionnaires, especially via the Internet, inevitably involves the challenge of self-selection bias because the fact that the questionnaire is filled out only by those Internet users who have decided that they want to participate in the survey, that is, a non-random sample creates the possibility of a significant difference between representatives of this group and society as such. If we had openly declared that we were studying populism, the tendency to self-selection would only have intensified, and only those who proudly accept the definition of populism would be represented among the respondents. Evidently, they would belong to an undeniable and unrepresentative minority in Ukraine. Instead, the invitation to express their political beliefs gave a chance to attract more participants with the distribution of more diverse views closer to reality.

5. Results and interpretations

At the beginning of the COVID-19 pandemic, there was a vivid discussion in social networks about quarantine restrictions and the acceptability of vaccination. As a result, the pandemic triggered the so-called infodemic, i.e., the spread of ambiguous or outright false information about the disease, its scope, and its threat. In particular, social networks became the environment for the development of the infodemic. This trend was observed globally and, therefore, could not escape Ukraine.

Actually, social networks in Ukraine play an important role as a leading channel of communication between the vaccine skeptic movement and the audience and in the communication of its members among themselves. At the time of our research (early February 2022), there were more than 30 pages with an average audience of 2,100

Using the analysis of the network of reposts between channels, we identified 7 anonymous Ukrainian channels focusing primarily on the issue of vaccination, 14 pages related to the organizations of the vaccine hesitancy movement, and 6 pages of public representatives of the movement. In addition, we analyzed 19 pages that contained textual content available for download and further analysis. Posts on social networks not only highlight the views of certain organizations or their leaders but also shape the agenda for movement advocates and ordinary vaccine hesitators. Accordingly, we decided to check whether the main groups broadcast populist views and whether they have a particular attitude to Ukraine's membership in the EU and NATO, Russian aggression, the state language, decommunization and other areas related to politics or the economy. The coding table given in Appendix 8 was used for the analysis. The analysis also allowed to visualize the network of vaccinators and the informational connection between individual organizations that play the role of nodes in it.

The life cycle of these organizations is quite heterogeneous. Some (such as “Pravi.media”) entered the public sphere in 2021, after the introduction of vaccination as a policy against the pandemic. Others (e.g., “Stop Fake Pandemic”) began to act as early as 2020, expressing disagreement with the policy of quarantine restrictions. After all, a number of organizations emerged long before the COVID-19 pandemic and positioned themselves as human rights defenders, but as the public debate on vaccination intensified, they sided with the skeptics. Such a different genesis and different life horizons probably explain the plurality of political positions, which we write about below.

Given our selection criteria, the standard features of all channels and organizations are attention to the pandemic and vaccination. It is significant that, according to our calculations, 12 out of 19 pages simultaneously broadcast populist views. All important movement actors, from which many reposts were made on other channels, include populist statements in their publications. In general, they share the view that vaccination is a self-interested policy carried out against the population's interests. Such a position is well combined with populist views, namely the accusation of elites of corruption and the imposition of harmful policies.

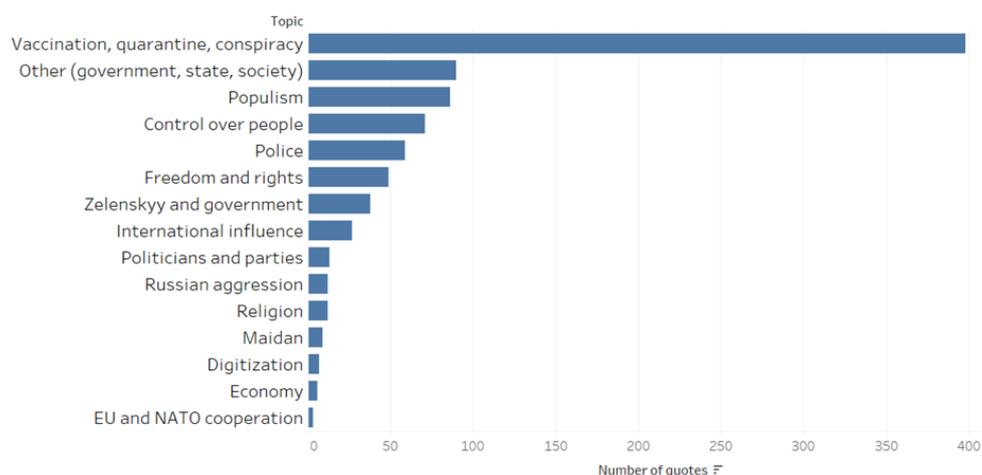
Populist beliefs on vaccine hesitancy pages manifest in the opposition of the people and political/economic elites, transnational corporations, “globalists,” etc. The elites do not just follow their own interests but “mock” or “humiliate” the people and perform “medical experiments” on them. For example, “Stop Fake Pandemic” writes: *“the people's traitors adopted bill 4142 very important for Ukraine, which actually deprived the people of their human rights, to the satisfaction of the international transnational mafia, globalists-Satanists”*.

At the same time, the posts promote a positive interpretation of the people the incarnation of Goodness. Some groups point out that the people are sovereign and periodically quote the Constitution of Ukraine. Thus, Ostap Stakhiv writes on his channel: *“At schools, teachers hand out copies of statements of consent to the processing of personal data to students [...]. The teachers forgot that we do not have a slave system, but under Art. 5 of the Constitution of Ukraine, the people are the only source of power”*. Also important is the contrast between “people's journalists” who are honest and cover the truth and “official journalists” who work for the elites.

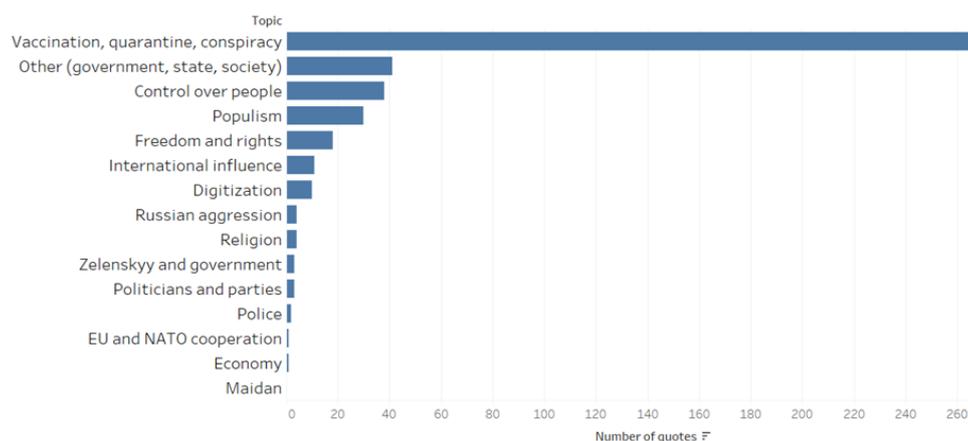
Similarly, the prevalence of populism is evidenced by the monitoring of *Telegram* chats. For analysis, we chose “Pravi.chat” (2007 participants) and “Vaccination: Free choice (community)” (2905 participants). The first chat was created by a journalist, a public critic of vaccination and the author of the “Pravi.Media” channel, Dmytro Hnap, and the second - by the public organization “Vaccination: Free choice.” The content analysis included a month of conversation (November 24 to December 24, 2022) in “Pravi.chat” and “Vaccination: Free choice (community),” which is approximately 9,300 and 6,300 messages, respectively. We analyzed the chat based on the principle of coding individual messages or their parts. Analyzing the content over one month does not allow tracing all the ideas shared by the participants and evaluating their importance, but it highlights the main trends.

Therefore, when discussing the issue of vaccination, vaccine hesitators often verbalize the division between those who have power at the international or national level and the population. Most statements reflect the division between evil elites and good people, who should be the source of power. A “Pravi.chat” participant writes: *“Name which of the existing parties in the Rada serves the people? Not one! So why do mere mortals need it then?!!!”* Significantly, vaccine hesitators tend to imagine international politics as a sphere of confrontation between governments and peoples. Governments allegedly do not fulfill the people's will and act against their interests. Thus, one member of “Pravi.chat” believes that *“authorities all over the world have declared war on people and if we bow our heads, they will most likely destroy us.”* At the same time, there is a negative attitude towards international organizations and policies of Western countries, which - according to our interpretation – are likely to represent some aspects of triple coalition the hostile to popular needs. Thus, one of the participants boasted that he *“reviewed the document in which the UN declares the adoption of a one-man rule of the world. Nation-states will be abolished...guess which armored personnel carriers are now being used to suppress insurgencies?”* In general, populist messages are represented quantitatively among the entire array of theses that will be exchanged by chat participants

Topic frequency in the chat-room "Pravi.UA"



Topic frequency in the "Vaccinatio: Free Choice" community



The content analysis also shows that fear of a triple coalition often overlaps with populists' belief in a criminal conspiracy. Some of the chat participants see vaccination as a strategy for the enrichment of multinational pharmaceutical companies, some as a disastrous medical experiment, and some even interpret the pandemic and vaccination as a way to strengthen control over people. Participants do not elaborate on the problem of control, instead generalizing it as a limitation of free choice and a veiled control of the masses. According to vaccine hesitators, actors seeking to strengthen control can be not only governments but also international organizations, transnational corporations and conditional "they." Opposition to the hostile coalition, which includes representatives of state authorities in Ukraine, becomes a rhetorical reference to constitutional human rights and freedom of speech. Expressing extreme mistrust of the political elites, chat participants point to the prospect of martial law and an increase in the budget of the army and police as a desire to control the population and suppress the speeches of dissenters. Any manifestations of state policy are interpreted in this framework. For instance, one contributor invites to *"Look at PROZORO and the special equipment the police are buying... there will be no Maidan!!! The system has prepared very well for this event!... As soon as our people start doing something like that, the authorities will immediately start a war with Russia, declare martial law and pack up all those who disagree"*.

Overall, the combined analysis (Appendix 8) shows that populism is a trait more pronounced in vaccine hesitant channels than any other political sentiment. That is why, if populist ideas are entrenched in the social networks frequented by vaccine hesitators, it is much more difficult to trace the specifics of other political views. Statements about the struggle for human rights and freedoms are common, but this does not necessarily make their spokespeople liberal; rather, such statements are the result of restrictions on the part of the state to fight the pandemic. Also, the actors of the movement show a negative attitude towards international organizations and the politics of the countries of Europe and North America, but they do not criticize Ukraine's European integration and aspirations for NATO membership. Despite the clear criticism of the decisions of the European Commission, the activities of the UN, IMF, WHO and the policies of Western countries, the organizations do not give an answer as to whether Ukraine should maintain the existing foreign policy vector of movement. The groups do not speak about Russian aggression, the state language, or decommunization. The vaccine hesitancy movement does not campaign for any position on topics that may cause controversy in public opinion.

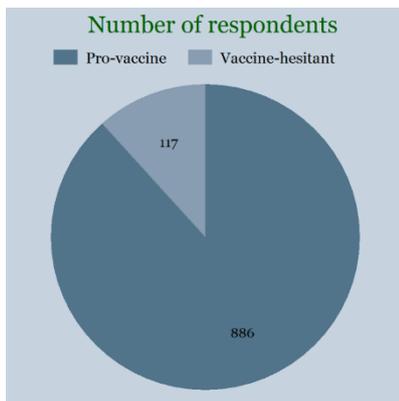
If it is possible to find posts that contain a position, for example, regarding aggression from the side of the Russian Federation, then these positions may be opposite on different pages. Views on Russian aggression were present on only 2 of the 19 channels. The author of the *Niet Maska UA* page recognized the legitimacy of Russian proxies, the so-called Luhansk and Donetsk People's Republics. On its channel, the "Bayonet of the Nation" organization honored the memory of the soldiers who took part in the Anti-Terrorist Operation against the L-DPR and the Russian military on the territory of Ukraine. Interestingly, these channels reposted each other's publications, regardless of the categorical contradiction in their views on Russian aggression. Mikiten was a member of the "Our Land" party, affiliated with the pro-Russian "Party of Regions." This did not prevent Stakhiv, who hails from a nationalist organization, from cooperating with Mikiten and organizing joint protests.

We can draw several conclusions about the views broadcast by vaccine skeptic organizations and channels on the Web:

- (1) they have pronounced populist ideas, and some organizations have even integrated vaccine hesitancy into populist ideology, which was inherent to them even before the start of the pandemic;
- (2) there is a prominent negative attitude toward international organizations amplified by the criticism of their influence on domestic decisions, which can be considered an expression of distrust in the triple coalition, which is generally characteristic of populism;
- (3) there is no unified position on current political issues, such as NATO, Euromaidan, prospects for European integration, or attitudes toward Russia. The lack of concrete or at least reconciled positions may be attributed to the diminishing relevance of other social problems, the reluctance to lose part of the audience, or the need for inter-organizational alliances in order to achieve the movement's goals. But although the interpretations of the indicated heterogeneity of views may vary, it is undeniable that supporters of the movement nurture different or even opposing political views.

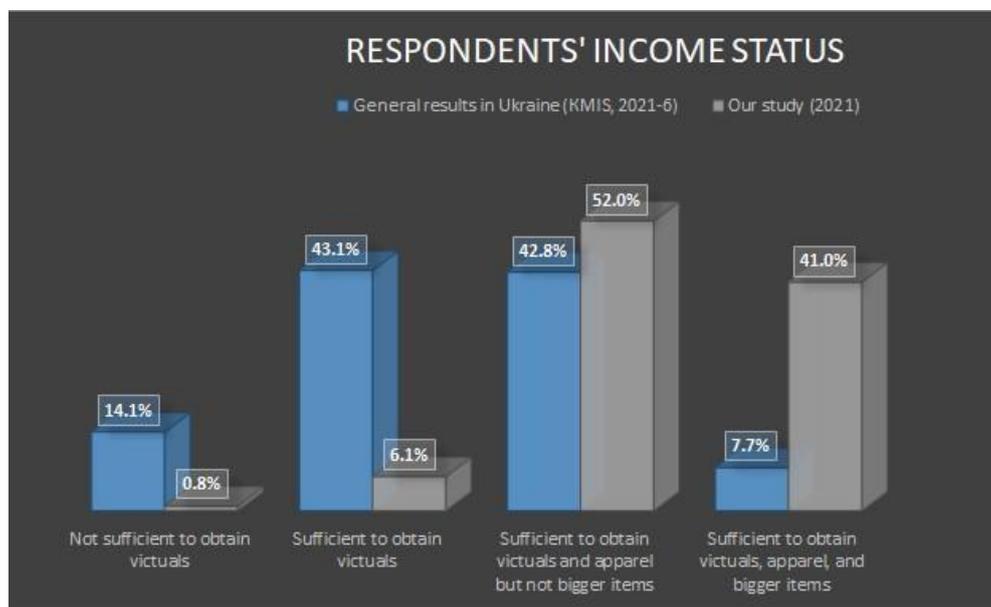
The survey analysis supplements the conclusions and insights of the social media analysis. However, several observations are necessary to nuance the interpretation of our results.

First, the distribution of our respondents suggests that, as expected, **we failed to avoid the self-selection bias**. In our survey, vaccine hesitant respondents make up 11.6% of participants. Meanwhile, general sociological surveys indicate that the number of vaccine hesitators in Ukraine is significantly higher: in April 2021, that is, at the height of the pandemic, 52.2% of Ukrainians said they were not ready to get vaccinated against COVID-19 (KMIS, 2021-a). The number is significant, but the interpretation of this data is not as clear-cut as it might seem: another 2020 survey shows that if "a new vaccine against COVID-19 became widely available and considered safe and effective", it would still *not be used by* only 30% of respondents, of which only 20% - under no circumstances (KMIS, 2020). Therefore, only one in three Ukrainians professes vaccine hesitancy, and only one in five



completely rejects vaccines as an effective way to protect against infectious diseases. Such indicators are relatively commensurate with the indicators of other countries. Thus, in Italy, 15.6% are vaccine hesitators, and 0.7% are active opponents of vaccination (Giambi et al., 2018); in Canada, 25% are vaccine hesitators (Greenberg et al., 2017), and a survey of public opinion in 18 European countries found that 56% fully accept vaccines, but another 24% signaled that they had “some reservations about vaccinations” (Hadjipanayis et al., 2020).

Second, **the gap between the sample and the general population was neither unexpected nor detrimental to the study.** Since we collected the questionnaires via the Internet, we expected that the respondents would be active Internet users with the characteristics inherent in this group - a higher level of interpersonal care and acute attention to health-related issues. Significantly, there are more women in our sample (68%) than is typical of the demographic pyramid in Ukraine (about 53% of women) because women are more sensitive to healthcare issues and participate more actively in surveys. Also, people who identify themselves as atheists are overrepresented in the sample (34.5%), while general surveys show the number of atheist respondents at the level of 4.3% (KMIS, 2019) - 5.6% (Razumkov Center, 2020). After all, as further evidenced by the comparison of self-reported economic status, our survey was primarily filled by affluent middle- and upper-middle-class respondents, while we failed to engage low-income people.

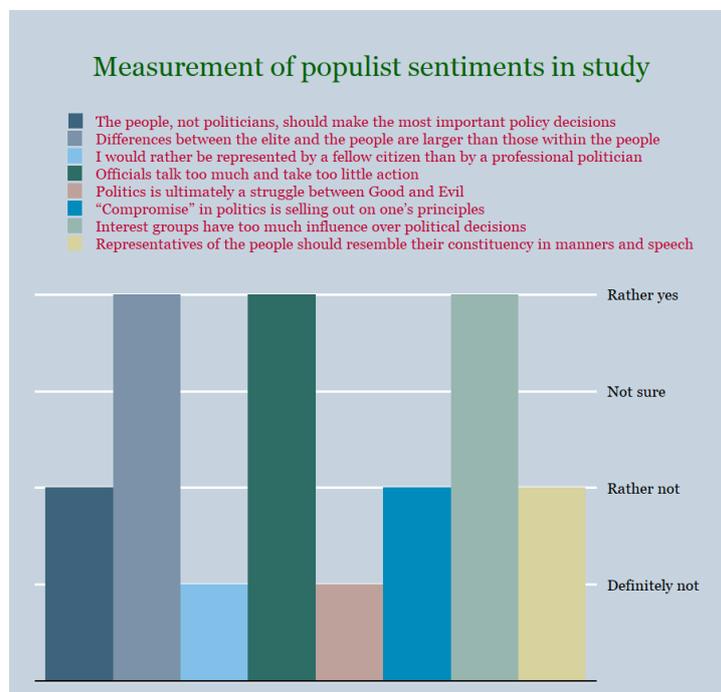


Such deviations from the general population are undoubtedly the consequences of self-selection bias and the search for respondents in our social circles. We were aware of this and took concrete steps to expand the reservoir of potential respondents from outside our communication circles: we attended vaccine hesitators mass rallies and asked participants to fill out a questionnaire; we circulated an invitation to take the survey within the vaccine skeptic community; and after each interview, we asked our respondents to spread information about the research among like-minded people. Unfortunately, Russia's full-scale

invasion of Ukraine on February 24 cut short our attempts to match our sample and the general population more evenly.

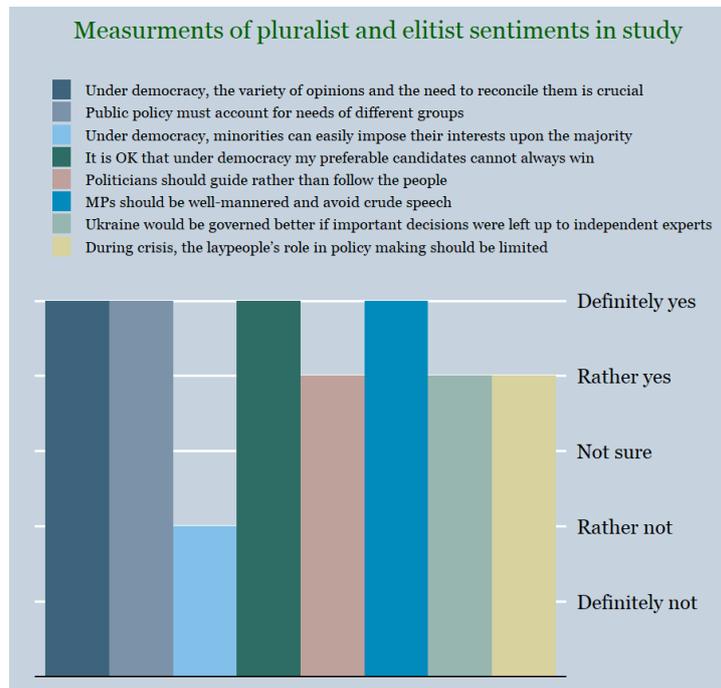
At the same time, the study aimed not to describe the general level of vaccine hesitancy in Ukraine but to trace the gap in the propensity for populism between vaccine enthusiasts and vaccine hesitators. That is why the specificity of our sample did not have a crucial influence on the results: if such a gap is observed among active and conscious Internet users who are ready to discuss their beliefs, it will already serve as a convincing demonstration of differences between the two groups. And these differences are likely to increase if representatives of more diverse social groups participated in the survey.

As the results show, vaccine hesitators have a higher level of populist attitudes even within our sample. Data on preferences generally suggest that on most of the scales we designed, respondents hold anti-populist beliefs: they doubt that political decision-making should be delegated to the people, that political compromises are evidence of unresolute protection of essential principles, or that MPs as political representatives of the people should also reproduce its cultural features. Moreover, the respondents strongly rejected the moralization of politics – i.e., the populist concept of politics as the struggle between good and evil. Similarly, there were doubts regarding another ordinary citizen's ability to better represent the political interests of the community than professional politicians do. In other words, the respondents did not demonize the political elites or idealize the people, as the ideological approach to understanding populism suggests. Nor did they have the expectations attributed to populists by the sociocultural approach.



On the contrary, our respondents strongly favor a pluralistic understanding of politics and are even inclined toward elitism. For instance, they expressed absolute agreement with all theses that measured pluralism; besides, they rejected the statement that under democracy, ethnic, religious, cultural, or political minorities can easily impose their will on the general public. This statement served as a control reversed scale: the *more* the respondents agreed with the statement, the *lower* the inclination to political pluralism. Therefore, the recorded

score is congruent with results on other scales. Similarly, the respondents showed demonstrably elitist views: they expected politicians or technocrats to determine political processes rather than passively follow the people's demands, and they revealingly supported the need to reduce the influence of ordinary citizens on public policy during a crisis. Both statements are contrarian to the populist interpretation of the role of the people in politics being proper to elitism. Elitism is also evidenced by the very eloquent request that the deputies behave decently and have a high culture of speech, not reflecting the rudeness inherent in the people's manners and speech.

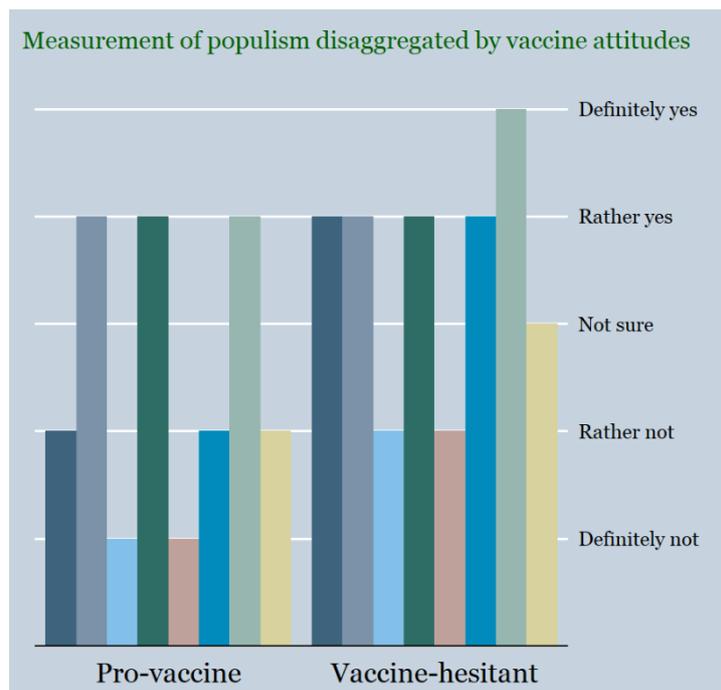


So, in general, our study's sample clearly represents the values, expectations, and beliefs of educated members of the middle classes, who, due to their upbringing, microculture, status, and saturation with the dominant liberal discourse, profess pluralistic or elitist views. They gravitate toward the populist part of the triad exclusively when (1) negatively evaluating performative qualities of Ukrainian politics (since middle-classes agree that politicians could do more) and (2) voicing concerns with the political role of the ultra-wealthy oligarchy, whom the middle classes consider as bears of special interest. This attitude has been proper to the middle classes throughout history under a democratic system, as examples of ancient Rome, the Italian city-republics, or even the contemporary USA illustrate. Such opinion logically correlates with the specified points where the views of the polled audience lean toward populist ideology. In general, the middle classes harbor a mixture of pluralistic ideals that will lead to the growth of their material and symbolic status. They also consider themselves the bearers of the best qualities (hence elitism). At the same time, they are unwilling to cede political influence neither to the "simple" and "ignorant" people (hence the rejection of the indicators of populism conceptualized by the sociocultural approach) nor to the most affluent social segments (hence the acute experience of the gap between this prominent elite and the people, among whom the middle classes do count themselves).

Had our research aimed to offer a sociological portrait of the Ukrainian community or even to measure the propensity of this community to populism, we would have failed the task

because the experience and expectations of the middle classes cannot be representative of all Ukrainians. But since we sought to determine whether populist attitudes are associated with vaccine hesitancy, the experience of the middle classes may serve as a good indicator.

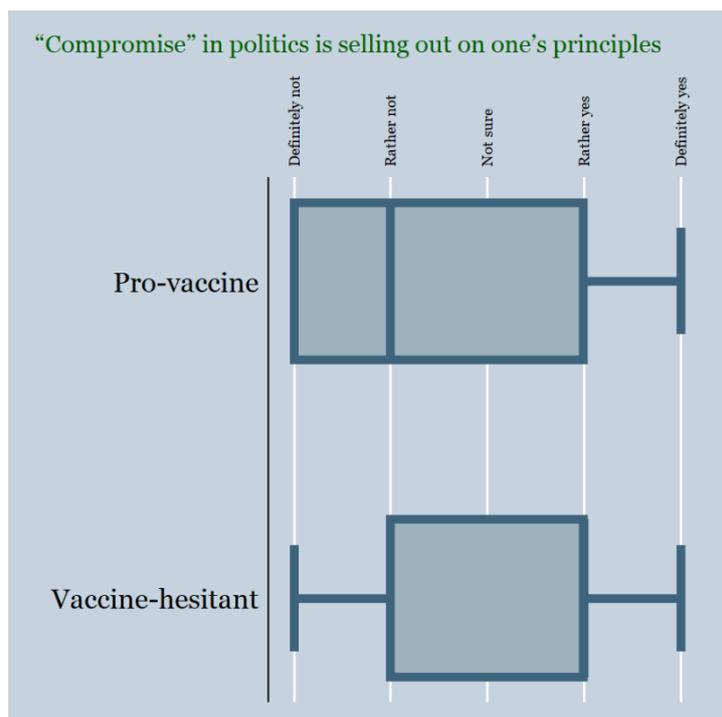
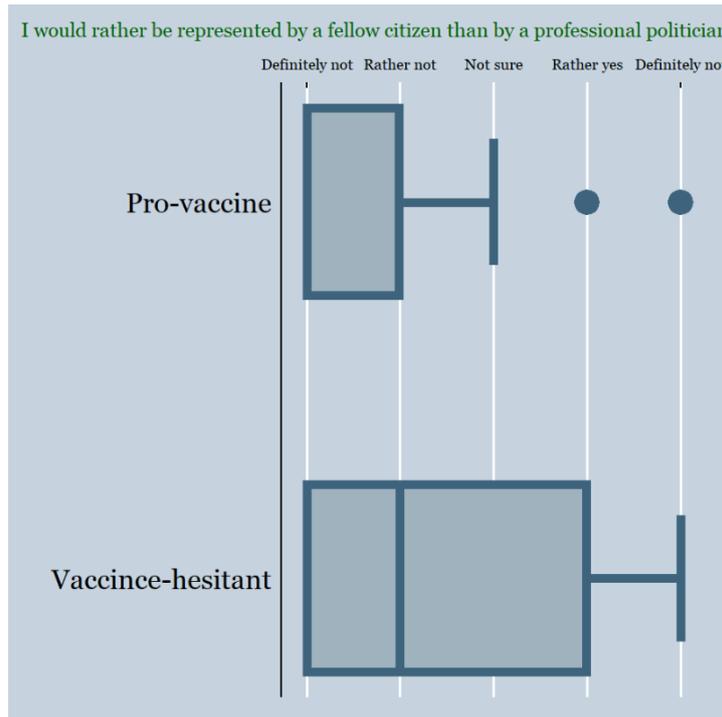
When we disaggregated, that is, distributed measures of propensity to populism controlling for vaccine hesitancy, we got telling results: in fact, on each of the eight scales that measure the intensity of populist beliefs, vaccine hesitators scored higher. The gap in the expectation that the people themselves should make important political decisions (vaccine enthusiasts did not have such an expectation) and a similar surge in the condemnation of political compromises are indicative. In addition, there is a revealing growth in the belief that the bearers of special interests excessively influence political decisions and a transition from rejection to a neutral attitude concerning the statement that politicians should reflect the socio-cultural patterns of folk behavior. As it turns out, vaccine hesitant respondents only reject the moral interpretation of politics and the representative potential of ordinary citizens (but with significantly less determination than vaccine enthusiasts). However, when we consider the lack of changes in only two other questions - namely, the negative evaluation of the performativity of home politicians and the experience of a chasm between the people and the elites - the last four results should be interpreted as indicators of belonging to the middle classes. But overall, the disaggregation clearly indicated a higher propensity of vaccine hesitators to populism.

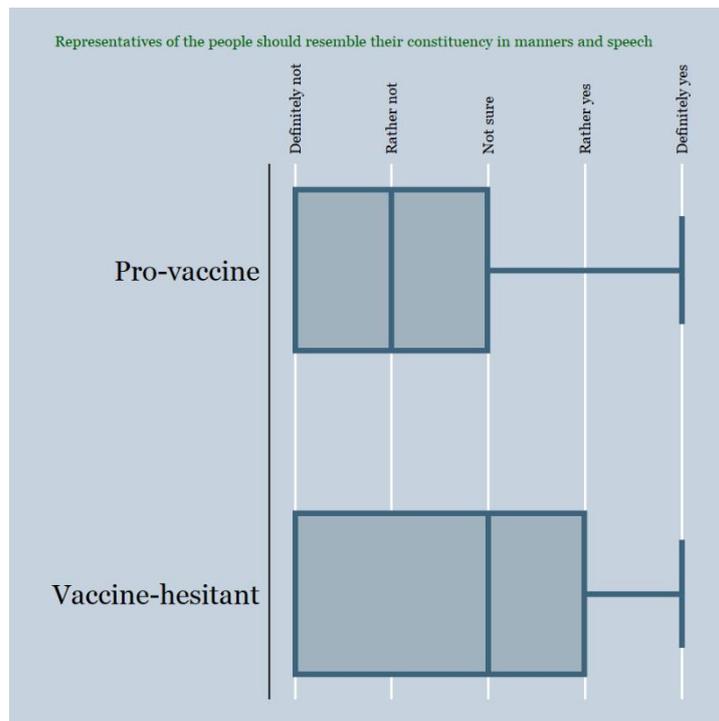


The next step was to establish whether the signaled shift in the intensity of populist sentiments has statistical significance. For this purpose, we conducted a classic Student's t-test to determine whether the difference in the average values for the two categories is statistically significant (see Appendix 1-a and 1-c). Since some statisticians suggest that for studies with a large number of observations (which also applies to our case because our N of study equals 1003), it is more appropriate to measure the z-criterion, we additionally conducted this test (see Appendix 2-a and 2-c). In both cases, the analysis showed that the indicated difference in average values was statistically significant for all eight questions

(POP1-POP8) that measured populism. Hence, vaccine hesitant respondents regularly and non-randomly scored higher on each scale.

This difference is most significant for the POP3 statement: *“I would rather be represented by a fellow citizen than by a professional politician,”* POP6: *“Compromise’ in politics is selling out on one’s principles”* and POP8: *“Representatives of the people should resemble their constituency in manners and speech.”* The three statements correspond with the stipulation of moral antagonism of the people and elites, anti-pluralism, and socio-cultural expectations of populist actors, respectively. Therefore, our model managed to capture all three characteristics successfully.





On the other hand, our control scales that measured pluralism and elitism showed less robust results: for scales other than PLU3: “*Under democracy, minorities can easily impose their interests upon the majority,*” PLU4: “*It is OK that under democracy my preferable candidates cannot always win.,* and E4: “*During a crisis, the laypeople’s role in policy making should be as limited as possible,*” the results of t-tests and z-tests were negative, that is, the change in indicators cannot be unequivocally considered as depending on affiliation to the category of vaccine enthusiasts or vaccine hesitators. However, taken together, our results suggest that we established three measures of populism, two measures of pluralism – one direct (PLU4) and one reverse (PLU3) – and one measure of elitism, which, when combined, predicted respondents' likelihood to belong to the vaccine hesitant camp. It means a person who doubts representative institutions and believes that ordinary people should articulate communal political interests; a person who does not believe in the expediency and acceptability of political compromises; a person who expects deputies to speak and dress like ordinary people; who worries that minorities in democratic systems can easily impose their will on the general public; who rejects the principle of democratic rotation and seeks the total dominance of “his/her” political forces; and who opposes the minimization of the influence of ordinary citizens on political decisions under any circumstances - such a person is not only a citizen who professes populist ideals but also with greater probability will doubt the expediency and effectiveness of vaccination.

The next step was to check whether belonging to the camp of vaccine hesitators could depend on the respondents' material status, religious views, or education. After all, explanations for why people might question the viability of vaccination may be non-populist. For example, in the case of poor people who cannot afford vaccines not included in the mandatory calendar and not covered by the state (for example, the seasonal flu vaccine), a psychological compensation mechanism can work: “it is not that the dose of the vaccine is too expensive, I just do not need it, because it does not work anyway.” Once such a skeptical attitude toward vaccines emerges, it might spread from optional to mandatory vaccinations. Or maybe people with a lower level of education do not realize the benefits of vaccination

because they have never been exposed to the proper knowledge. Moreover, while conceiving the survey, we also allowed that professional education could act as a control variable because natural scientists are likely to understand the mechanism of artificial immunity better than, for example, social scientists, and, therefore, the former tend to have more confidence in vaccinations. In addition, the plausible relationship between religion and vaccination is rather complex: the Pope officially encourages the faithful to vaccinate, while traditionalist Muslims in Afghanistan consider it unacceptable. Nevertheless, one might expect atheists with a mechanistic view of the world to espouse vaccination more eagerly than at least some groups of believers. Finally, since in Ukrainian society, women are still more often involved in raising children and making everyday healthcare decisions, females bear the burden of resolving how to protect infants' health. As a result, women study the situation with vaccinations more thoroughly (via the Internet or acquaintances), read more about vaccinations, and therefore are more likely to come across information criticizing vaccinations. Moreover, there are examples when the women's rights movement evolved into a vaccine hesitancy social movement (see Conis, 2021). So, might gender be a factor in vaccine enthusiasm or vaccine hesitancy in this indirect way? The given list of possible lines of intersection of various demographic characteristics with attitudes to vaccination is not - and should not be - exhaustive within the scope of this study. What is essential is that the control variables relate in one way or another to education, worldviews, and economic status.

All of our control variables are categorical. In contrast to quantitative measurements, they cannot be systematically measured and compared: if 6 is three times 2, nothing allows us to understand how much a Master's degree is higher than a school certificate, except that it is simply higher. To work with categorical data, t- or z-tests are unsuitable, so we used the method recommended in this case: chi-squares. This method allows us to establish whether belonging to a particular category (e.g., level of education) correlates with belonging to another category (vaccine hesitancy). Modern statistical programs allow the determination of randomness (p) and the strength of association (effect size, measured as Cramér's V) in a studied pair.

We applied the chi-square method to test the association level between the control and dependent variables. The results were negative in all cases (see Appendix 3). Comparing the two camps in the vaccine debate, categories such as gender, economic status, education, and religious views have Cramér's V scores of 0.08, 0.11, 0.12, and 0.21, respectively. This means a very weak relation without sufficient explanatory power, obviously mediated by other factors and circumstances. In other words, good education and wealth do not necessarily mean a positive perception of vaccines. The situation in other countries confirms these conclusions. Thus, in the USA, one of the highest levels of vaccine hesitancy is observed in California counties populated by wealthy and educated people (McNutt et al., 2015), and in New Zealand, the stronghold of vaccine hesitancy is the affluent Auckland (Corlett and McClure, 2022). The profession category apparently has a strong connection, but this interpretation must be ruled out because the randomness rate significantly exceeds the permissible limits ($p = 0.55$). Thus, since the control variables do not affect where respondents stand on the vaccination debate, this provides further evidence that the intensity of populist sentiment plays a more prominent role in vaccine hesitancy than education, religion, or wealth.

So, it is time to formulate the first important conclusion: **citizens who have openly or latently negative attitudes towards the principles of liberal pluralism and imagine politics as a sphere of eternal confrontation between corrupt elites and good people, i.e., populists by conviction, are more likely to question the truthfulness and relevance of requests to vaccinate.** We should especially expect opposition to vaccination if it is called for by representatives of the medical establishment, personified at the national level by the Ministry of Health and individual doctors, and at the international level by the WHO. Attempts to change the attitude towards vaccines will also be counterproductive, either through coercion (because it will be interpreted as tricks of political elites) or through a mass PR campaign involving prominent intellectuals (because they will be considered representatives of cultural elites).

Having established the causal relationship between populism and vaccine hesitancy, we tried to measure its strength. For this purpose, binomial regression analysis was the most appropriate because our dependent variable is categorical, which can take on two values (absence or presence of the respondent's vaccine hesitancy attitudes). Although t-tests indicated that the six scales of our questionnaire (POP3, POP6, POP8, PLU3, PLU4, and E4) as the best predictors that a respondent should be dubious about vaccines, we started with a typical step: we ran regression analysis with all variables, so that later, gradually removing the least statistically significant ones to obtain a more robust model.

The result of regression analysis of the entire model revealed several statistically irrelevant variables (see Appendix 4-a), so by stepwise removing redundant variables and repeatedly changing the components, we finally obtained a modified model that best fits the available data (see Appendix 4-c). The post-analysis of the model (goodness-of-fit, see Appendix 4-c) shows its statistical validity because it correctly predicted 82% of all cases, which allows us to move on to the interpretation of the results.

The results of the binomial regression analysis show: that when evaluating the statement "*my political interests would be better represented by another citizen than a professional politician*" respondent A says, "I do not know," whereas respondent B says, "rather yes" (that is, there is an increase of 1 point on the scale of populist beliefs), the odds that Respondent B doubts the viability of vaccination increases by 1.16 times (in other words by about 16%). Similarly, if the respondent strongly rejects political compromises, the likelihood of vaccine hesitancy also increases by 1.16 times. Similarly, a more pronounced expectation that politicians should perform sociocultural representation of the people raises the same likelihood by 1.15 times. However, the most potent link between populism and vaccine hesitancy is distrust in the ability of democratic institutions to effectively resist capture by minority groups (+27%). Conversely, if a respondent has a more precise understanding that democracy as a set of institutional rules involves the inevitable rotation of power and never rules out a victory of political opponents, this *reduces* the chances that this respondent is a vaccine skeptic by about 23%. All signaled increases are incremental: the probability that Respondent C, who "fully agrees" that "*political compromise is a betrayal of ideals*," at the same time doubts it is advisable to vaccinate is three times higher (+32%) than for Respondent A who does not have a clear position regarding this issue (an increase of 2 points on the scale of populist beliefs).

In general, the regression analysis results show that the respondents' populism allows us to predict their position on the vaccination issue with a certain degree of likelihood. In other words, there is a cause-and-effect relationship. At the same time, we should note that the *pseudo-R-square* for our model is only 6%. It means that the model describes only a small proportion of all possible factors that make a person question the feasibility, acceptability, and effectiveness of vaccinations. In our opinion, the relatively low *pseudo-R-square* is not a bug but a feature: humans are complex and unpredictable actors, and an individual's views are an accumulation of experience, calculations, emotional attitudes, cognitive biases, and the influence of our social environment. Accordingly, people come to espouse vaccine hesitancy views under the influence of a wide array of factors.

To illustrate the differences in experience, here are three quotes from the in-depth interviews we collected. For example, one of the respondents, a mother of three children, said:



For the first time, I began to doubt the viability of vaccination when I had children. Actually, I gave my first child all the vaccinations until she was three years old, but she grew up very sickly - she constantly had a runny nose, sore throat[...] Then a doctor told me that children should, first of all, acquire natural immunity - it is stronger and lasts longer, and protects better[...] So, I began to be interested in the issue, read about it, talk to other parents - then there was no Internet or Google, so they brought me books on CDs. So, my motherly intuition told me that vaccines are of dubious value, and then I started looking for information with eminent scientists - and my guess was confirmed. Eventually, I did not vaccinate the second and third children.



This experience - the experience of caring for a sick child, the gradual emergence of doubts under the influence of a friendly doctor, communication in a group of like-minded people, and the gradual strengthening of beliefs due to *confirmation bias* - has little in common with the path of the other respondent, driven by the ethos of individual choice and private autonomy:



I don't need vaccines, no way. It was done in childhood, but no one asked whether you wanted it or not, and the children are at such an age that they do not consciously choose whether they need it or not. Their parents make decisions for them. And this choice, when something is done to you, imposed on you, and you do not agree with it at a conscious age, creates a conflict.



And, after all, the above two cases do not at all resemble a built-in professional self-confidence, slightly masked by concern for the weak, antipathy to vaccines as a manifestation of a deep-seated rejection:



I have worked in a hospital all my life; viruses, of course, have always been there. But if the immunity is normal and there are no concomitant diseases, there is no need to strain the immune system just like that. That is why I am against vaccines. I even had to do my best to work without vaccination. Who should I leave my patients to?



These are just three small illustrations that put the findings of the quantitative analysis into a necessary perspective: **vaccine hesitancy cannot be attributed solely to the measure of populist demands the citizens nurture with regard to the political process. But, on the other hand, populism is undoubtedly one of the components of the world view of vaccine hesitators.**

Continuing our work with data, we carried out a correlation analysis (see Appendix 5) of the critical indicators of populism, which revealed additional patterns. Thus, respondents with more decisive views on the pointlessness of institutional representation strongly condemn political compromises ($r=0.232$) and foster a more intense demand for socio-cultural representation of the people ($r=0.237$). And the apprehension that minorities could impose their interests on the agenda is growing along with mistrust of political compromises ($r=0.128$). This juxtaposition makes sense: **a person who believes that democracy by its institutional design is too vulnerable to the pernicious influence of small but persistent pressure groups expects that “correct”, i.e., popular, politicians will have clear visual markers of their pro-popular position - language, clothing, culinary preferences, and household habits.** Visual or verbal identification is a straightforward tool for differentiating those who should be supported and those who should not because language and clothing indicate whether this politician belongs to the people. And any compromises, even when practiced by such openly “our” politicians, are interpreted by such an individual as a signal of the hidden influence of sinister minorities. This mindset, under appropriate circumstances, makes their bearer more sensitive to messages that undermine the necessity to vaccinate.

The confirmatory design of our study allowed us to corroborate the existence of a statistically significant causal relationship between the intensity of populist beliefs and the vaccinosis-skeptic views of the respondents. But what about the broader range of views on political processes that we set out to address in the exploratory design?

The main distinguishing criterion (or treatment factor) in our study is precisely the vaccine hesitancy of the respondents. However, there are no theoretical or empirical grounds to believe that an individual's views on vaccination are decisive for his/her nuanced political preferences. If this were the case, a general analysis of the movement of vaccine hesitators in Ukraine (see the previous section) would reveal the presence of a clear political position,

steps towards institutionalization, or even an Anti-vaccination party. In other words, the issue of opposition to vaccines would be an essential factor not for social but political mobilization. There would be not only social movements resorting to contentious politics and opposition to the mandatory vaccination program but also a political movement with a program of a new state policy of reducing requirements and greater tolerance for alternative methods of immunity formation. There is currently no such political movement precisely because there is no causal relationship between the view on vaccines and political preferences.

Consequently, we cannot conduct regression analysis using vaccine hesitancy as an independent variable and attitudes toward Euromaidan, European integration, and NATO as dependent variables. Any observed correlation would be attributed to the genuine cause-and-effect relationship between populism as a component of a political worldview and the perception of a non-violent revolution, the advantages and disadvantages of European integration processes, and the practicability of a defense alliance. Academic literature clearly indicates the probability of such a cause-and-effect relationship: populists in European countries distrust any international unions and reject supranational bodies as too detached from the population's needs. The interpretation of popular protests and revolutions is more complicated. However, in Ukrainian realities, where neither the Orange Revolution of 2004 nor the Euromaidan of 2014 were accompanied by a significant change in the elite constellation or redistribution of their wealth, populists tend to interpret these events as elite-inspired strategies of inter-elite competition.

The linear regression results of the dependence of the perception of Euromaidan, European integration, and NATO on the intensity of populist beliefs fully confirm this prediction (see Appendices 6-a, 6-b, and 6-c, respectively).

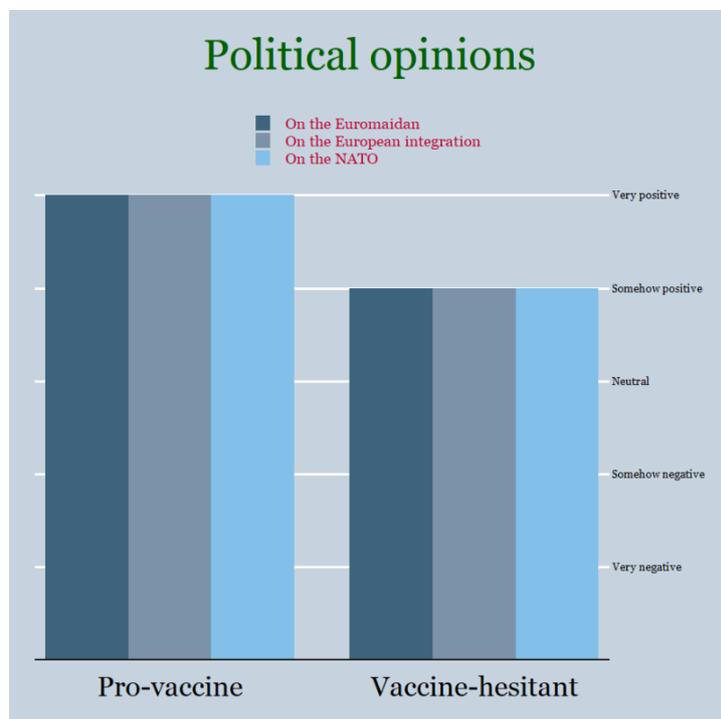
As these results suggest, respondents are less likely to believe that Euromaidan had a positive impact on the state of democracy in Ukraine if they (1) are in favor of direct popular sovereignty, (2) believe that officeholders only talk instead of solving critical issues and (3) fear that minorities easily usurp political influence under democracies. These characteristics perfectly describe the interpretation of Euromaidan inherent to populists: it was an ineffective attempt - quickly tamed by the elites - of the people to influence the political processes, which resulted in a new seizure of power by the oligarchs, and not by the real representatives of the people.

In a similar vein, while evaluating the effectiveness of the European integration policy pursued by the political leadership, respondents will assess it more favorably if they (1) believe in the robustness of representative institutions and doubt that they are easily subordinated to the interests of small groups, (2) profess the liberal ideal of pluralistic state policy, (3) are convinced that political leaders should set the political agenda. In other words, European integration is favorably evaluated by pluralists and elitists, while populists remain wary perceiving it as an embodiment of liberal elitism.

Finally, regarding NATO (please, recall that all data were collected prior to February 24, 2022), the image is also quite clear: respondents who expect active political leadership and support liberal democratic ideals espouse the idea of Ukraine's rapprochement with the Alliance than populists. An interesting finding is that a higher intensity on the moral interpretation of politics (POR5) correlates positively with the desire for closer cooperation

with NATO. This controversial, at first glance, result can have a peculiar interpretation: for pro-NATO respondents, the understanding of politics as a confrontation between good and evil means a more vigorous defense of the liberal ideals with which NATO is associated.

So, overall, we see statistical confirmation that populists tend to nurture a more cynical interpretation of the Euromaidan experience, more critically assess the European integration course, and reject NATO as a necessary component of Ukraine's international security. Such results, however, should neither be applied to all carriers of vaccine sceptic beliefs nor interpreted in absolute terms. When we plotted the level of support for Euromaidan, European integration, and NATO, dividing the responses into two categories depending on whether the respondent was a vaccine enthusiast or a vaccine skeptic, the results turned out to be quite telling. Both categories have a positive attitude to all three processes, albeit with varying intensity. Obviously, the peculiarity of our sample comes into play again: representatives of the educated middle classes, in general, seek further modernization of Ukraine, regardless of whether they doubt vaccines or not.



The results of our in-depth interviews, which we purposefully collected with representatives of various social classes, corroborate that our data is distorted by sample selection. In these interviews, we find a multitude of possible attitudes. For instance, regarding the Euromaidan, one respondent stated that “it did not bring democracy, but social division and did not improve the standard of living, because before the Maidan you could buy guitars, but now you can’t even get strings” while another noted that “for democracy, all these things had a good effect, we are really the only free country in the region,” and a third complained that “political oppression has increased.”

Regarding European integration, opinions also differ. First, there are *overtly negative ones*: “it is bad that it is not for everyone, only for those who can spin and collect cream” or “no one really needs us because the Europeans are just waiting for us to collect strawberries in Poland and Finland.” Second, there is a *critical position*: “it is good, but only half good

because here they rejoiced, and there, well, they impose some obligations on us, the obligations regarding migrants. Well, do we need it?" Third, there are *cautious positive evaluations*: "The European integration could go faster, but this is a complicated policy, so I understand that it is necessary to move gradually." Finally, there are *positive appraisals*: "all my students, or almost all of them, have friends in Europe, and many participate in all kinds of educational projects there. It is cool, and it is real European integration."

Similarly, cooperation with NATO evokes different reactions, ranging from *rejection*, "I categorically do not support it, but here we need a referendum to ask people," to *grudged acceptance*, "Here I am: I did not support it before, but now I do" and even *enthusiasm*: "I fully support the integration with NATO, I think it will help to carry out reforms and build a normal army."

Unfortunately, the small number of interviews collected does not allow us to draw systematic conclusions. However, a review of the available evidence suggests that **it is not vaccine hesitancy but more pronounced populist expectations (with regards to language, evaluation of current politics, expectations about the political process, and positive assessment of the morally good people) which is responsible for a more decisive rejection or at least a more cautious attitude towards Euromaidan, European integration and NATO.**

Some additional evidence to this interpretation is provided by the systematic analysis of the data obtained from the questionnaire. In particular, the results of z-tests (Appendix 7) indicate that vaccine hesitators systematically and with statistically significant results evaluate the experience of Euromaidan, European integration, and NATO *more negatively*. In other words, if there are 100 vaccine hesitators and 100 vaccine enthusiasts in the audience, among the representatives of the first group, there will likely be more people who mistrust Brussels or doubt the necessity to deepen cooperation with NATO. However, and this should be emphasized once again, we are talking about correlation, not causation - and according to our calculations, this correlation is not significant (approx. $r=0.3$). Therefore, vaccine hesitancy is partly a consequence of populism, and the correct interpretation of our findings is that not every vaccine skeptic is a populist and not every populist is a vaccine skeptic, but since populists are currently Eurosceptics, the likelihood that a populist vaccine skeptic is also a Eurosceptic, is growing.

Further evidence for this interpretation is available through social network analysis. On *Facebook* and *Telegram*, we see a plethora of views on anchor issues: although participants discuss international influence, they do not often directly mention the politics of European or Euro-Atlantic integration. People in chat rooms not only do not have a coherent position on this issue but also do not try to crystallize it because they do not discuss the topic. This absence is also reflected in the unclear attitude towards Russia. Undoubtedly, channel members often forward messages from the pages of Russian vaccine hesitators (for example, "QAnon Russia"), but this does not mean that they have any loyalty toward the Russian Federation. Vaccine hesitators do not support any political forces and often criticize the current government. In general, chat members do not engage in debate, and administrators ask to stick to the topic of vaccination. The participants themselves often interpret the debates as the result of the activities of provocateurs or bots, which are allegedly present in the discussion to sow discord. Also, the reason may be a conscious

avoidance of topics that are accompanied by discussions. The negative interpretation of the Euromaidan experience is almost the only relatively the same for all chat participants. However, this is not evidence of a pro-Russian position. Rather, under the influence of the strength of their populist beliefs, many people understand Euromaidan as a popular contention, ultimately instrumentalized by politicians for their purposes. Hence, populism is an engine of mistrust and despair.

6. Conclusions and recommendations

The main conclusion of our work is quite clear: a set of diverse data analyzed through a combination of scientific methods, including statistical analysis, research of media content, and vaccine hesitators' oral testimonies, indicate that **the intensity of populist beliefs of an individual is one of the factors of his/her tendency to distrust and even resist vaccination**. Moreover, other possible factors, such as the level of education or income level, do not affect the propensity for vaccine hesitancy. At the same time, **apart from a tendency towards populism, vaccine hesitators do not share other typical features of political dissatisfaction**, such as rejection of European integration or the project of independent Ukrainian statehood. In other words, the vaccine hesitancy movement in Ukraine is not politicized and remains a separate manifestation of collective distrust of political elites, minorities, and transnational actors rather than a politically organized form of pursuing clearly defined interests. That is why in the same vaccine skeptic chat room, there can be a contributor who opposes NATO membership and denies Russian aggression and a participant who shows enthusiasm for integration with the West and professes anti-Russian views. Similarly, a heathen who votes for nationalist parties and a parishioner of the Orthodox Church who votes for the pro-Russian OPFL can come to an anti-vaccination mass rally. Vaccination-skeptic organizations do not specify their positions on political issues, instead appealing to a broad audience united by a negative attitude towards vaccination. It is significant that, in many cases, populism even preceded the vaccine hesitancy agenda in the activities of many organizations. Thus, in 2019, "Bayonet of the Nation" declared that gas is the people's property and fought against high utility tariffs. In his videos, Serhii Mikiten discussed the problem of the population's lack of a genuine right to choose representatives to the authorities and accused the political forces of being "accomplices who are basically fooling all of us, fooling the entire people." Likewise, in 2018, Ostap Stakhiv headed the "Idea of the Nation" organization, describing it as a "Ukrainian national force that does not belong to the right, the left, or the centrists. We represent the whole Ukrainian nation, as a single whole Ukrainian people".

It is essential to conceptualize the mechanism that links populism and vaccine hesitancy. It works as follows: people who are convinced that under a democratic regime, certain selfish minorities, such as pharmaceutical corporations or anti-natalists, can easily push through solutions that are beneficial to themselves, but contrary to the needs of the people, believe that these tricks and behind-the-scenes games must be resisted in two ways: (1) through a search for real people's tribunes, who will resolutely represent the people through their actions, and (2) through the open and covert sabotage of policies, these sinister interest groups advance in criminal cooperation with the national government. In this form, vaccine

hesitancy is a modern manifestation of what the anthropologist James Scott calls the “weapon of the weak” (Scott, 1985), that is, the invisible everyday resistance of politically and socially weak players to the norms and rules imposed by dominant actors. Examples of such resistance range from sabotage and delaying the completion of a task to pilfering the oppressor's wealth and covert ridicule. Weapons of the weak temporarily weaken the dominant player's power over subordinates and restore those subordinates' sense of self-worth and agency (Scott, 1985: 137).

This reading of the internal logic of vaccine hesitancy perfectly explains why these beliefs do not depend on cultural, material, or educational factors: in conditions where the medical establishment unapologetically and without any consultation imposes vaccination as the primary way of ensuring public health, wealthy and educated people - just as poor and uninformed - can feel oppressed and depersonalized. If, simultaneously, the person – due to a variety of other reasons - has inherent populist political sentiments, the general result will be a resolute rejection of vaccination as a form of elite and minority control over the people. As our respondent noted during an in-depth interview, *“I am not satisfied with the attitude of medical workers towards us, in terms of information. They should explain to us, the parents of our children, adults, everything from A to Z - about the possible consequences, so that we are ready for everything”*. These words reveal not so much the obscurantism of which vaccine enthusiasts often accuse vaccine hesitators as the demand for informed consent that embodies the autonomous individual of Modernity. No less tellingly, another respondent recognized the object of her distrust: *“I haven't vaccinated children for seven years. When our first son was born, I thought for a long time and my great mistrust of the state, the quality of vaccines, and the irresponsibility of vaccination: in our state, no one is responsible for anything”*.

Based on our findings, we consider it appropriate to advance the following recommendations:

- 1. State authorities should diversify the means of informing the population about the benefits of vaccination.** This applies to both the form and the content of the delivery. For example, pro-vaccination messages should not be organized solely as posters in the clinic, on which doctors in white coats announce that “according to statistics, vaccines provide the best protection against infectious diseases” because this is a clear example of cold technocratism, which will conflict with the worldview of people inclined to populism. Instead, it is worth using more down-to-earth forms of communication, e.g., a testimony of a mother who sincerely describes all her concerns regarding vaccination but eventually opts for it.
- 2. Social movements and non-governmental organizations promoting vaccination should work more closely with people on the ground.** It is necessary to meet more often with members of the vaccine skeptic community and engage them in friendly discussions in order to signalize “we do not impose our position on you and do not deny your rights as an individual.” Eventually, through gradual interaction, they will be able to dispel the impression that they belong to a hostile coalition and convince individuals of the advantages of vaccination.

3. Every citizen of Ukraine should stop absolutizing his/her position in the debate about vaccination and branding the opponent for moral and intellectual incompetence. Both the results of this study and the experience of our private communication with vaccine hesitators show that no matter which side of this barricade we are on, the dividing line is much less clear than the features we share, namely the desire for a stable and prosperous Ukraine, a country, where individuals had the right to full self-realization, and communities got the opportunity for an active and fruitful collective life. For most of us, this means a democratic regime with respect for citizens' social and political rights, regardless of whether we vaccinate. Therefore, it is worth stopping and not amplifying the social cleavage because otherwise, the vaccination issue is bound to become one.

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PLU3

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
В-прихил	884	2.493213	.044171	1.3133	2.40652	2.579905
В-скепти	117	3.239316	.1305465	1.412076	2.980753	3.49788
combined	1,001	2.58042	.0425437	1.346022	2.496934	2.663905
diff		-.7461036	.1303653		-1.001925	-.4902823

diff = mean(В-прихил) - mean(В-скепти) t = -5.7232
 Ho: diff = 0 degrees of freedom = 999

Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
 Pr(T < t) = 0.0000 Pr(|T| > |t|) = 0.0000 Pr(T > t) = 1.0000

PLU4

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
В-прихил	884	4.614253	.0255475	.7595824	4.564112	4.664394
В-скепти	117	4.213675	.0992375	1.073418	4.017123	4.410228
combined	1,001	4.567433	.0256718	.8122181	4.517056	4.617809
diff		.4005782	.0789334		.2456839	.5554724

diff = mean(В-прихил) - mean(В-скепти) t = 5.0749
 Ho: diff = 0 degrees of freedom = 999

Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
 Pr(T < t) = 1.0000 Pr(|T| > |t|) = 0.0000 Pr(T > t) = 0.0000

E4

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
В-прихил	884	3.434389	.0416364	1.237941	3.352671	3.516107
В-скепти	117	2.931624	.123634	1.337306	2.686751	3.176497
combined	1,001	3.375624	.0398143	1.259669	3.297495	3.453754
diff		.5027652	.1229611		.2614736	.7440568

diff = mean(В-прихил) - mean(В-скепти) t = 4.0888
 Ho: diff = 0 degrees of freedom = 999

Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
 Pr(T < t) = 1.0000 Pr(|T| > |t|) = 0.0000 Pr(T > t) = 0.0000

1-b. Two-sample t-test with equal variances: not statistically significant

PLU1

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
В-прихил	886	4.352144	.0294515	.8766467	4.294341	4.409947
В-скепти	117	4.333333	.0875376	.9468642	4.159954	4.506713
combined	1,003	4.34995	.0279332	.8846481	4.295136	4.404764
diff		.0188111	.0870599		-.1520296	.1896519

diff = mean(В-прихил) - mean(В-скепти) t = 0.2161
 Ho: diff = 0 degrees of freedom = 1001

Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
 Pr(T < t) = 0.5855 Pr(|T| > |t|) = 0.8290 Pr(T > t) = 0.4145

PLU2

Two-sample t test with equal variances

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
В-прихил	882	4.73356	.0183759	.5457364	4.697494	4.769626
В-скепти	117	4.700855	.0645383	.698088	4.573029	4.828681
combined	999	4.72973	.0178882	.5653904	4.694627	4.764832
diff		.0327054	.0556476		-.0764945	.1419053

diff = mean(В-прихил) - mean(В-скепти) t = 0.5877
 Ho: diff = 0 degrees of freedom = 997

Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
 Pr(T < t) = 0.7216 Pr(|T| > |t|) = 0.5569 Pr(T > t) = 0.2784

E2

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
В-прихил	881	4.548241	.0297072	.8817595	4.489935	4.606546
В-скепти	117	4.632479	.0763891	.8262743	4.48118	4.783777
combined	998	4.558116	.0277122	.875459	4.503735	4.612497
diff		-.084238	.0861449		-.2532844	.0848084

diff = mean(В-прихил) - mean(В-скепти) t = -0.9779
 Ho: diff = 0 degrees of freedom = 996

Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
 Pr(T < t) = 0.1642 Pr(|T| > |t|) = 0.3284 Pr(T > t) = 0.8358

E3

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
В-прихил	885	4.123164	.0331855	.9872348	4.058032	4.188295
В-скепти	117	4.179487	.092143	.9966788	3.996986	4.361988
combined	1,002	4.129741	.0312123	.9880069	4.068491	4.19099
diff		-.0563233	.097224		-.2471098	.1344631

diff = mean(В-прихил) - mean(В-скепти) t = -0.5793
 Ho: diff = 0 degrees of freedom = 1000

Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
 Pr(T < t) = 0.2813 Pr(|T| > |t|) = 0.5625 Pr(T > t) = 0.7187

2-a. Two-sample Wilcoxon rank-sum (Mann-Whitney) test

POP1

VACC_n	obs	rank sum	expected
В-прих	886	434455	444772
В-скеп	117	69051	58734
combined	1003	503506	503506

unadjusted variance 8673054.00

adjustment for ties -1.11e+06

adjusted variance 7566987.79

Ho: POP1_n(VACC_n==В-прихильники) = POP1_n(VACC_n==В-скептики)

z = -3.751

Prob > |z| = 0.0002

POP3

VACC_n	obs	rank sum	expected
В-прих	886	434061	444329
В-скеп	116	68442	58174
combined	1002	502503	502503

unadjusted variance 8590360.67

adjustment for ties -1.32e+06

adjusted variance 7267260.48

Ho: POP3_n(VACC_n==В-прихильники) = POP3_n(VACC_n==В-скептики)

z = -3.809

Prob > |z| = 0.0001

POP5

VACC_n	obs	rank sum	expected
В-прих	883	434001.5	441500
В-скеп	116	65498.5	58000
combined	999	499500	499500

unadjusted variance 8535666.67

adjustment for ties -1.83e+06

adjusted variance 6703859.50

Ho: POP5_n(VACC_n==В-прихильники) = POP5_n(VACC_n==В-скептики)

z = -2.896

Prob > |z| = 0.0038

POP2

VACC_n	obs	rank sum	expected
В-прих	884	433367	442884
В-скеп	117	68134	58617
combined	1001	501501	501501

unadjusted variance 8636238.00

adjustment for ties -527697.92

adjusted variance 8108540.08

Ho: POP2_n(VACC_n==В-прихильники) = POP2_n(VACC_n==В-скептики)

z = -3.342

Prob > |z| = 0.0008

POP4

VACC_n	obs	rank sum	expected
В-прих	886	431989.5	444772
В-скеп	117	71516.5	58734
combined	1003	503506	503506

unadjusted variance 8673054.00

adjustment for ties -1.37e+06

adjusted variance 7307512.36

Ho: POP4_n(VACC_n==В-прихильники) = POP4_n(VACC_n==В-скептики)

z = -4.729

Prob > |z| = 0.0000

POP6

VACC_n	obs	rank sum	expected
В-прих	886	431120.5	444772
В-скеп	117	72385.5	58734
combined	1003	503506	503506

unadjusted variance 8673054.00

adjustment for ties -815673.86

adjusted variance 7857380.14

Ho: POP6_n(VACC_n==В-прихильники) = POP6_n(VACC_n==В-скептики)

z = -4.870

Prob > |z| = 0.0000

POP7

VACC_n	obs	rank sum	expected
В-прих	884	431168	442884
В-скеп	117	70333	58617
combined	1001	501501	501501

unadjusted variance 8636238.00
adjustment for ties -1.65e+06

adjusted variance 6983554.76

Ho: POP7_n(VACC_n==В-прихильники) = POP7_n(VACC_n==В-скептики)
z = -4.433
Prob > |z| = 0.0000

POP8

VACC_n	obs	rank sum	expected
В-прих	884	427921	442000
В-скеп	115	71579	57500
combined	999	499500	499500

unadjusted variance 8471666.67
adjustment for ties -998260.40

adjusted variance 7473406.27

Ho: POP8_n(VACC_n==В-прихильники) = POP8_n(VACC_n==В-скептики)
z = -5.150
Prob > |z| = 0.0000

PLU3

VACC_n	obs	rank sum	expected
В-прих	884	427665	442884
В-скеп	117	73836	58617
combined	1001	501501	501501

unadjusted variance 8636238.00
adjustment for ties -622519.34

adjusted variance 8013718.66

Ho: PLU3_n(VACC_n==В-прихильники) = PLU3_n(VACC_n==В-скептики)
z = -5.376
Prob > |z| = 0.0000

PLU4

VACC_n	obs	rank sum	expected
В-прих	884	453402.5	442884
В-скеп	117	48098.5	58617
combined	1001	501501	501501

unadjusted variance 8636238.00
adjustment for ties -3.07e+06

adjusted variance 5567647.13

Ho: PLU4_n(VACC_n==В-прихильники) = PLU4_n(VACC_n==В-скептики)
z = 4.458
Prob > |z| = 0.0000

E4

VACC_n	obs	rank sum	expected
В-прих	884	454238	442884
В-скеп	117	47263	58617
combined	1001	501501	501501

unadjusted variance 8636238.00
adjustment for ties -928529.26

adjusted variance 7707708.74

Ho: E4_n(VACC_n==В-прихильники) = E4_n(VACC_n==В-скептики)
z = 4.090
Prob > |z| = 0.0000

2-b. Two-sample Wilcoxon rank-sum (Mann-Whitney) test: statistically insignificant variables

PLU1

VACC_n	obs	rank sum	expected
В-прих□	886	444433	444772
В-скен□	117	59073	58734
combined	1003	503506	503506

unadjusted variance 8673054.00
 adjustment for ties $-1.77e+06$
 adjusted variance 6900703.59

Ho: PLU1_n(VACC_n==В-прихильники) = PLU1_n(VACC_n==В-скептики)
 $z = -0.129$
 Prob > |z| = 0.8973

PLU2

VACC_n	obs	rank sum	expected
В-прих◆	882	440765	441000
В-скен◆	117	58735	58500
combined	999	499500	499500

unadjusted variance 8599500.00
 adjustment for ties $-4.01e+06$
 adjusted variance 4586319.68

Ho: PLU2_n(VACC_n==В-прихильники) = PLU2_n(VACC_n==В-скептики)
 $z = -0.110$
 Prob > |z| = 0.9126

E2

VACC_n	obs	rank sum	expected
В-прих◆	881	437043	440059.5
В-скен◆	117	61458	58441.5
combined	998	498501	498501

unadjusted variance 8581160.25
 adjustment for ties $-3.32e+06$
 adjusted variance 5260953.87

Ho: E2_n(VACC_n==В-прихильники) = E2_n(VACC_n==В-скептики)
 $z = -1.315$
 Prob > |z| = 0.1885

E3

VACC_n	obs	rank sum	expected
В-прих◆	885	441300.5	443827.5
В-скен◆	117	61202.5	58675.5
combined	1002	502503	502503

unadjusted variance 8654636.25
 adjustment for ties $-1.38e+06$
 adjusted variance 7278998.19

Ho: E3_n(VACC_n==В-прихильники) = E3_n(VACC_n==В-скептики)
 $z = -0.937$
 Prob > |z| = 0.3489

3. Chi-square test

Key
<i>frequency</i>
<i>expected frequency</i>

VACNUM	Фах					Total
	Природнич	Інженерія	Програмув	Суспільст	Гуманітар	
В-прихильники	129 124.6	107 111.3	56 55.2	187 187.8	373 373.0	852 852.0
В-скептики	11 15.4	18 13.7	6 6.8	24 23.2	46 46.0	105 105.0
Total	140 140.0	125 125.0	62 62.0	211 211.0	419 419.0	957 957.0

Pearson chi2(4) = 3.0358 Pr = 0.552
Cramér's V = 0.0563

Key
<i>frequency</i>
<i>expected frequency</i>

VACNUM	Освіта				Total
	Маю шкіль	Навчаюся	Маю дипло	Маю науко	
В-прихильники	21 26.5	67 72.4	711 704.8	86 81.3	885 885.0
В-скептики	9 3.5	15 9.6	87 93.2	6 10.7	117 117.0
Total	30 30.0	82 82.0	798 798.0	92 92.0	1,002 1,002.0

Pearson chi2(3) = 16.0813 Pr = 0.001
Cramér's V = 0.1267

Key
<i>frequency</i>
<i>expected frequency</i>

VACNUM	Стать				Total
	Чоловік	Жінка	Не скажу	Не скажу	
В-прихильники	278 278.5	606 604.7	1 0.9	0 0.9	885 885.0
В-скептики	37 36.5	78 79.3	0 0.1	1 0.1	116 116.0
Total	315 315.0	684 684.0	1 1.0	1 1.0	1,001 1,001.0

Pearson chi2(3) = 7.7908 Pr = 0.051
Cramér's V = 0.0882

Key
<i>frequency</i>
<i>expected frequency</i>

VACNUM	Релігійні погляди					Total
	Атеїзм	Християнс	Іслам	Юдаїзм	Інша релі	
В-прихильники	333 305.6	422 430.1	1 1.8	1 0.9	128 146.6	885 885.0
В-скептики	13 40.4	65 56.9	1 0.2	0 0.1	38 19.4	117 117.0
Total	346 346.0	487 487.0	2 2.0	1 1.0	166 166.0	1,002 1,002.0

Pearson chi2(4) = 45.5835 Pr = 0.000
Cramér's V = 0.2133

Key
<i>frequency</i>
<i>expected frequency</i>

VACNUM	Матеріальний статус				Total
	Недостатн	Базовий	Достатній	Забезпече	
В-прихильники	7 7.1	46 53.9	458 461.0	374 363.0	885 885.0
В-скептики	1 0.9	15 7.1	64 61.0	37 48.0	117 117.0
Total	8 8.0	61 61.0	522 522.0	411 411.0	1,002 1,002.0

Pearson chi2(3) = 12.8912 Pr = 0.005
Cramér's V = 0.1134

c. Assessment of modified model

Logistic model for VACSCEP

Classified	True		Total
	D	~D	
+	7	1	8
-	169	816	985
Total	176	817	993

Classified + if predicted $\Pr(D) \geq .5$
 True D defined as VACSCEP != 0

Sensitivity	$\Pr(+ D)$	3.98%
Specificity	$\Pr(- \sim D)$	99.88%
Positive predictive value	$\Pr(D +)$	87.50%
Negative predictive value	$\Pr(\sim D -)$	82.84%
False + rate for true ~D	$\Pr(+ \sim D)$	0.12%
False - rate for true D	$\Pr(- D)$	96.02%
False + rate for classified +	$\Pr(\sim D +)$	12.50%
False - rate for classified -	$\Pr(D -)$	17.16%
Correctly classified		82.88%

5. Correlation analysis

	POP3_n	POP6_n	POP8_n	PLU3_n	PLU4_n
POP3_n	1.0000				
POP6_n	0.2321	1.0000			
POP8_n	0.2374	0.2348	1.0000		
PLU3_n	0.0820	0.1258	0.1054	1.0000	
PLU4_n	-0.0835	-0.1320	-0.0989	-0.0397	1.0000

6. Linear logistic regression

a. The dependence of the attitude towards Euromaidan on the intensity of populist beliefs (only statistically significant variables are shown):

Source	SS	df	MS	Number of obs	=	991
Model	107.402952	6	17.900492	F(6, 984)	=	21.52
Residual	818.524394	984	.831833734	Prob > F	=	0.0000
				R-squared	=	0.1160
				Adj R-squared	=	0.1106
Total	925.927346	990	.935280148	Root MSE	=	.91205

MAIDAN_n	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
POP1_n	-.0647583	.0241987	-2.68	0.008	-.1122453 -.0172714
POP3_n	-.1011641	.0270327	-3.74	0.000	-.1542124 -.0481158
POP4_n	-.0671912	.0277171	-2.42	0.016	-.1215826 -.0127999
PLU3_n	-.0737348	.0217652	-3.39	0.001	-.1164463 -.0310232
PLU4_n	.2630173	.0361047	7.28	0.000	.1921663 .3338684
E2_n	.0850709	.033867	2.51	0.012	.018611 .1515308
_cons	3.774375	.2460392	15.34	0.000	3.291553 4.257197

b. The dependence of the attitude towards European integration on the intensity of populist beliefs (only statistically significant variables are shown):

Source	SS	df	MS	Number of obs	=	989
Model	98.7083763	6	16.4513961	F(6, 982)	=	20.05
Residual	805.661694	982	.820429424	Prob > F	=	0.0000
				R-squared	=	0.1091
				Adj R-squared	=	0.1037
Total	904.370071	988	.915354323	Root MSE	=	.90578

INTEGRATIO~n	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
POP3_n	-.1120168	.0261148	-4.29	0.000	-.163264 -.0607695
PLU2_n	.1169246	.0533193	2.19	0.029	.0122918 .2215575
PLU3_n	-.0944038	.0215988	-4.37	0.000	-.136789 -.0520186
PLU4_n	.2118647	.0365396	5.80	0.000	.1401601 .2835693
E1_n	.0868517	.0230371	3.77	0.000	.0416441 .1320593
E2_n	.0766785	.0332635	2.31	0.021	.0114029 .1419542
_cons	2.757046	.3194689	8.63	0.000	2.130126 3.383966

c. Dependence of the attitude towards NATO on the intensity of populist beliefs (only statistically significant variables are shown):

NATO_n	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
POP3_n	-.1493001	.0279747	-5.34	0.000	-.2041967 -.0944035
POP5_n	.0548244	.0246824	2.22	0.027	.0063885 .1032603
PLU3_n	-.0574151	.0230287	-2.49	0.013	-.1026059 -.0122244
PLU4_n	.1727052	.0382487	4.52	0.000	.0976473 .2477631
E1_n	.0756121	.0244371	3.09	0.002	.0276575 .1235666
_cons	3.715575	.2192498	16.95	0.000	3.285327 4.145823

7. Two-sample Wilcoxon rank-sum (Mann-Whitney) test: attitude to Euromaidan, European integration and NATO

VACC_n	obs	rank sum	expected
В-прих	883	462804	441941.5
В-скеп	117	37696	58558.5
combined	1000	500500	500500

unadjusted variance 8617859.25
 adjustment for ties -3.53e+06
 adjusted variance 5083266.51

Ho: MAIDAN_n (VACC_n==В-прихильники) = MAIDAN_n (VACC_n==В-скептики)
 z = 9.253
 Prob > |z| = 0.0000

VACC_n	obs	rank sum	expected
В-прих	885	469961	443827.5
В-скеп	117	32542	58675.5
combined	1002	502503	502503

unadjusted variance 8654636.25
 adjustment for ties -2.74e+06
 adjusted variance 5916006.74

Ho: INTEGR~n (VACC_n==В-прихильники) = INTEGR~n (VACC_n==В-скептики)
 z = 10.744
 Prob > |z| = 0.0000

VACC_n	obs	rank sum	expected
В-прих	885	465789.5	443827.5
В-скеп	117	36713.5	58675.5
combined	1002	502503	502503

unadjusted variance 8654636.25
 adjustment for ties -2.63e+06
 adjusted variance 6027879.36

Ho: NATO_n (VACC_n==В-прихильники) = NATO_n (VACC_n==В-скептики)
 z = 8.945
 Prob > |z| = 0.0000

8. Matrix of the presence of populism and other political topics in the Internet messages of major organizations and communities of vaccinists

Name	Vaccine hesitancy	Populism	EU, NATO	Russian aggression, language policy, decommunization	Political parties	Economy	Other political views
Human rights	Yes	Yes	-	-	-	-	-
Vaccination is a free choice	Yes	-	-	-	-	-	-
STOP Fake Pandemic	Yes	Yes	-	-	-	Against agricultural land market	Human rights, problem of control over people, negative views on international organizations
League for the Protection of Civil Rights	Yes	-	-	-	-	-	
Terra Freedom Ukraine	Yes	Yes	-	-	-	-	-
Anti COVID Court News	Yes	-	-	-	-	-	Human rights
NGO "Baynet of the Nation"	Yes	Yes	Against EU	Commemoration of ATO soldiers who died in Ilovaisk	-	Against agricultural land market	Human rights, negative views on international organizations
PRAVI.MEDIA	Yes	Yes	-	-	-	-	Negative views on international organizations
Free space	Yes	Yes	-	-	-	Against agricultural land market, small businesses development issues	Human rights, problem of control over people, negative views on international organizations, homophobia.
Dilemmas of conscience	Yes	-	-	-	-	-	Human rights, problem of control over people and negative views on international organizations. Against climate policies.
Booster dose. Interesting about vaccination	Yes	-	-	-	-	-	Human rights. Against climate policies
Net Maska Ua. PRAVOVED.	Yes	Yes	-	Legitimization of separatist republics in Donbas	-	Against agricultural land market	Human rights
Anti-vaccinator	Yes	Yes	-	-	-	-	Human rights
No vaccination	Yes	-	-	-	-	-	Human rights, problem of control over people, negative views on international organizations
Ukraine on needle	Yes	Yes	-	-	-	-	-
Serhii Mykyten	Yes	Yes	-	-	-	Against agricultural land market	Human rights
Ostap Stakhiv	Yes	Yes	-	-	-	Against agricultural land market, small businesses development issues	Human rights, problem of control over people, negative views on international organizations
Zakhar Miliutin	Yes	Yes	-	Against pro-Russian actors	-	-	-
Serhii Dibrov	Yes	-	-	-	-	-	-

9. Questions used to measure the populist sentiments:

POP1	The people, not politicians, should make the most important policy decisions.
POP2	Differences between the elite and the people are larger than those within the people.
POP3	I would rather be represented by a fellow citizen than by a professional politician.
POP4	Officials talk too much and take too little action.
POP5	Politics is ultimately a struggle between Good and Evil.
POP6	“Compromise” in politics is selling out on one’s principles.
POP7	Interest groups have too much influence over political decisions.
POP8	Representatives of the people should resemble their constituency in manners and speech.
PLU1	Under democracy, the variety of opinions and the need to reconcile them is crucial
PLU2	Public policy must account for needs of different groups.
PLU3	Under democracy, minorities can easily impose their interests upon the majority.
PLU4	It is OK that under democracy my preferable candidates cannot always win.
E1	Politicians should guide rather than follow the people.
E2	MPs should be well-mannered and avoid crude speech.
E3	Ukraine would be governed better if important decisions were left up to independent experts.
E4	During crisis, the laypeople’s role in policy making should be limited.