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**“THEY WILL FORCE EVERYONE”:  
MAIN THEMES, ARGUMENTS AND COMPLAINTS  
PRESENT IN LATVIAN COVID-19 ANTI-VACCINE  
MOVEMENT ON FACEBOOK**

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**“They will force everyone”: main themes, arguments and complaints present in Latvian COVID-19 anti-vaccine movement on Facebook**

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## **Abstract**

This paper explores the COVID-19 anti-vaccine peer-to-peer communication in Latvia, a country with one of the highest vaccine hesitancy rates in Europe. We use qualitative analysis on manually collected data from public Facebook groups to identify and discuss the main narratives, values, and beliefs holding together the online anti-vaccine movement in Latvia in the context of existing frameworks.

We find that distrust in government plays a central role in the Latvian anti-vaccine narrative. Alleged incompetence and bribery of local healthcare professionals and the overall healthcare system acts as another prominent source for anti-vaccine discussion. Such underlying concerns together with the popularity of unreliable news and data sources have severely distorted the risk-benefit analysis of the COVID-19 vaccines and made other means of evaluating the vaccines, such as convenience and collective responsibility, irrelevant. In our sample, we also see most central COVID-19 misinformation and conspiracies covered, also vast referencing to the political decisions made abroad.

Our findings fill the research gap, providing a deep local context to the issue in Latvia. It points out the several ways in which governmental, media and healthcare professionals could help increase not only COVID-19 vaccine uptake, but also strengthen the society's trust in themselves as the deteriorating faith in medics highlights as especially concerning.

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## 1. Introduction

At the beginning of 2020, news of odd pneumonia occurrences in Wuhan, China started to circulate (World Health Organization [WHO], 2020a). By January 9, 2020, the WHO conveyed to the world the conclusion of the Chinese government about the cause of this illness, namely, a novel coronavirus. Since the first public disclosure of the sickness made by the Wuhan Municipal Health Commission was at the very end of 2019, WHO named the new disease COVID-19, a short form of “coronavirus disease” and the year when it was discovered; the virus carrying the disease would become known as SARS-CoV-2, shortened from “severe acute respiratory syndrome coronavirus 2” (WHO, n.d.-a, para. 3).

COVID-19 officially reached Europe on January 24, 2020, when France reported three cases, all imported by travellers from Wuhan (WHO, 2020). The hopes of containing the virus in Wuhan were eradicated and on March 11, 2020, WHO labelled the outbreak as a pandemic. Basic protective measures such as increased hygiene practices, social distancing, and wearing of face masks, were not effective enough to eradicate COVID-19, and vaccines against the virus became the public’s largest hope in defeating the disease.

By utilizing the mRNA technology for the first time, COVID-19 vaccines were developed in less than a year - multiple times quicker than vaccines usually are - after an international mobilization and collaboration in vaccine research, development, and distribution (Solis-Moreira, 2021). When WHO declared the pandemic on March 11, the number of registered cases was 148,476; by the time of vaccine rollout on December 8, this number had exceeded 69 million (“COVID-19 Coronavirus Pandemic,” n.d.).

While vaccination start was anticipated to become a turning point in the battle against the pandemic, it would take time and willingness of the people to take the jabs to reach the mass protection against COVID-19. This is where a phenomenon of “vaccine hesitancy” emerges, described as one’s reluctance to get vaccinated even if they have the opportunity.

Online communication has given these like-minded people a chance to connect and exchange information further cultivating the vaccine hesitancy and turning it into a social movement that has created a significant threat to public health (Darius & Urquhart, 2021).

Showing the sixth-lowest full COVID-19 vaccination rates in Europe with more than 42.4% of the population still unvaccinated against COVID-19 as of November 14, 2021, Latvia's economy has become heavily threatened by the COVID-19 vaccine hesitancy of a large part of the population (European Centre for Disease Prevention and Control, n.d.). From

high activity on digital platforms to illegal protests in the capital city, the Latvian anti-vaccine community has shown strong resistance against science, statistics, and expert arguments.

Existing research on COVID-19 vaccine hesitancy in Latvia is primarily based on surveys, quantifying the vaccine sceptics by characteristics like age, gender, wage, nationality, place of living, political stance, etc. Meanwhile, news picks up various “pieces of the puzzle,” like how some politicians associate with the anti-vaccine community to gain support in elections.

However, we find an absence of research regarding the communication and messaging within this anti-vaccine movement in Latvia, which is particularly important to understand to design effective communication strategies that encourage vaccination and lessen the anti- and pro- vaccine polarization within the society.

We aim to fill this gap by analysing the narratives, values, and beliefs holding together the online anti-vaccine movement in Latvia through the following research question: **What themes, arguments and complaints are present in the Latvian COVID-19 anti-vaccine movement on Facebook?**

This analysis aims to provide a deep understanding of the peer-to-peer communication within the Latvian online anti-vaccine movement that undermines vaccine uptake, which is a crucial step in preventing COVID-19 hospitalizations and deaths. This understanding will help to recognize factors that have to be addressed to effectively tackle the persistent problem of vaccine hesitancy. This is an important challenge for Latvia right now as previous vaccination campaigns have shown exceptionally low success rates, widely criticized for their resemblance to campaigns in other countries and failure of communicating the relevant information (Ambote, 2021).

When constructing our design, we considered the research by Johnson et al. (2020) who found that anti-vaccine messages follow the pattern of being formulated as peer-to-peer communication while pro-vaccine ideas are more often expressed as expert-to-masses. Therefore, we aim to analyse the narratives of the Latvian anti-vaccine movement through qualitative analysis of their peer-to-peer communication within public groups of the most popular user-generated content platform in Latvia – Facebook.

After manual extraction of qualitative and quantitative data of the posts and comments from the two largest anti-vaccination Facebook groups, we code and analyse the data. We then discuss the results by identifying and explaining the most popular themes and arguments among the Latvian anti-vaccine community and determining whether they are unique to this region considering existing research on this topic in other countries.

## 2. Literature review

The literature review is organized as follows: firstly, we discuss the concept of vaccine hesitancy in general, its definition, lengthy history, and potential causes. Next, we examine vaccine hesitancy in the specific context of COVID-19, including which factors appear to be related to lower willingness to get the vaccine during the pandemic and describing how hesitancy among medical workers and the spread of misinformation might have hit the public's confidence in vaccines. Later, we explain what role social media plays in provoking vaccine hesitancy and provide examples of narratives, themes, and rhetoric related to anti-vaccine communities. Lastly, we provide some background to vaccine hesitancy in Latvia and what factors play the largest role in the unwillingness to get the COVID-19 vaccine. The literature review provides a solid background for building our analysis on inspecting the ways individuals justify their hesitance and what are the related topics occurring in the online communication of the anti-vaccine movement in Latvia.

### 2.1. Vaccine hesitancy

We begin the literature review by describing the key concept of our thesis – vaccine hesitancy, also looking at its origins and possible sources.

**2.1.1. Definition.** Although the exact definition of the term “vaccine hesitancy” can vary, the one by MacDonald (2015, p. 4161) along with SAGE Working Group of Vaccine Hesitancy captures the essence: “Vaccine hesitancy refers to delay in acceptance or refusal of vaccination despite availability of vaccination services.” When discussing the definition, they also outline how sophisticated the search for roots of such behaviour is. MacDonald (2015) argues that the motivation differs by geography and the contextual background it implies, individual beliefs and social influence, as well as the vaccine and disease it is supposed to protect against.

Another concern related to definition is raised by Dubé et al. (2013), who scrutinized vaccine hesitancy studies predominantly in the context of parental actions. They emphasize how hesitancy must be considered on a spectrum. While on extremes there are individuals who either accept or refuse all vaccines, there is a mixture of people in-between, not attributable to either of the extremes: the vaccine hesitant. As authors note, inconsistencies might arise at this point, as researchers can decide where to set the hurdle of accounting for someone as vaccine hesitant. For instance, should individuals who have not refused a single vaccine for their offspring, yet have openly raised concerns about vaccine safety, efficacy, or both, be considered vaccine hesitant? Dubé et al. (2013) also noted how the allocation of an individual

can change depending on the scope of vaccines under question. There might be parents who refuse just a few vaccines (against less risky diseases such as rotavirus or flu), yet despite accepting most, they would be considered vaccine hesitant in the overall context.

For our research, we use the broad definition of vaccine hesitancy, grouping the vaccine hesitant (have gotten the COVID-19 vaccine, but publicly express their scepticism towards it) and vaccine refusing (not vaccinated and publicly sceptical). This is due to the data limitations as we do not have access to individuals' COVID-19 vaccination status to determine in which of the sub-group (vaccine hesitant or vaccine refusing) he/she falls under.

**2.1.2. History of vaccine hesitancy.** Vaccine hesitancy is not a novel dispute. Before this outbreak, the WHO (n.d.-b) included vaccine hesitancy on their list of ten main threats to public health in 2019. According to the WHO, vaccination saves two to three million lives annually, capable of saving another 1.5 million if progress in global distribution was made, outlining what health consequences have been at stake with vaccine hesitancy even before COVID-19. As an example, WHO highlights a recent hike in measles by 30%; while not all this effect can be attributed to vaccine hesitancy, some territories which had almost eliminated the disease now have seen a new wave after a decline in vaccine uptake.

Vaccine hesitancy sentiment is old and can influence law making; narratives against vaccination in the US can be dated as far back as the middle of the 19th century (Kaufman, 1967). In the early 1800s, smallpox vaccination eradicated the outbreaks. With apparent threat from the disease gone, vaccination rates tumbled, which led to a new smallpox surge, reaching epidemic levels in the 1870s. While the initial vaccination drop was not attributable to anti-vaccination proponents as they were lone, unconventional healthcare practitioners who failed to gain much traction, they had a significant impact once the 1870s outbreak began, forcing multiple US states to drop initial compulsory vaccination laws after facing opposition.

More contemporary examples highlight the ripple effect flawed scientific research can have. Almost 50 years ago Kulenkampff et al. (1974) published an article that indicated a link between the triple diphtheria-tetanus-pertussis vaccine and neurological damage in infants. A subsequent larger study proved cases of persistent brain damage are extremely rare and might be attributed to other factors and coincidence with the vaccine schedule and time of the natural peak of when neurological damage in children becomes visible (Miller et al., 1993). Yet, media-induced panic led to the pertussis vaccination rate drop in the UK by 50 percentage points and in the upcoming 12 years, the pertussis epidemic there reached 300 thousand cases and a minimum of 70 deaths (Nicoll et al., 1998). Other countries were affected as well, with



research indicating pertussis prevalence being 10 to 100 times more significant in nations where the anti-vaccine agenda jeopardized immunization efforts (Gangarosa et al., 1998).

Another infamous, retracted article continues to haunt vaccination to this day; it proposed a causality between measles, mumps, and rubella vaccine and autism (Wakefield et al., 1998). Multiple issues with the controversial article were raised, including the lack of a control group, which meant the results might be purely coincidental. National-scale research declined the findings and the article had to be retracted (Gerber & Offit, 2009). Gerber and Offit (2009) demonstrate how Wakefield's initial article led to other theories trying to establish causality between vaccines and autism, first attributing it to mercury, which was included in the multidose vaccines, then to the large vaccine count overwhelming the immunity.

The history of vaccine hesitancy has multiple lessons for COVID-19. Exaggerated claims can violently affect the public's belief in the vaccines and create long-term suspicion. For example, the scandal of possible AstraZeneca vaccine link to blood clots, despite low statistical probability, shook the trust of people, which might have spread to other vaccines as well (Pilling, 2021). Next, countless lives are at risk if vaccine hesitancy is let loose; even if COVID-19 is not a vaccine-preventable disease, a recent study from Scotland shows that vaccines can reduce death rates by around 90% (Christie, 2021). Finally, some form of vaccine hesitancy is as old as vaccines themselves, not a phenomenon unique to the recent pandemic and the causes of it are worth to be analysed using also previously created frameworks.

**2.1.3. Causes.** Claims by alternative health care specialists, questionable research, and media coverage are just a couple of contributors to vaccine hesitancy. Various researchers have attempted to classify the potential sources of these doubts. The most widely used categorization is made by the WHO EURO Working Group on Vaccine Communications (2011, as cited in MacDonald, 2015) in the Three C's model, who split distrust into confidence, complacency, and convenience. As MacDonald (2015) clarifies, it covers **confidence** in the vaccine safety and efficacy, including the trust in the process through which it is received, doctors and health institutions, as well as the interests of authorities imposing the vaccination. **Complacency** refers to individuals' anticipation of the disease, namely that vaccination is not necessary as the likelihood of contracting it is low, one's immune system could handle it and the disease complications would not be severe enough to "overreact" by getting vaccinated. Lastly, **convenience** relates to the availability of vaccination places, times, the costs, ability to understand the provided information (language barrier for immigrants), feeling comfortable with the doctor, or even the possible short-term inability to work due to vaccine side effects.

A group of researchers proposed to advance the 3C model into a 5C's of vaccine hesitancy model (Betsch et al., 2018). The fourth C, **calculation**, refers to individuals' careful information research, weighing vaccine risks and benefits, evaluating the mechanism of how vaccine creates immunity. The last C is **collective responsibility**, where one gets the vaccine due to a sense of responsibility of protecting others, doing their own part in reaching the herd immunity, or, on the contrary, skips the vaccination because most have already gotten it.

Improving the C's models, the SAGE Working Group of Vaccine Hesitancy has made the most momentous step in framework development, creating the SAGE WG model (MacDonald, 2015). The group consisted of the health field researchers, used multiple sources and methods to create a comprehensive, worldwide relevant vaccine hesitancy model. Despite the causes being "complex and context-specific, varying across time, place and vaccines", the SAGE WG model groups reasons into three categories: contextual influences, individual and group influences, and vaccine/vaccination concerns (MacDonald, 2015, p. 4161).

**Contextual influences** cover a range of intricate determinants that have formed over time and/or are out of reach to change for an individual (MacDonald, 2015). One of them is religion, culture, gender, and socio-economic factors, like forbiddance by church or a positive connection with salary and vaccine uptake. Hesitancy is also influenced by historical reasons, as well as the media – the information covered and the sentiment on the media. Additionally, the trustworthiness of key figures around vaccination campaigns, as well as the lobbying power of pro- and anti-vaccination advocates will make a difference. Political concerns, such as through which program vaccine gained approval, the country of origin, and who endorses it could contribute to hesitancy, too. Geographic hurdles can affect vaccine uptake in remote or hard access regions, especially if there are strict requirements for vaccine storage conditions. Lastly, an uprising contributor is people's mistrustful view of the pharmaceutical business.

The second group of factors relates to **individual's/close social group's judgement of the vaccine** and the alteration of the views resulting from social contacts (MacDonald, 2015). Experience falls into this group under two separate factors. Firstly, one's own, family, or community members' experience with vaccination and side effects can strongly form biases. Secondly, past encounters with the healthcare system affect the trust individual has. Thirdly, experience will also contribute to the individual's ideas and opinions on wellbeing and disease avoidance. Another subset of individual and group influences correlate with the knowledge of a person. To start, one's lack of insight about which are the vaccine-preventable diseases and when should the shots be received can rise hesitancy. Next, it implies a distorted individual's assessment of the risks and benefits involved in vaccine refusal. Tilting the risks of a disease

can lead to one's disapproval of immunization as a social norm because people feel the chances of contracting the illness are minuscule, while vaccination risks are "guaranteed".

**Vaccine/vaccination problems** are the most direct factors influencing one's decision (MacDonald, 2015). Alongside fundamental concerns as cost, fear of needles, reliability of vaccine source and equipment, some more complex worries appear. Another factor highlighted is the vaccination schedule, addressing the question of whether too many vaccines overwhelm a child's body, which has been disproved (Offit et al., 2002). Additionally, people's hesitancy heightens when the situation is unfamiliar. Therefore, reluctance can increase when they are facing a new or recently adjusted vaccine, same as with a situation of a mass vaccination operation over routine habitual injection. That is the moment when the factor of healthcare workers' knowledge base and attitude and, consequentially, recommendation strength matters the most. Lastly, scientific proof of risks and benefits is an important part of this group.

Up until 2018, the WHO included the vaccine hesitancy section in the Global Vaccine Action Plan [GVAP] secretariat Annual Reports. Countries were asked to list 3 main reasons for vaccine hesitancy in their country; in the 2018 report, 159 countries provided at least one reason (WHO, 2018). The list of reasons followed the SAGE WG model. In all 4 years covered (2014-2017), the top reasons for hesitancy have been the same, namely risks to benefits based on scientific research, followed by religion/culture/gender/socioeconomic factors, and lack of knowledge. The split by income level highlights how lack of knowledge decreases, and the importance of risk/benefit evaluation increases dramatically as the level of wealth goes up.

The danger versus gain from vaccines is especially dramatic in the European region. Out of 43 European countries in the WHO's (2018) GVAP Annual Report, 37 listed individuals' risk/benefit analysis in the TOP3 hesitancy reasons, four times more than any other factor. During the COVID-19 pandemic, journalists have emphasized a further divergence in Europe, with the Eastern part struggling to raise the vaccination rates (The Editorial Board, 2021). This inequality, however, is attributed to a lack of trust due to political history, with division in COVID-19 vaccine hesitancy rates corresponding to the previous borders of communism (Ghodsee & Orenstein, 2021); we will describe belief in officeholders later.

We have established the background of the influences recognized as possible vaccine hesitancy factors and their categorization, as well as outlined notable scepticism rooted in the European region. Now we are moving on to discovering which of these factors researchers have recognized as the most relevant in the context of COVID-19.

## 2.2. Vaccine hesitancy in the context of COVID-19

Most of the vaccine hesitancy debate, especially in the developed world, occurs in the context of exterminating diseases that have been suppressed to negligible levels. An ongoing theory is that the rise in vaccine hesitancy is a consequence of the achievements vaccines have had (Larson et al., 2011). It deforms one's perception of risk-benefit, as benefit becomes not contracting an "almost extinct disease," whilst you have to take the "granted risk" of a vaccine. According to the GAVI global vaccine alliance leader Dr. Seth Berkley, the invisibility of serious sicknesses causes a rise in complacency from the three C's model (Fortuna, 2019). Berkley also argues vaccine misinformation is increasingly more available on the internet, which tilts perceptions of risks even more. Therefore, COVID-19 makes for an interesting case to research. Vaccination had urgency, patients were getting hospitalized, so risks of not getting vaccinated were apparent. What makes people doubtful this time?

Plenty of surveys have been monitoring the public's willingness to get the COVID-19 vaccine, some have incorporated experimental aspects, and often one of the questions is to specify people's main concerns causing the refusal. However, before moving on to the public, we touch upon the middle layer between vaccines and the ordinary people- healthcare workers, to see how this important subgroup might be disturbing confidence in COVID-19 vaccines.

**2.2.1. Hesitancy in the healthcare industry.** An alarming trend is hesitancy among healthcare specialists. August 2020 research, before the vaccine rollout, explores the vaccination concerns of 829 Israeli healthcare workers and 1,112 members of the public (Dror et al., 2020). It was found that individuals with offspring were less likely to get vaccinated, possibly out of fear of endangering their ability to care for their children. The greatest concern of all subgroups was regarding safety, i.e., whether the rapid development allowed for proper quality control. However, the most troubling discovery was the insignificant difference between the vaccine hesitancy among the public and the healthcare workers. This discovery is even more alarming when nurses are separated from doctors. While the public showed an acceptance rate of 75%, only 61% of nurses approved they would get vaccinated voluntarily, a difference statistically significant at a 1% level. As a last hurdle between the individual and COVID-19 vaccine, a vaccine hesitant nurse could overturn the decision of one's inoculation, lowering the public's confidence in vaccines.

Proof of the same concern has been found in other continents as well. In Africa, the Democratic Republic of Congo, just 27.7% of 613 healthcare workers surveyed, showed a

willingness to get the COVID-19 vaccine (Nzaji et al., 2020). In the US, 23% of medical students surveyed, despite strong beliefs they would get exposed to COVID-19, said they would not get vaccinated, mentioning reasons such as concerns about long-term effects, rapid development, suspicions politicians who have sped up the development for political gain, as well as distrust in health authorities authorizing the vaccine (Lucia et al., 2021). Finally, medical worker vaccine scepticism has been observed in Europe, too, with 23.1% of 2047 French healthcare workers refusing the vaccine (Gagneux-Brunon et al., 2021). The refusal rate was the worst among nurses (35.3%) and assistant nurses (39.9%).

The spread of COVID-19 vaccine hesitancy among healthcare workers around the world might have influenced Latvian medics too, and consequentially, the vaccine uptake. Although no direct data on this topic exists, there are some indications of such a trend.

Firstly, the Latvian healthcare professionals' (HPs') doubtful views on non-Covid vaccines, especially flu vaccine, uptake of which has been shown to correlate with COVID-19 vaccine acceptance (Sherman et al., 2021). In 2020, HPs in the EU and UK were surveyed on their views on vaccination (De Figueiredo et al., 2020). Only 81.1% of HPs surveyed in Latvia (1206) agreed seasonal influenza vaccine was safe, 75.1% think it is important, and 72.3% would likely recommend it to patients. In two-thirds of the EU countries with enough data, all 3 of these values were above 90%; Latvian HPs showed the highest distrust in all EU.

Secondly, careless communication is employed by key figures of the seemingly credible Latvian Medical Association (LMA). Pēteris Apinis, LMA's board member and ex-president, the host of a TV broadcast "Dr. Apinis," has a lengthy list of disproved COVID-19 remarks. These include claims like "only chronically sick and old smokers are at risk of dying, others will just sneeze and cough", kids do not get sick with COVID-19, most of the quarantine and mask rules in Latvia were politically motivated (Bērziņa & Puriņa, 2020, para. 4). Moreover, Apinis was playing on people's complacency, insisting COVID-19 could only cause a cough to him as he "runs or bikes daily, eats garlic and drinks ginger tea", also stating those who have recovered from COVID-19 should not get vaccinated as their natural immunity makes getting COVID-19 again practically impossible (Pavlovs, 2020b, para. 4). The current president of LMA, Ilze Aizsilniece, alleged mask rules in Latvia were against the WHO guidelines and caused oxygen deficit risks for children, shared a scientific research article on Facebook that found no link between COVID-19 cases and vaccination uptake, skipping the fact that the researchers' conclusion was to encourage vaccination (Bērziņa & Bite, 2021).

Thirdly, evidence, albeit anecdotal, has been published in the Latvian media. Teachers from Daugavpils, the second-largest Latvian city, stated advice not to get the COVID-19 vaccine from their family physicians as the main reason for vaccine refusal (LETA, 2021a).

Given the previous scepticism of Latvian HPs towards vaccine safety and recommendation at the doctors' level, as well as undermining of public trust in the seriousness of COVID-19, mask, and vaccine necessity at the organizational level, we believe the healthcare industry's hesitancy in Latvia could have left a mark on Latvians, too. Thus, in our research, we will examine whether such a theme of distrust by doctors is also apparent in social media content in Latvia.

### **2.2.2. Factors and concerns associated with higher COVID-19 vaccine hesitancy.**

Regarding the public, **sociodemographic factors** play a significant role in COVID-19 vaccine hesitancy, as shown by a biweekly longitudinal survey data from 5,660 individuals in the US (Szilagyi, 2021). Elderly, males, people with higher education, and white skin colour all showed a lower hesitancy. A drop in vaccination intent was observed, from 74% in April 2020 to just 56.2% in December 2020, so hesitancy has risen as people got less scared of the disease.

**Past influenza vaccination** was a statistically significant predictor of one's choice to get the COVID-19 vaccine in the UK study of 1,500 adults (Sherman et al., 2021). Those who got the seasonal influenza vaccine last season are much more likely to get the COVID-19 vaccine. While both these respiratory diseases are comparable, COVID-19 is more contagious, more likely to cause more adverse complications, and remains in the body for longer (Centers for Disease Control and Prevention [CDC], n.d.). Thus, if one already saw flu to be dangerous enough to get the vaccine for it, the same choice would be made for the riskier COVID-19.

**Trust in the government** is inversely related to COVID-19 vaccine hesitancy, found Lazarus et al. (2020). They ran a regression analysis of survey data from 13,426 people in 19 countries, including 6 European countries, in June 2020. Besides the lower hesitancy among the elderly, higher-paid, and better educated, they found that people who answered positively when asked whether they trusted their government were 67% more likely to accept a COVID-19 vaccine when compared to people who did not. Moreover, people who trusted their government were 4.35 times more likely to respond positively to a vaccination proposal by their employer. The importance of trust was also endorsed by Roberts et al. (2021), who found that in the UK, peoples' perception of how appropriate decisions the government has made regarding the COVID-19 crisis and how often the government told them the truth about COVID-19, were strong predictors of one's vaccination status. Thus, the less belief one has in

the government's information, the lower the odds of getting vaccinated. Given the development of Europeans' belief in local government, there has been a “waning trust race” in inoculating the people. On a 10-point scale, EU27 countries' average government trust was measured at 4.8 in April/May 2020 and was down to 3.9 by February/March 2021; in Latvia, the descent was even more aggressive, with values of 4.6 and 3.3, respectively (Eurofound, 2021).

It might be possible to split the COVID-19 vaccine hesitancy by **political beliefs**. Ward et al. (2020) focused on it in France by surveying 5,018 people in April 2020. Taking 2017 presidential election voters with no current political preference as a baseline, those who voted on either end of the political radicality spectrum or skipped the voting showed noticeably heightened vaccine refusal rates. Moreover, logistic regression analysis found a stronger relation to a different reason for the rejection of each group. Far-Right voters refuse due to negative views towards vaccination in general, Far-Left hesitate as they perceive COVID-19 to be harmless, whereas non-voters refuse due to worries about the vaccine development pace.

**Vaccine origin** is another way politics affect COVID-19 vaccine hesitancy. An experimental design survey of 1,942 adults surveyed in France in July 2020 showed French people would be 1.86 times more hesitant if a vaccine was manufactured in the US rather than the EU and 2.87 times more hesitant of Chinese over EU vaccine (Schwarzinger et al., 2021). The same study also showed that **vaccination location** matters; people's hesitancy decreased by around 20% if vaccination was expected to take place in a GP's office or local pharmacy rather than a mass vaccination centre. The authors demonstrated the estimated **efficacy** improvement from 50% to 90% would decrease the hesitancy by 64%, but not many gains can be achieved beyond the 90% border. Lastly, **past vaccine refusal, no chronic conditions, and low perceived risk** of COVID-19 were predictors of higher hesitancy.

One of the largest surveys on the unwillingness to get the COVID-19 vaccine was conducted in the summer of 2020, covering almost 20,000 individuals from 27 countries (Ipsos, 2020). Overall, 26% objected to the COVID-19 vaccine, of which 56% named **fear of side effects** as one of the reasons, followed by 29% who believed the vaccine to be **not efficient**, 19% thought getting sick with COVID-19 is **not risky**, only three percent mentioned a convenience reason: not having enough time. The country closest to Latvia in both geographic and economic sense included in the Ipsos survey was Poland. Contrary to average, 45% of Poles had no vaccination intention, 65% of these decliners were worried about side effects and 44% doubted it would be efficient, just 13% thought COVID-19 was not a big threat. It sheds the first light on how in North-eastern Europe COVID-19 vaccine hesitancy appears to be

higher than on average, with more worries about side effects and higher disbelief in efficiency despite lower complacency.

One of the COVID-19 hesitancy studies geographically closest to Latvia has taken place in Poland (Sowa et al., 2021). It analysed a representative sample of 1,000 Poles and especially focused on those 885 who had not received their vaccine yet. Excluding the overlapping factors found elsewhere, their most noteworthy findings were the association of higher COVID-19 vaccine hesitancy for people who **do not follow social distancing** restrictions, are **more religious**, are in **a better shape** (own perception of health and fitness during the pandemic) and show **a higher belief in COVID-19 conspiracy theories** (biological weapon created by a group that controls the world, scientists manipulate with information, government lies, vaccines have chips). COVID-19 conspiracy theories are something that appears worldwide; with a link between belief in them and vaccination uptake, we move on to analysis of what are some of the stories we can expect to appear on Latvian social media.

**2.2.3. COVID-19 misinformation and conspiracies.** In the COVID-19 debate, two closely related terms often appear: misinformation and conspiracies (or conspiracy theories), with a slight difference between the two. Conspiracy theory refers to the roots of a happening, defined as "attempts to explain the ultimate causes of significant social and political events and circumstances with claims of secret plots by two or more powerful actors" (Douglas et al., 2019, p. 4). Misinformation, meanwhile, is a broader term: "false information that is spread, regardless of whether there is intent to mislead," so it includes wrongful content regarding any element of the pandemic (Dictionary.com, n.d., para. 1). In practice, this means all the broad ideas of where COVID-19 appeared from or how it is used to change the world fall under conspiracies, while, for instance, guesses of case data misrepresentation or unproven, anecdotal claims of side effects, would be misinformation.

Conspiracy theories are something that predates the vaccines, starting with speculations about the origin of COVID-19 and continues to spread just like the virus itself (Zhang, 2020). To be fair against the vaccine hesitant, whose confidence in both government and vaccine safety has been hurt, official authorities have made some compromising missteps in handling the pandemic, giving traction to misinformation and conspiracies.

For example, the changing narrative of face masks, where health experts, hoping to prevent supply shortages for frontline medical workers at the beginning of the pandemic, told the public there was no need to wear a face mask or that they would wear respirators wrongly, frustrating people when face masks became mandatory (Tufekci, 2020). Or when the CDC



delivered faulty test kits, which took weeks to replace and dramatically reduced the US' testing capacity during the preliminary stages of the pandemic (Grady, 2020). Big pharmacy theory could have gained traction after it turned out one of the key officials in the US government's funded Operation Warp Speed designed to boost the vaccine development creation held 155 thousand Moderna shares worth \$10 million at the time, creating a conflict of interest (Sagonowsky, 2020). Another recent uncertainty considers the vaccines. Although initially, the CDC officials claimed the vaccinated incapable of spreading the virus, later the CDC admitted that a vaccinated person can spread the virus, even to other vaccinated individuals, and perhaps shortly after getting sick, they can be as contagious as unvaccinated people (Tayag, 2021).

Anti-vaccination movements are eager to capitalize on uncertainties and controversial news. Thus, in parallel to the pandemic, there is also something the WHO (2020b, para. 3) has labelled as "infodemic", an expansion of information abundance (in this context, COVID-19 related), mixing the truth and falsity. As people struggle to recognize the facts, the rise in general distrust partly relates to a growing number and popularity of vaccine-related conspiracy theories, making some question whether conspiracy C should be added to the 5 C's model of hesitancy (Mitchell, 2021). We briefly introduce the most frequent theories on social media as they are fewer than misinformation themes, which take various forms, like ex-president of the United States Donald Trump praising unproven medicine as a cure for COVID-19 or a presenter softening the seriousness of COVID-19 on public news (Ball & Maxmen, 2020).

First, there can be a misinformation gateway to the conspiracies. Dickson (2020) summarizes one of the most basic confusions as the question of the existence and scale of COVID-19. While in the most extreme case one disbelieves in COVID-19, which occurs rarely far into the pandemic, moderate cases are more frequent. People question whether an individual dies with or of COVID-19, speculating that COVID-19 deaths are getting overstated, the actual cause of death being an underlying disease. This idea pairs with the view that COVID-19 is just like seasonal influenza, it cannot be as lethal as "we are told" (Ullah et al., 2021). Then, as misinformation finds its place in one's mind, they start looking for a justification for why the state authorities would possibly want to inflate this pandemic, stepping into conspiracies.

Often, the "big pharma" theory is used to offer an inception point. It focuses on the argument that no existing medicine works against COVID-19 properly, enabling a few large pharmaceutical companies and scientists to make enormous, guaranteed revenues through developing new vaccines and even selling the existing "somewhat" helpful, hugely expensive drugs (Mills et al., 2020). It then extends to conflicts of interest, as some key government health advisors have either previously worked in the companies supported in the COVID-19 vaccine

development or hold stocks in them, and other corruption links between big pharmaceutical companies and governments. Some go as far as alleging pharmaceutical giants had the vaccines ready before the pandemic, hence it was possible to save years of vaccine development.

Another theory sees Bill Gates as a COVID-19 architect (Ball & Maxmen, 2020). Since this extremely wealthy man has gathered his wealth in the technology sector and has funded vaccine efforts, Biohackinfo.com put forward a claim that Gates is the mastermind behind the pandemic and will use COVID-19 vaccination to inject microchips into humans, enabling monitoring on an unprecedented scale. One of the roots for this theory is in Bill Gate's (2015) TED talk, where he suggests the next large event to take millions of lives will not be a war, but a highly infectious virus, warning the world was underprepared.

One more viral theory considers different variations of 5G technology linked to COVID-19 (Ahmed et al., 2020). Some note how shortly before the start of the pandemic 5G was launched in Wuhan, others believe 5G emissions have made humans weak enough to become susceptible to COVID-19, while others go as far as claiming the 5G towers themselves can emit the virus. Lastly, some people hypothesize that even if 5G is not related to the virus, COVID-19 is a distraction so 5G could be installed everywhere to, again, track people in fine detail.

In general, conspiracy theories and misinformation are the tools anti-vaccination movements use on social media to raise vaccine hesitancy. Since in this section we have described the main COVID-19 conspiracies that one might expect to see in Latvian speaking sections too, we take a step further to establish a link between social media COVID-19 conspiracy, misinformation consumption, and vaccination outcomes or at least intentions.

**2.2.4. Role of social media.** The Internet and social media have paved the way for possibilities to find like-minded individuals and share your views. As Wiysonge et al. (2021, p. 1) put it: "The speed of global information exchange has been significantly boosted by social media, leading to viral sharing of fringe opinions and disinformation".

The COVID-19 pandemic and the restrictions on physical gatherings that came with it boosted social media platforms that were previously plateaued. As real communication shrank, more people spent extra time online, and even higher engagement was recorded across all social media sites in 2020 (Williamson, 2020). What is more, approximately a 12% increase in social media usage during the pandemic has brought up the active social media users to 4.33 billion (Wright, 2021). Among all platforms, Facebook stands out as the dominating one used by 59% of all social media users (Williamson, 2020). Regarding demographics, Facebook's user base

is quite evenly distributed across most age categories, for instance, 24% of its audience are in the 18-24 age group, and another 10.4% are between ages 45-54 (McLachlan, 2021).

As for anti-vaccine communication on these platforms, Johnson et al. (2020) found that despite having fewer members, batches of anti-vaccination movements achieve prominent levels of intertwinement with unsure clusters of people online, while the pro-vaccination movement remains more peripheral. That can prove to be critical for reaching the desired levels of immunization as the proportion of COVID-19 vaccination unsure proportion is quite high.

Stating the three prime COVID-19 vaccine hesitancy motives, besides the government-supported rapid development (i.e., quality control doubts), and concerns about new mRNA vaccine technology, Wouters et al. (2021, p. 1030) tells hesitancy rises as “conspiracy theories about COVID-19 vaccines are being widely circulated on unregulated social media platforms, sometimes by highly organized anti-vaccination groups”. Moreover, researchers have confirmed a link between one’s belief in COVID-19 conspiracy theories and the decreased willingness to get the vaccine in the UK and China (Yang et al., 2021; Jennings et al., 2021).

Researching psychological features of COVID-19 vaccine hesitant individuals, Murphy et al. (2021) spotted a peculiar trend. Vaccine sceptics consumed less COVID-19 information from the official sources: newspapers, television, radio, and government agencies, a difference statistically significant at a 5% level. Simultaneously, vaccine opposers showed significantly less trust in COVID-19 news in these news outlets than the vaccine hesitant and accepting individuals. In turn, they relied more on information provided on COVID-19 on the internet and social media when compared to vaccine accepting people, also showing increased trust in messages carried from these origins.

Murphy’s et al. (2021) findings conform with a statement by Roozenbeek et al. (2020), who looked at factors affecting individuals’ susceptibility to misinformation. Summarizing findings from existing research, they highlighted how inflated mistrust in mass media and journalism, science and its practitioners, government, along with more conservative political stances, tend to foresee one’s elevated faith in misinformation. Thus, lower trust leads to belief in misinformation, which leads to lower vaccine uptake. This logical chain might be a big contributor to Latvia’s outlier status in EU COVID-19 vaccination rates.

As we have now mentioned the possible role healthcare specialists might be having in the COVID-19 hesitancy enigma, offered a list of other COVID-19 vaccine hesitancy contributors recognized by statistical research, pointed out how and what kind of conspiracy theories are a part of contributors, why social media is the place conspiracies paired with misinformation can spread rapidly and reach levels where they end up noticeably altering one’s

vaccination decision, we briefly introduce some of the stories an individual might face if decided to take a look at anti-vaccination content.

**2.2.5. The anti-vaccination content on social media groups.** In Poland, researchers examined comments written on posts of major vaccination events (COVID-19 vaccine efficacy announcements, registration of a vaccine, first vaccination in Poland) made on mass media Facebook pages (Wawrzuta et al., 2021). Besides themes generalizable to any vaccine, five new ones stood out. First, the vaccine is fake, public injections of placebo. Second, the vaccine was ready before the pandemic, the elites delayed the release waiting for the fear to grow. Third, the vaccine was developed too quickly, and only in a few years, we will see the health consequences. Fourth, looking for similarities to the swine flu vaccine, and the complications that followed. Fifth, pointing out how no one would take responsibility for side effects as pharmaceutical companies are freed from that, so how can there be any trust? The authors also pointed out how arguments can change rapidly as themes get outdated.

When creating a codebook for analysis of the main stories among COVID-19 vaccination opposers, Hughes et al. (2021) suggested that the narratives are built around a certain adversary. One of them was the group of government, health care system, and constitutional or wealth leaders combined as the crooked, powerful minority taking advantage of the majority, extracting benefits for themselves. Other examples were an unspecified villain, the society (vaccinated), or the vaccine itself, coupled with anecdotal claims and captivating images of the negative health outcomes the vaccine has created for some individuals. There were four main approaches in how the vaccine sceptics conveyed their messages. The first one is pretending to be a daring groundbreaker, heroically uncovering the secrets of suppressors. The second one is the “do your own research”, where the speaker attempts to motivate companions to compile their own proof to reach a conclusion predetermined by the speaker. The third is to emotionally overemphasize extremely rare cases of some (vaccine) risks and disregard the effectiveness of simple actions like hand disinfection, distorting one’s risk/benefit analysis. Lastly, just wrapping any information as the impression of how this opposition to the government is the way everyday people can regain freedom of their lives.

With a plethora of ways COVID-19 misinformation can emerge on social media and the variety of forms it can take, Facebook’s task of containing the falsities is unenviable. However, the company has taken numerous actions to improve the situation, including the feed algorithm adjustments to raise the factual COVID-19 posts and lower the untruthful ones, also attaching a misinformation cautionary mark. The next steps were stricter – deletion of posts

that back information disproven by health authorities, banning of anti-vaccine ads and users, groups, or pages for repeated misinformation sharing (Crouch, 2021).

Nevertheless, plenty of doubtful content passes the filters and both qualitative studies mentioned in this subsection provide examples of major themes identified in COVID-19 anti-vaccination communication on Facebook, possibly correlating with the ones in Latvia. Wawrzuta's et al. (2021) study is particularly interesting for the Latvian discourse due to the geographical proximity. Next, we provide background on vaccination in Latvia, and the ways it falls behind other European countries.

### **2.3. Vaccine hesitancy in Latvia**

In this section we will narrow our study focus to Latvia, set the background of vaccination attitude predating the pandemic, look at the existing COVID-19 vaccine hesitancy findings and how some try to benefit from it. Then we explain how social media in Latvia has been a hesitancy catalyst and summarize reasons that make Latvia a valuable research case.

**2.3.1. General vaccination attitude in Latvia.** Before the pandemic, data hinted at the potential vaccine hesitancy issue Latvia might run into. State of Vaccine Confidence in the EU 2018 research surveyed around 1,000 people from each of the EU 28 countries and found some alarming figures (Larson, 2018). Latvia placed second to last in the belief of vaccine safety as only 68.2% of respondents had the opinion vaccines pose no threat, only Bulgaria had less trust (66.3%), whereas the EU average stood at 82.1%. This percentage dropped even more regarding the views on the seasonal influenza vaccine safety, with just 55.2% of Latvians believing it is harmless; just France falls behind with 51.8%, while the EU average is 67.8%. It converts to influenza vaccination uptake, where only 11.7% of the elderly (65+) Latvians had the flu vaccine in 2019, one of the worst ratios in Europe (OECD, n.d.). Both the disbelief about influenza vaccine safety and low uptake, are especially alarming as past vaccination against influenza has been proven to be a strong predictor of willingness to get the COVID-19 vaccine in the UK (Sherman et al., 2021).

Larson et al. (2018) also noted that Latvians placed last in the belief of vaccine efficacy, only 70.9% thought vaccines are effective, trailing the EU average of 86.5%. They also found a link between religion and measles, mumps, and rubella [MMR] vaccine; Russian/Eastern Orthodoxy believers were less likely to say the MMR vaccine was important than atheists, suggesting the ethnicity issue might also be relevant to vaccine hesitancy in Latvia.

Given the link between lack of trust and lower vaccine uptake, Latvians' confidence in the government is a problem. Only 26% of Latvians tend to trust the government; just five other European countries have a lower level, whilst the EU average is 37% (European Commission, 2021). On the other hand, trust in national media in Latvia is above the European average, with 21% of Latvians having it high (versus the EU average of 19%) and 30% having low or no trust in media (40% average in the EU) (European Broadcasting Union, 2020).

The trust level of the official COVID-19 information in Latvia is in between the belief in the government and the media (Zvirbulis, 2020). In spring 2020, 63% of Latvians trusted the official information provided by the public authorities; in autumn 2020, this level had dropped to 53%. On average, the lowest levels of trust were found to be shown by people with low income (40%), secondary education (38%), and Russian native speakers (38%).

**2.3.2. Vaccine hesitancy in Latvia during COVID-19.** As of November 12, 2021, Latvia had the sixth-lowest full COVID-19 vaccination uptake among EU/EEA countries, with 76.1% of the adult population in EU/EEA fully vaccinated, but just 63.1% in Latvia (European Centre for Disease Prevention and Control, n.d.). August 2021 survey of 1,015 people point out similar sociodemographic factors associated with reluctance to get the COVID-19 vaccine as in other countries; less educated and lower-income people show a lot higher hesitancy (Kaktiņš, 2021). Residents of the countryside and cities other than the capital are more hesitant than individuals from Riga, while age shows no clear trend. The percentage of Russians who say they will “rather not” vaccinate is comparable to the Latvians (16% and 17%), yet there is a larger share of Russians who strictly refuse the vaccine (17% against 12% of Latvians).

A different survey published in August 2021 showed 27% out of 1,005 people do not want to get vaccinated against COVID-19 (SKDS, 2021). The same survey also showed 8% would like to choose a vaccine producer, while 9% were stricter and said they would only get vaccinated if they could choose the vaccine. Of these “vaccine choosers,” representing 17% of the public, 29.4% are waiting to get Sputnik V and another 17.6% want to get any Russian manufactured vaccine in general. In other words, of the overall public, about 5% are waiting for the option to get Sputnik V and another 3% just any Russian-made vaccine, showing how politics and ethnicity matter in COVID-19 vaccine hesitancy in Latvia. To further highlight this finding, fractions of vaccinated, unvaccinated, and vaccine choosers are split by ethnicities, which shows how both 27% of Russians and Latvians do not intend to get the vaccine, while the fraction of Russians who have at least started their vaccination falls behind Latvians by 16 percentage points. It is explained by Russians having a lot higher fraction of people waiting for

the opportunity to choose a specific vaccine. Therefore, possibly, Russians are not more vaccine hesitant per se, they are just waiting for approval of vaccines they believe in, driven by the affluence of following Russian media.

This highlights how important it is to address the Russian-speaking population to raise the trust in non-Russian-made vaccines. In October 2021, expert discussions in Saeima Commission on Citizenship, Migration and Social Cohesion concluded that the state language law limits the access to Russian-speaking part of the public (Spalvēns, 2021). That is, these people rely primarily on the Russian media; when addressing the elderly, it would be beneficial to use mail, yet the law prohibits public agencies to send writing in Russian. Even alternative options such as doctors or non-governmental organizations sending this letter in the name of the Government are impossible as it would count as delivery of unwanted information, and one cannot assume the recipient is a Russian speaker.

In Latvia, COVID-19 is also used to capture political gains. For example, ex-minister of transport and Latvian businessman (often labelled as an oligarch due to his political influence), Ainārs Šlesers, was one of the founders of a new political party Latvia First (Aleksejeva & Andriukaitis, 2021). By his side, he has gathered other COVID-19 vaccination sceptics. He and his party protest for “voluntary vaccination” and have organized protests with more than a thousand participants, despite the police’s warning not to attend them (Demidovs & Klūga, 2021). For instance, on August 18, 2021, more than four thousand protesters gathered, with speeches from Ainārs Šlesers, as well as Aldis Gobzems, another well-known politician who also has founded a new political party recently, Law and Order (Kozins & Demidovs, 2021). The campaigning, social media and vaccine hesitancy become even more intricate as politicians involve previously apolitical public figures in their plots. For example, Maija Armaņeva, Latvian Blogger and Influencer Association’s founder and president, has joined Šlesers’ political party, advertised the protests, spread COVID-19 denialism, publicly refused to wear a mask, and shared anti-vaccine information with her 70 thousand Instagram follower audience (Covidgudrie, n.d.). Likewise, there have been protests where people walk with Latvian flags and sing folk songs, adding a patriotism note to the issue (Ventas Balss, 2021; LA.LV, 2021). Therefore, with such low vaccination rates, historical background, and development of events, Latvia makes for a valuable COVID-19 vaccine hesitancy case.

### **2.3.3. Role of social media in the context of Latvia anti-vaccination movement.**

According to Diresta & Lotan (2015), anti-vaccination communication and organization occur online. The organization aspect has been apparent in Latvia several times when the previously mentioned large-scale pickets in the capital city were organized through social media

announcements, prominently from local politicians (Gobzems, 2021). However, experts note there is more behind these protests – people do not gather just because they support the ideas of the organizations. Instead, they are triggered by mistrust in the government and dissatisfaction with feeling ignored and disregarded (Kozins, 2021). Indicating protesters' aggressive attitudes are the deliberate attacks towards authorities – shattering of a police car window and assault of a police officer (Kozins, 2021).

This aggressive nature of Latvian anti-vaccine communities is facilitated by online communication channels. Kuške (2020) highlights and discusses the abundance of negative and aggressive messages posted on social media addressed to the Latvian government. She notes that overall attitude worsens as we get further into the pandemic and more restrictions are imposed. Additionally, the sometimes-flawed government decisions play a significant role and let people pick on the incompetence of the authorities (Kuške, 2020).

What highlights the fact of anti-vaccination communication occurring online is the high popularity gained by several Latvian social media accounts and groups focused on spreading vaccine misinformation. In fact, on August 17, 2021, one of the most popular Facebook pages “Vakcīnrealitāte”, distributing vaccine falsehoods to eleven thousand followers, was banned by the platform after numerous complaints by doctors and other platform users (Ārmane, 2021). Allegedly, this page had initiated aggressive behaviour in several patients and its activists even went beyond social media communication, printing and spreading deceitful flyers, trying to discourage people from getting vaccinated (Ārmane, 2021). After the ban, the creators were forced to adapt, actively posting on their website *www.vakcinrealitate.org*. Besides creating websites and organizing physical acts, another popular way vaccine hesitancy organizers avoid censorship is by utilizing the Telegram messaging service (Sprinģe, 2020).

Meanwhile, other Facebook pages and groups with anti-vaccine-focused content continue to operate. One of these is to our knowledge the most popular public Latvian Facebook group focused on anti-vaccination “PRET PIESPIEDU VAKCINĀCIJU” (translated “against mandatory vaccination”) with over 8,800 members.

Local news sources have particularly highlighted several other occurrences related to the COVID-19 anti-vaccine movement in Latvia. For example, how Arnis Ciminars, one of the founders of the party “Latvia First” which opposed compulsory vaccination, passed away at the age of 59 after being infected by COVID-19 (LETA, 2021c).



**2.3.4. Making the case for Latvia as a viable research ground.** To reiterate, in addition to the lack of existing research, multiple factors make Latvia a worthy COVID-19 anti-vaccination movement study field.

Up until October 2021, Latvia's vaccine uptake was an outlier not only in Europe but also in the Central and Eastern European countries' (CEE) context, which might be more relevant due to common past exposure to socialism and its trust implications. At the end of week 39, 2021 (3rd of October), 40.4% of Latvians had had at least one COVID-19 vaccine dose, ahead of only Romania (25%) and Bulgaria (17.5%) (European Centre for Disease Prevention and Control, n.d.). The other eight CEE countries, which are also part of the EU, were ahead, including Lithuania (55.6%) and Estonia (53%). Therefore, when relying on voluntary vaccination, Latvians have shown poorer willingness than their peers.

To battle the low uptake, the Latvian government has been one of the EU frontrunners in large scale compulsory vaccination requirements, starting with a demand for public sector workers, announced on October 8, 2021 (LETA, 2021b). While many European countries have implemented a proof of vaccination as a requirement for entering public venues or entertainment, for public or healthcare sector workers or for other critical professions, Latvia did it earlier than most and took a step further by demanding vaccination or proof of recovery for all on-site workers, with establishing rights for employers to fire any unvaccinated employees (Mumcuoglu et al., 2021). There is a risk of a backlash, unrest, and disturbance in belief in authorities when compulsory vaccination is used to fix low vaccination rates after ineffective government action in battling COVID-19 in other ways (Kirbiš, 2021, as cited in Furlong, 2021). Although vaccine mandates catapulted Latvia to having the second-highest fraction of "at least one vaccine dose receivers" among CEE countries as of week 4, 2022, social media content analysis can shed light on what anger cost this increase came.

Those left bitter with COVID-19 policies can seek "redemption" in the two newly founded political parties, Latvia First, Law and Order. With fading trust in top officials, as only 4% of Latvians fully believe in their announcements and another 18% "rather believe", new parties getting established with anti-vaccination slogans as their core value suggests politicians believe the vaccine debate is a significant catalyst behind the irritation of the voters (LETA, 2022). A look into social media could reveal what other worries accompany the anti-vaccination ideas.

### **3. Methodology**

This section describes the research design that is chosen to answer the research question. It goes on to explain and justify the data sources and data collection methods. Lastly, the dataset and analysis are described, and the methodology's limitations are acknowledged.

#### **3.1. General approach to data collection and analysis**

For our methodology, we looked at the approaches of other authors regarding vaccine hesitancy in social media research. An analysis by Franz et al. (2019) of 23 different qualitative studies related to health topics on social media found that studies employing passive analysis on Facebook employed datasets of 25-250 posts, 233-15,972 comments, and 1-840 groups or pages. Public data collection in such studies used both manual and automatic collection techniques. Automatic techniques include tools, such as Netwizz (Egdhdam et al., 2018), web-crawling services (Kent et al., 2018), CrowdTangle (Bruns et al., 2020), and others. All studies but one in the research by Franz et al. (2019) use manual coding as their means of analysis.

Facebook is continuously trying to protect its user data. One such action – the prohibition of automatic data scraping on their site without written permission. We were unsuccessful in our request for such written permission. Furthermore, the groups we are interested in are too small in member count for most scraping tools to work. Therefore, we have made a reasonable choice to collect data manually. Coding for the analysis part will be done manually, too.

The ability for users to comment and the possible inclusion of them in the research comes with benefits and drawbacks. Research has shown that the content and willingness to comment change when the identity of the commenter is public. Rhee and Kim (2009) found that removing anonymity from commenting reduces comment volume and length, resulting in fewer responses and less dialogue between commenters. Cho and Acquisiti (2013) found that non-anonymous comments exhibit less offensive content while Anderson et al. (2014) discovered that rude comments under articles contributed to the polarization of the perceived risks associated with the topic in question. On the positive side, an extensive analysis of 42 million comments by Fredheim et al. (2015) concludes that non-anonymous comments promote a more civil discussion focused on the topic in question rather than the author of a text. We believe that comments, despite their possible shortness due to the non-existent anonymity on Facebook, will still be a worthy addition to our analysis, so we include them in our data.

### 3.2. Research Site Selection

Looking at previous research specifically on anti-vaccination attitudes on social media platforms, we see a great diversity in the chosen methods (Smith & Graham, 2017; Bruns et al., 2020; Hussain et al., 2021). But when it comes to site selection, we notice a common trend - most research on this topic uses data from one or two social media platforms, predominantly Twitter and Facebook. Moreover, some researchers have shown even comments on just one Facebook post are enough for a study. For instance, Yip (2021) carried out a content analysis of 362 comments on the European Commission Facebook page posts relating to the COVID-19 vaccine over a 2-month time span. This further emphasizes that Facebook comments will be a valuable addition to our research. We also have decided not to split our focus and use solely Facebook for the data collection.

Considering our narrow research scope, we have chosen to analyse data extracted from Facebook. Having the broadest user base globally and being the most popular among social media platforms in the Baltics, Facebook is the main meeting point for public user-generated content about diverse topics, including the one we have taken interest in. Usage of other popular platform content, such as Twitter, was excluded because of the low popularity of this platform in Latvia. Twitter is used at least weekly by only 17% of all Latvian social media users while Facebook is used by around 82% (Degtjarova, 2019).

There is another prominent platform widely used for anti-vaccine communication. It is the Russian-originated Telegram, gaining popularity for its secure messaging which has made it a hub for cybercriminals (Murphy, 2021). We choose to exclude this research site from our analysis for two reasons. Firstly, there is a lack of statistics on the user count of Telegram in Latvia. Various sources cite Telegram as a widely unfamiliar platform in Latvia and its install count constitutes just 10% of that of Facebook as of 2021. Secondly, content on Telegram is available only for its users and lacks sharing features, significantly limiting the ability of the content to reach a larger audience and inviting like-minded individuals to join.

As of December 2021, 1,204,800 people use Facebook in Latvia, accounting for 65.2% of the population (NapoleonCat, 2022). Notably, the user count has increased by 3.5 percentage points since December 2020 and 16 percentage points since the beginning of the COVID-19 pandemic in Latvia in March 2020 (NapoleonCat, 2022).

Demographically the Latvian Facebook user base is balanced, slightly dominated by women (NapoleonCat, 2022). Although, interestingly, October 2021 was the first period when in the 25-34 age group men users proportionally dominated women users (NapoleonCat, 2022).

In the context of age, Facebook in Latvia is the most popular among users aged 25-34, followed by 35-44 and 18-24 age groups. Only below 4.3% of all Latvian Facebook users are under the age of 18 which means the content in our analysis is mostly generated by adults.

As our research site, we choose Latvian Facebook groups intentionally focused on anti-vaccination for COVID-19. We choose to collect textual data from Facebook groups because their main purpose is to present a separate way for people interested in a particular topic to interact with each other as opposed to pages, where content is posted only by organizations or public figures (Colaiacovo, 2021). It is important for us to analyse exactly this peer-to-peer communication aspect because, according to Johnson et al. (2020), anti-vaccine messages follow the pattern of being formulated as peer-to-peer communication while pro-vaccine ideas are more often expressed as expert-to-masses.

We collect data from Facebook groups selected by the following criteria:

- **Anti-vaccine focused** – Facebook groups in themselves had to be focused on objections towards COVID-19 vaccination. This could be manually identified by evaluating the group's title, description and looking at some of the posted content.
- **Public** – Data was collected only from public Facebook groups to avoid breaching data privacy laws. General Data Protection Regulation 2018 (GDPR) is a considerable restriction. Since the safest route of asking all post authors for their acceptance for inclusion in the research (informed consent) is infeasible, we rely on the specifications as to when such data gathering is lawful. We believe our research legality falls into the category of GDPR Article 6(1)(f) with data gathering being “necessary for the performance of a task carried out in the public interest”, i.e., to understand the thought process of a subgroup of Latvia's population, whose actions influence the COVID-19 pandemic course in the country. Besides, we do not collect any personal information on the post authors. Along with the publicity criteria, the groups had to be visible, meaning that anyone can find these groups by searching related keywords.
- **Local** – To remain within the scope of this research only Latvian groups were selected, identified by having the title and description of the group in the Latvian language. Within these groups, we see content in Russian, too. However, we exclude non-Latvian title and description groups from our sample due to the risk that the group participants are not Latvian residents and, therefore, their opinions are influenced by the circumstances in other, possibly Russian-speaking countries, being outside the scope

of this research. To our knowledge, there are no public vaccine sceptic groups for Russians in Latvia.

- **Popular** – Groups had to have more than 1000 members. Conformity to this criterion was identified in the site research process and based on the methodology of Smith and Graham (2017) who chose the same threshold for their site selection.
- **Active** – Groups had to have evidence of frequent activity and high user interaction identified by likes, comments, and shares with at least double-digit numbers on most posts to ensure groups were still actively updated and relevant for the members.

These criteria were necessary to select relevant research sites. Based on these criteria the two groups described in Table 1 were selected.

<b>Group title</b>	<b>PRET PIESPIEDU VAKCINĀCIJU (AGAINST MANDATORY VACCINATION)</b>	<b>Covid Vakcīnu upuri (Covid Vaccine victims)</b>
Abbreviation used	PPV	CVU
Date created	June 25, 2021	April 14, 2021
Number of members	8942*	6003*
Posting frequency	10 new posts per day*	28 new posts per day*
Interaction	Many posts exceeding 100 likes	Most posts with double-digit likes
Declared purpose	Fighting for optional vaccination in Latvia, calling themselves a national movement	Sharing vaccination experiences and side-effects, victims, and consequences
*As of February 6, 2022		

Table 1. Selected public Facebook groups focused against COVID-19 vaccination in Latvia and all the available metrics describing them. Made by the authors using data from Facebook groups (*PRET PIESPIEDU VAKCINĀCIJU*, 2021 & *Covid Vakcīnu upuri*, 2021).

The groups presented in Table 1 are the two most prominent Latvian anti-vaccine Facebook groups, the others are substantially smaller. The next largest groups conforming to all the criteria, except popularity, have fewer than 50 members and approximately 10-20 data units, most of which are created solely by group administrators.

Evidently, group PPV has a 49.0% higher group member count than the CVU group. However, activity in the CVU group exceeds that of PPV almost three times. Until autumn of 2021, there was another group fitting all criteria, but it was deleted by Facebook. Therefore, to our knowledge, these are the only two groups that have gained significant traction on the topic and are representing a substantial portion of anti-vaccination opinions in Latvia.

### 3.3. Data Collection and Overview

We use the manual collection technique to collect a novel dataset of textual data from the two Facebook groups. We choose only the posts containing textual content written by the person posting in the group. For every post in our dataset, we collect the following information:

- Textual content of the post
- Post type (either *post*, *shared post*, *shared article*, or *shared YouTube video*)
- Media type attached to the post (either *photo(P)*, *video(V)*, or none)
- Number of likes, shares, and comments (separately)

For each post in our dataset, we collect the comments, including only the textual content of each comment. We do not include comments with no meaning or idea that would be useful for our analysis, for example, plain, short rude outcries or comments consisting only of emoticons or other types of media. We exclude comment replies as they are not a part of the group's discussion but rather a longer conversation between two or more commenters, often involving personal attacks which have little to do with the anti-vaccine discussion. Thus, we include only the content relevant to the anti-vaccine discussion.

Timewise, we chose the periods between each group's creation and December 31, 2021, totalling in almost 9 months of data for PPV group and about 6 months of data for CVU group.

We started the data collection by scrolling down the group's feed and collecting data as Facebook does not allow filtering all posts within a certain time span. Because of the enormous number of posts and data, the computer ran out of RAM memory at 404 collected posts and comments from both groups. Approximate calculations showed that we would not be able to find a computer with large enough RAM memory to scroll to the very start of the group.

To overcome this obstacle and gain more meaningful content, we decided to use the possibility to filter out group posts using keywords. To identify the most popular keywords, we looked at the most frequently used keywords within the 404 data units we had collected. For that, we used Excel and ended up with 7681 different words from which we selected the three most frequently appearing nouns, namely “*vakcīnas*”, “*potes*” and “*vakcīnu*”, all of which are names for “vaccine”. Such keywords allowed us to avoid biases in data collection because they are neutral and none of them is pointing at a specific theme. This keyword neutrality also lets us avoid any biases created by extracting the keywords only from the most recent 404 data units, the maximum capacity of accessible posts without the use of keywords. We then proceed, filtering each group's posts by the 3 keywords one by one, and collecting the same information for each post and comment as before. This results in 1671 textual units being collected from both groups. Table 2 presents the number and type of data collected from each group as well as statistics on average engagement numbers and media frequency. We see that 73.3% of all data units were collected from the CVU group. However, the PPV group shows much higher engagement numbers. 66.2% of all posts use media to grab readers' attention.

To see the activity levels in both groups over time, we look at the number of posts posted each month since the group creation as shown in Figure 1. For both groups together we see the most data frequency in October through December and a large spike in May while posting activity seems to have decreased in the summer months - June through September. Distribution is not consistent among both groups as PPV shows a notable spike only in December and almost no activity in August. CVU shows a notable spike in May and almost no activity in August.

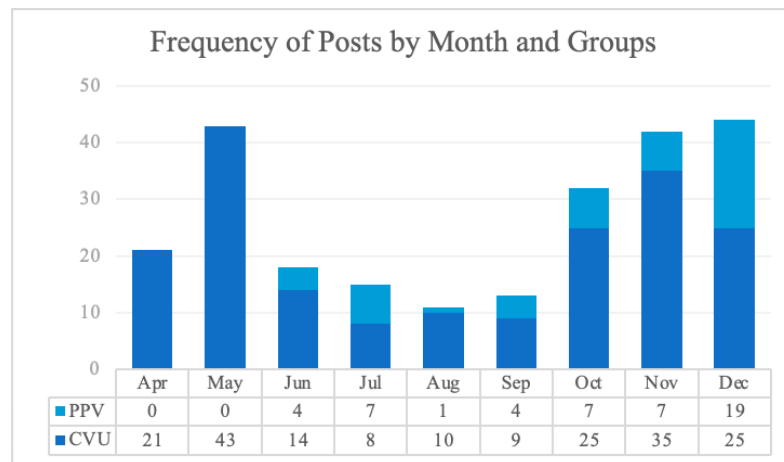


Figure 1. Diagram showing the number of posts included in our dataset from each of the groups by months of 2021. Made by the authors using data collected from Facebook.

	<b>Covid Vakcīnu upuri</b>	<b>PRET PIESPIEDU VAKCINĀCIJU</b>	<b>Total</b>
Total collected data units	1226	445	<b>1671</b>
Number of posts	189	48	<b>237</b>
Number of comments	1037	397	<b>1434</b>
Average number of likes per post	60	101	<b>68*</b>
Average number of shares per post	45	446	<b>127*</b>
Average number of comments per post	29	39	<b>31*</b>
% of posts having media attached	60.8%	87.5%	<b>66.2%</b>

\*Weighted average

Table 2. Descriptive statistics of the manually collected data of each of the two selected Facebook groups used in the analysis. Made by the authors using data collected from Facebook groups (*PRET PIESPIEDU VAKCINĀCIJU*, 2021 & *Covid Vakcīnu upuri*, 2021).

25.2% of Latvian citizens are Russian by ethnicity (CSP, 2018). Consistently, 18.9% of the posts and comments in our dataset collected from the PPV group are in the Russian language. However, only 2.7% of posts and comments from the CVU group are Russian which lowers the total Russian data unit percentage in our dataset to 7%. To our knowledge, there are no Latvian Facebook groups exclusively using Russian language, so there is not enough data to create a separate Russian language section in our research. However, excluding the data in

Russian language collected from Latvian groups would cost us some valuable insights. Being an ex-Soviet Union country, Latvia's population generally speaks and understands Russian language even if it is not their native language. This is evident in several instances in our data where replies to Russian posts comments were voiced in Latvian. Therefore, we address this language gap in our research by including the Russian textual data in our analysis, using our language knowledge as the primary tool, supplemented with Google Translate for more advanced terms. When analysing, we do not separate this data from the inputs in Latvian.

With regards to ethics, researchers emphasize the key factor is that no person should face any damage due to inclusion in the research (Mancosu & Vegetti, 2020). We do not collect the author's names and draw our conclusions from the masses, not stories of individuals with their real names. Thus, it is unlikely an individual might get harmed due to our actions; without the inclusion of names, our research does not leave them any more vulnerable to condemnation than they already do themselves by voicing their opinions publicly using their personal profiles.

### **3.4. Data Analysis**

Our data analysis approach follows the six-step thematic analysis framework charted in a highly cited article by Braun and Clarke (2006). Firstly, as also described by Nowell et al. (2017), the dataset should be read at least once before coding to ensure trustworthy and rigorous analysis through familiarization with the to-be-coded data. Therefore, we each actively read through the dataset once before coding.

Secondly, the coding. As mentioned, we code the data manually. A critical reason for choosing manual over automatic coding is the language barrier as most quality automatic coding algorithms can only analyse the English language while our dataset is a mix of Latvian and Russian languages. Building our own tool would be infeasible. Furthermore, we believe our data is distinctive and manual coding provides us with more insightful connections and conclusions. For coding, we use NVivo 12 software.

To develop the codebook, we randomly choose 200 collected posts and comments from both groups. Each of us independently codes 100 data units, guided by the appearing content. We proceed with discussing our codes and establishing by consensus the codebook of 27 codes. Appendix A presents every code and its description. Finally, we divide our dataset into two parts with one researcher coding 865 posts and comments and the other one coding 806.

For the third step, theme seeking, we use a deductive approach, mapping the codes into existing vaccine hesitancy frameworks and its supplementary themes as hesitancy in the healthcare industry, trying to utilize the literature we have collected (Braun & Clarke, 2006).



However, in the fourth step, theme review, we recognize that not all our codes fit into the existing frameworks. Hence, we apply an inductive approach, too, creating new themes dictated by our dataset. Then we define and properly name the new themes in the fifth step as we prepare for the writing. Lastly, we report our analysis in the writing – structured on the solid foundation of the 3C and 5C vaccine hesitancy frameworks where possible and separately for the themes, arguments and complaints that did not fit the established structure.

### **3.5. Methodology Limitations**

The benefit of using public data is that there is a lot of data for a variety of health-related topics, and the participant's informed consent is not required. However, due to social desirability factors and other censoring by the user, the public data could be biased as people get concerned about their privacy and are cautious of the audience. Therefore, the data we analyse are lacking the opinions of those cautious about their disclosure and image on social media. Nevertheless, people do create fake profiles to express such information, and our dataset likely contains data from such profiles because of the frequent callouts post and comment authors made mentioning the existence of such profiles.

Some comments are visibly mocking the conversation, such as “I regret getting vaccinated; already for two months have been stuck to the fridge’s door and cannot get off” when talking about potential vaccine magnetism. In other cases, it might not be as obvious the person is not serious, so we try to use our judgement to recognize these cases. Yet we believe they do not distort our analysis and main themes too extensively.

Another aspect to consider is our focus on textual data which limits our analysis scope. Social media habits research shows that the most widely consumed content among Latvians is video content (Djegtjarova, 2019). This is apparent also when scrolling through the selected group content – a sizeable portion of the posts contain videos. While manually collecting the information, we noticed that while resharing video content is popular, it is often done without adding additional text, almost as if the “video speaks for itself”. This is justified by the fact that only 14.6% of all posts in our dataset that contained media were in the form of video.

Similarly, we omitted picture content, limiting the identification of the themes apparent in the visual part of the post, but not in the textual. Although we collected the emoticons which were part of the textual content, we did not highlight emoticon use in any way in our analysis.

Next, our research focus is COVID-19 anti-vaccination groups, which were established after the announcement of a vaccine. Thus, our dataset excludes conversations from the early pandemic stages, which could contain more disease denialism, a complacency factor.

Overall, we acknowledge a considerable portion of observations is lost due to our inability to investigate the “invisible part of the iceberg”, namely, private Facebook groups or non-social media sources such as Telegram or WhatsApp groups, which affects the generalizability of our results. Yet with a research topic as delicate as ours, there is a trade-off between accessibility and research ethics, prohibiting us from inspecting non-public sources.

## 4. Results

In this section, we overview the qualitative analysis results and the supplementary statistical data collected for each post - themes’ appearance fluctuations.

Firstly, we look at the frequency of the codes using the hierarchy chart presented in Appendix B. “Death,” “conspiracies,” and “government” appear as the most frequent ones followed by “children,” “criminal,” “resistance,” and “foreign countries”. The codes for “doomsday,” “religion,” and “restrictions” appear the least.

Secondly, we create a node matrix presented in Appendix C to explore the relationships between codes. We see that the strongest relationship by far exists between “side-effects” and “anecdotes”. This indicates that personal stories written about own, or others' experiences often include mention of health problems reportedly caused by the COVID-19 vaccines. Three other strong relationships exist between “death” and “conspiracies,” between “death” and “children,” and between “side-effects” and “conspiracies”. These are closely followed by relationships between “death” and “anecdotes,” and “government” and “economic gains”.

We further advance on the relationships between codes by looking at the horizontal dendrogram of the cluster analysis of the codes using Pearson's coefficient presented in Appendix D. Apart from enhancing some of the previously seen relationships, it also allows us to identify “religion,” “doomsday” and “denial” as the codes most isolated from other topics. The group of the most closely related codes coloured in yellow presents interesting relations between “government,” “criminal” and “resistance,” pointing to the direction that government is associated with criminal doings and is the main power that the anti-vaccination community invites to resist. The dendrogram shows “economic gains” being related to both “government” and “healthcare” pointing in the direction of the believed beneficiaries of COVID-19 vaccines. It also shows “conspiracies” being most related to “foreign countries,” “healthcare” and, of course, “death” rather than the government.

Next, we used NVivo case classification and attribute functionalities to segregate the frequency of codes appearing within each of the months of 2021 in our dataset to see how the

codes transform over time. We segregate data by months to identify whether there are any trends we should consider when discussing our results. Figure 2 presents the 12 most frequent codes mapped out by months. We map only 12 out of 27 codes to enhance the graph readability.

The code distribution changes monthly; only the code for “death” remains a stable basis among all months and “side-effects” starts to appear just from May. As the sum of the Top 12 codes steadily increases in share over time, we may say that the scope of discussions seems to narrow down a bit, furthering the existing themes and excluding the less popular ones.

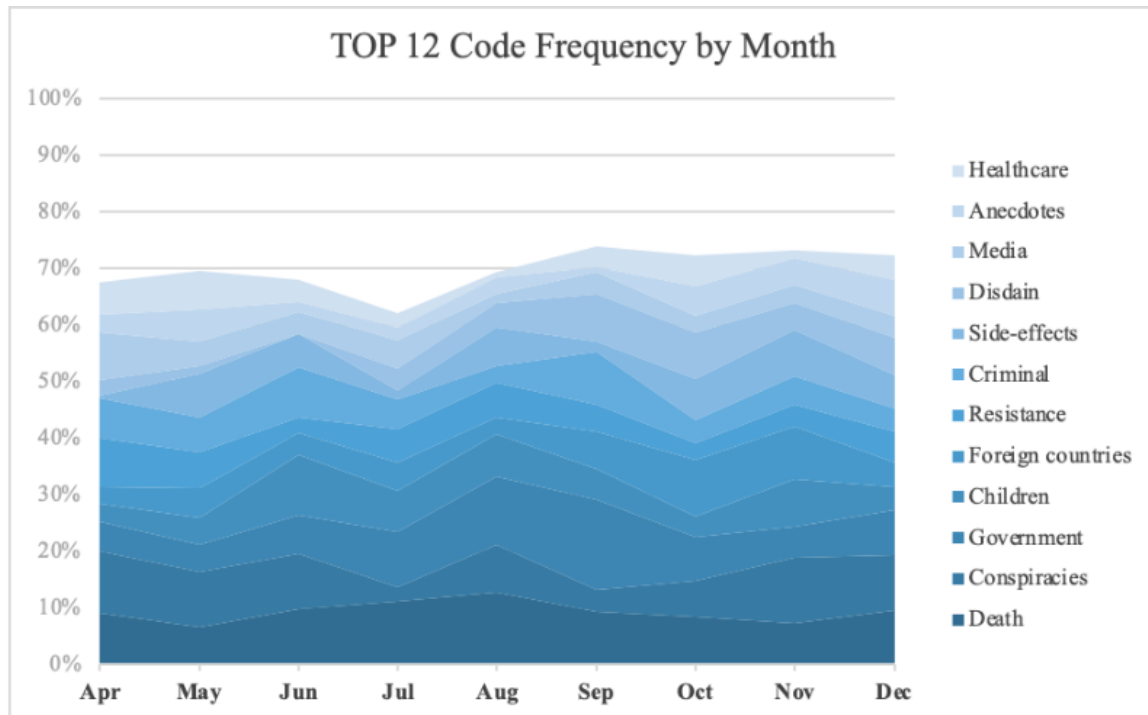


Figure 2: Top 12 code frequency by months of 2021. Made by the authors with the help of NVivo 12 case classification and attribute functionalities.

To explore the code distribution further we extract the 4 most frequent codes from each month and graph them in figure 3. Throughout all months Top 4 codes constitute more than 30% of all codes. Code for “death” makes it to the Top 4 almost every month with a spike in frequency in the summer months. “Conspiracies,” on the other hand, significantly decrease in popularity in the months of July and September while “government” is more talked-about in July, August, and September when it reaches a peak of 15.89%. This peak was driven, in part, by an abundance of reactions to a video of the Latvian prime minister's outrage towards the stagnant pace of vaccination against COVID-19, blaming the health minister for it.

“Side-effects” are among the most popular topics only in May and November. Meanwhile, “children” are talked about the most in the summer months leading up to the start of school and “foreign countries” are a hot topic in October and November. Meanwhile, “healthcare” and “media” are only popular in the first months of group creation.

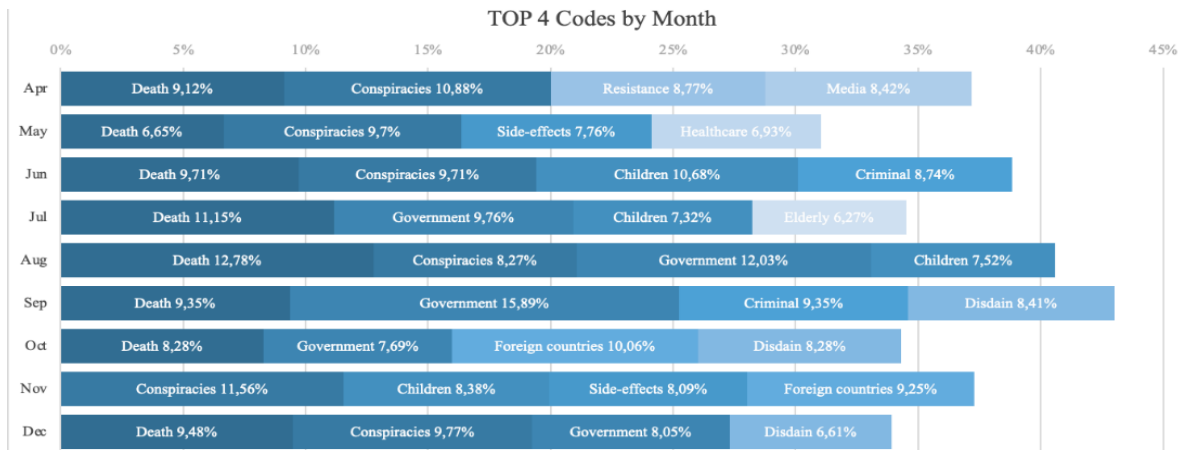


Figure 3: Top 4 codes by months of 2021. Made by the authors with the help of NVivo 12 case classification and attribute functionalities.

To further our statistical exploration of the data, we use cross tabulation of code appearances split by the two Facebook groups, looking to spot any differences (Appendix E). It is crucial to remember we collected 2.8 times more data units from “Covid Vакcīnu upuri” (*Covid Vaccine victims, CVU*) group than from “PRET PIESPIEDU VAKCINĀCIJU” (*AGAINST MANDATORY VACCINATION, PPV*) group. Hence, for a code to be similarly common (in relative terms) in both groups, it should be coded approximately three times more (in absolute terms) in CVU than in PPV. This arithmetic is also supported by the fact that, overall, we have 3.1 times more code appearances in CVU group than in PPV.

We notice various/some/a few notable disparities. Firstly, CVU group is substantially more inclined towards side-effect and anecdotes, with 18 and 15 times more occurrences than in PPV group, respectively. Practically, this means scrolling through CVU instead of PPV, you would come across informal stories of supposed vaccine side effects five to six times more often. On a related pattern, we coded observed 7.4 times more data units containing conspiracies in CVU, thus, one is about 2.5 times more likely to observe a conspiracy-related post in CVU than in PPV. Healthcare industry’s criticism was relatively about 1.5 times more common in CVU than in PPV. Less frequent codes suggest CVU group members are also more likely to raise data misrepresentation claims and discuss information found in the media.

From the opposite side, PPV group’s content is considerably more government related. Its posts and comments contained almost equal count of government criticism as CVU, but given the small data sample, it equates to about three times higher relative prevalence. As we will later explain, suspicion towards statesman is linked to the question of corruption and who obtains financial gains from COVID-19 pandemic. Thus, it comes as no surprise “economic gains” code is relatively about 80% more frequent in PPV than CVU. Also, as the group’s name suggests, it was created to combat vaccination becoming compulsory. While Latvia’s

laborers already faced a form of it through vaccination certificate mandates for on-site work, economically inactive people were not affected by this directive. Therefore, in PPV group, codes “elderly” and “children” are relatively 152% and 42% more recurrent than in CVU as these are the parts of society PPV’s members are trying to “protect”. Qualification questioning was also comparatively more typical in PPV. Curiously, PPV have no “opposition” code occurrences, meaning its posts and comments are either so explicit that no one questions other members’ trustworthiness, or censorship exists, deleting conflicting (pro-vaccine) remarks.

Generally, it appears that both Facebook groups’ names included in our dataset are justified. Each is focused on a different angle of COVID-19 vaccine debate, which explains the need for two anti-vaccine groups instead of one larger one. At the same time, prominent codes such as “death”, “criminal”, “resistance”, “foreign countries” and “disdain” are relatively quite similar in their recurrence in both groups. This suggests that despite the differences in key purpose, both groups employ homogenous methods: emotionality, exaggerations, calls to oppose and comparisons to the situation abroad.

## 5. Analysis

In this section we are going to discuss the results of post analysis from the Latvian anti-vaccination groups, mapping them within the proposed vaccine hesitancy frameworks from the existing research. Then we summarize the main conspiracies circulating in the groups. We look at whether healthcare personnel hesitancy and politics do appear in the content shared by vaccine sceptics. Next, we look at the emotionality that surrounds the posts and comments, as well as the importance of actions taken by foreign countries.

### 5.1. 3C’s of Vaccine Hesitancy Framework

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From the framework of 3 Cs of vaccine hesitancy, the **confidence** debate comes ahead as the most vocal. As it looks at the question of trust, the most significant keyword in this analysis, content relevant for this C lies within our most populated codes. “Death,” “conspiracies,” “immunity,” “side-effects,” “anecdotes,” “experiment” and “healthcare” all deal with various aspects of disbelief in vaccine safety, personal stories of side-effects, links to death, theories of how they harm people, are experimental due to lack of proper testing during the development process. Here is an example of an anecdotal story that boldly links the COVID-19 vaccine to a health complication of an otherwise healthy man:

About an hour ago I was a witness to a possible C19 vaccine victim. A man, 54 years old, got the vaccine in May [the post was written in August], athletic, relatively healthy, as I understood,

was even running marathons. Today he was participating in the local county running competition. After running less than a kilometre, he started feeling sick, I was there and called the ambulance. He was complaining about a pressing feeling in the head, had difficulty breathing. The ambulance arrived after half an hour, during which the man lost consciousness twice. Unfortunately, I have no more information now. The ambulance took him to the hospital.

Note the reference to “a man” in the quote. It is a common practice to indicate someone else, such as an “acquaintance”, “colleague”, “friend’s sister and her husband” or “father’s classmate” as the one who had the discourse, unpleasant vaccine side-effect or death.

Relevant to vaccine confidence, health risk codes were the most frequent, followed by “disdain” (a proxy for vaccine inefficiency as the jabs are ridiculed) and “denial” (a proxy for disbelief in the seriousness of COVID-19). Assuming these translate into reasons why vaccine hesitant are not vaccinated yet, the order of the three motives equates to the statistical findings by Ipsos (2020). Our study design did not allow us to confirm Schwarzingner’s et al. (2021) conclusion of vaccine origin as a doubt factor as we did not find any evidence of individuals waiting for the Russian-made Sputnik V vaccine, unlike in SKDS (2021) survey.

In addition, the aggregation of codes “government,” “conspiracies,” “criminal,” “media,” “healthcare,” “economical gains” and “data misrepresentation” touches another side of trust. It considers the disbelief in the pure care of the government, how they have influenced the doctors with “perverse incentives” due to the monetary reward GPs receive by vaccinating their clients, how the media is forced to spread fear within the people using statistics that have overstated COVID-19 cases and downplayed vaccine risks. It stretches as far as complaints about how doctors neglect anyone’s health conditions as increased risk factors that might render them ineligible for vaccination. An example of an alleged conversation:

My relative asked the family physician, whether he can receive this injection even if he has asthma. Do you know what the doctor replied? “They [government] will force everyone!” What do you think comes next?

Another telling example of a doubt-inducing post can be seen in Appendix G. After inducing sympathy by mentioning a journalist's mother’s death, the content demonstrates how the government and health authorities’ narrative always has a way of bending the situation in a way to show portray vaccines in a good light, while making COVID-19 appear threatening. As the post covers a range of statements, there is a larger chance that an individual might resonate with at least one of them, catching readers’ attention. And then, when so many pieces are put together, the hesitancy thought might grow – how is it possible, that every part fits the story of vaccine as the sole answer, the only viable choice in beating the pandemic?

Propositions of what has led state leaders to initiate this “farce,” which often includes financial incentives from influential outside entities and calls for all oppressors to (eventually) take responsibility for the harm they have caused and get imprisoned are also part of the narrative in this category. Such distrust in the authority motives as a vaccine hesitancy cause is consistent with the recent findings of Lazarus et al. (2020) and Roberts et al. (2021). Moreover, it quite closely resembles the antagonist's story identified in Hughes et al. (2021), where the “alliance” of the establishment, medical industry and news were the ones to blame for the pandemic.

An interesting code tying together both vaccine and organizational distrust is “qualification.” Vaccination sceptics are eager to point out the incompetence of the speaker or person presenting the information. Vaccination encouragement by Jānis Dombrova, member of parliament, was met with a stingy:

Dombrova, tell me please, the location of your FAMILY PHYSICIAN'S PRACTICE? Are there any free places or are you serving the patients in Saeima? I have missed the law that states members of parliament have started to perform the duties of a doctor.

Vaccine endorsement by comedian and TV personality, Baiba Sīpeniece-Gavare, re-shared in the anti-vaccine group, received comments like: “What is she chattering? Is she a medic?” Moreover, vaccine sceptics claim family physicians do not know the vaccine ingredients, which makes them invalid for suggesting any vaccination. Sarcastically put by one commenter: “Chefs must know all ingredients of a food recipe, yet doctors do not need to know anything about the vaccines.” These narratives peak at the claim that in fact, there are no vaccine research experts in Latvia, leading to illiteracy among Latvian HPs and authorities about what are they even injecting the people with. Qualification questioning also includes the testing procedures and delivered vaccine quality.

The second C, **complacency**, plays a secondary role, at least in our research period, when the pandemic is already in a mature phase. Code “denial” is at the heart of complacency, with “immunity,” “media,” “anecdotes” and “data misrepresentation” codes also holding some relevant content for the second C. Denialists insist Covid is either common cold, flu or pneumonia, depending on the seriousness of the symptoms. Some ironically call it the “modern flu” while others pair it with publishing, calling it the “media flu”. An illustration of a typical complacency post: “Everyone’s [acting] like small children, do you not know what the flu or pneumonia is: the same symptoms and mortality.” Another comment adds misinformation: “COVID-19 is FLUuuuuuuuu. When are people finally going to understand it and that the new omicron is nothing more than vaccine side effects, a way to hide adverse secondary reactions.”

Prior to the omicron strain wave, many still claimed they do not personally know anyone who has had COVID-19; hence this is a “media pandemic” based on falsified morbidity rates. Lastly, some anecdotal evidence circulates about people “knowing unvaccinated elderly” who have gotten through COVID-19 easily, so there is no need to exchange the strong natural immunity for an artificial one that must be renewed every couple of months.

Illustrations of data misrepresentation claims include: “For almost two years, flu patients and victims have been and still are added to the COVID-19 monster!!” or “Latvia has no registered vaccine fatalities - of course, all those victims were reported as dying of heart failure, thrombosis, or anything else, only the vaccines have absolutely no connection here.” One Facebook user bluntly wrote: “From a close acquaintance... There is info from trusted sources of over 1000 deaths after getting the vaccine in Latvia.” All these short posts undermine one’s trust in what the actual numbers are, the scale of the pandemic and the desire for vaccines.

The third C, **convenience** factors, barely made any appearances in the Facebook groups. One explanation is that vaccine sceptics are usually so hostile towards vaccination that there is no point in discussing minor inconveniences like missing work for a couple of days due to after-shot fever if you believe the vaccine will kill you. Another factor might be that Latvia has made vaccines so effortlessly available that this is no longer a concern. Or it might be due to selection bias; those who live so remotely that getting the vaccine is a challenge are not part of the anti-vaccination groups or might not even use the internet.

## 5.2. 5C’s of Vaccine Hesitancy Framework

Adding the other two Cs to the model, **calculation** is the more relevant one. Yet it is quite far from neutral vaccine comparisons and mRNA vaccine mechanism explanations. Vaccine brands only appear in the anecdotal evidence about side-effects but are irrelevant otherwise as all of them are seen on a scale of “useless” to “lethal.” For risk-benefit analysis, people would often refer to “foreign websites,” where COVID-19 risks are minimized, vaccine risks inflated, mass media is seen as “zombification”, and scientific research is “the big pharmacy sponsored lie”, hence the decision-making process is extremely skewed. The new mRNA vaccine mechanism, due to rapid development, is almost solely referred to as an “experiment.” One commenter puts forward their opinion against forced vaccination:

Vaccination rules are NOT applicable here, because this is NOT a vaccine, but experimental “medicine”, which is still “researched” in stage 3 clinical trial. Therefore – just and only VOLUNTARY participation in a clinical study with an experimental substance, where no one



else besides the experiment participant is taking the full responsibility for the consequences of exposure to this substance.

Although the previous comment seems quite intense, it represents the attitude visible in plenty of short comments. Judging from the quantity of posts in the code “experiment”, many truly believe vaccines are a weapon. Someone manages to push the outlook even further:

What one family physician said. She is not getting vaccinated, because she does not know when and which batches will be delivered, she does not want to risk it!!! I translate it as a clear experiment with people. They vary the vaccine contents, pour in more of something and less of something else, that is why there is so strict batch stock-taking. Then they are monitoring, from which [batch] people are going to be “pushing up the daisies” and from which not. Through lies, they are forcing people to participate in medical experiments.

If vaccine sceptics did think in terms of the last C, **collective responsibility**, they did not write it publicly. In the few relevant entries, the temperament was the opposite. Vaccinated people are blamed for “taking the effortless way out” instead of fighting against the oppressors. When heavy vaccine side-effects are mentioned, vaccine sceptics wonder whether those affected will be satisfied by having “sacrificed themselves for the common good”. Lastly, some are irritated by the idea of “being vaccinated not even for their own health, but to protect others” after it became apparent the COVID-19 vaccine will not have the promised high efficacy.

### 5.3. Conspiracies and misinformation

Another possible C that should not be overlooked is conspiracies, paired with common misinformation topics. The main ones:

- Latvian government has taken money from the EU; therefore, it must vaccinate a certain (high) fraction of citizens to keep the money.
  - Other variations include falsification of COVID-19 cases upward to receive more funding from the EU.
  - Implies the corrupt authorities are keeping a fraction of these payments.
- Vaccines are created to solve the overpopulation problem, some are receiving certain death dose, others just placebo, because “it would be too suspicious if everyone died”.
- Vaccines contain microchips, the motivation for that is open for interpretation.
  - Government collecting data.
  - Bill Gates and Microsoft have a deal with Pfizer, so they could track data, regulate body temperature, make people choose their products over Apple.
    - As a response, it is rumoured that Apple will team up with Moderna.

- The Big Pharmacy industry is behind COVID-19 because it means an enormous stream of revenues. Companies have been "subsidizing" doctors for a long time to prescribe their drugs. They gain control over governments by bribing or threatening to cease investments or move factories to other countries, creating unemployment.
- People reporting various symptoms like increased miscarriage risk, delayed or intensified period, nosebleed, nausea, headache, rash, and weakness after spending time next to vaccinated individuals. Some go as far as claiming the vaccinated emit radiation.
- Masks and COVID-19 test sticks contain graphene threads, which can be discovered by holding both in hot water. We breathe the threads in. Besides the cell damage from graphene, it also causes magnetism in people.
- It will take multiple years for vaccination side effects, and deaths to appear; consequences that were overlooked due to shortened testing period.

Overall, Latvian anti-vaccination groups are covering most of the central COVID-19 conspiracies noted in the research, except for the 5G doctrine, which missed our dataset. When compared to Polish vaccine opposers researched by Wawrzuta et al. (2021), there was some overlap in placebo jab, uncertain future complications, and no accountability.

#### **5.4. Politics and healthcare system's role**

As explained in the literature review, the media shows a high degree of politicization of COVID-19 handling. Yet no political discussion on anti-vaccine content was present in our dataset. Indirectly, opportunistic politicians could draw conclusions from the "resistance" code - an abundance of people are willing to take their rage in the streets, but there are no signs of whether the protest organizing will translate into support during the next elections.

There were few indications of healthcare practitioners' doubts as a spark for individual's vaccine hesitancy. However, there was an intense discourse on doctors' attitude, qualification, and incentives, as well as the healthcare system's poor handling of the COVID-19 crisis. We explore these themes in the following sections.

**5.4.1. Doctors' scepticism.** Exploration of Latvian anti-vaccine Facebook groups generated sparse evidence of vaccine scepticism among Latvian healthcare practitioners and had to be implied from the doctors' communication. For example, one person claimed to have spoken to an infectologist from the Children's Clinical University Hospital in Riga. In the conversation, the specialist had revealed that over the course of one year, eighty children have been hospitalized with a mild or very mild case of COVID-19, while only two required intensive care. Thus, a seeming implication: disease risks are low, the vaccine is unnecessary.

The example of the doctor saying everyone will be forced to get vaccinated is also relevant here and has multiple implications. Firstly, doctors might feel helpless; their judgement of patients' suitability for the vaccine does not appear to matter. Secondly, the patient might be left with uncertainty and worry of possible health deterioration linked to the COVID-19 jab if they do get one or left with shattered trust in government and raised willingness to resist if they choose not to get vaccinated.

The powerlessness theme is outlined further in another story. Due to the mandatory vaccination, a lady employed by the National Armed Forces is forced to get the COVID-19 jab to keep her job. However, because of her ulcerative colitis, she seeks a medical certificate from her family physician to prove she is incapable of getting the COVID-19 vaccine. The doctor does not assign the document, stating that he/she would be held accountable if the medical certificate holder died of COVID-19. If true, criminal responsibility would explain doctors' reluctance to hand out such documents and, as the source of this anecdote says, shocks that "no one, from the drug industry to government to Bill Gates" is not held responsible, but the doctors. The source also adds that, on the other hand, if the person died from vaccine complications that the doctor was aware of beforehand, no punishment would ensue. This initiates an adjacent pattern in anti-vaccine groups, vilification of doctors.

**5.4.2. Doctors as villains.** Reproaches toward doctors are to diverse degrees. On the gentler side, dissatisfaction with delays or no calls at all from the family physicians after a positive COVID-19 test or shock about how quickly after vanishing of fever sickness-leave is terminated. Another aspect is forcefulness from family physicians for their patients to get vaccinated. For example, a person agrees with their parents' family physician to delay the vaccination as the two elders are currently too ill. However, soon after, one of the elderly calls to utter: "Notwithstanding, we got inoculated." Two days later, the mother was hospitalized and a week later died in the hospital. There are also remarks on how many doctors do not even know the content of the COVID-19 vaccines they are inoculating. Others claim doctors know about the harmful ingredients, but the government has given orders not to disclose anything.

By far the most occurrent theme, corrupt doctors' narrative, offers a rationale for persuasiveness. That is, many commenters refer to bonuses received by GPs for injecting the COVID-19 vaccine, especially for the elderly, where, depending on the uptake among the 60+ age group and the chronically ill clients, the reward can reach up to 30 euros per jab (Ministry of Health, 2021). Vaccine hesitant perceive such incentives as bribery, turning GPs into "thoughtless murderers, trying to inject the poison (vaccine) at any cost just to get the government money." For example, someone expresses it as follows:

About vaccination: a large fraction of medics live in clover because there is a premium paid for caring for the COVID-19 patients; I also heard rates for getting the fact of vaccination without getting the “wonder-vaccine” itself, 50 to 100 euros. Looks like many will use that because the government’s dream is to inoculate as many as possible and they will be looking for ways to subject or impose sanctions on those who refuse the vaccine. But otherwise, not too bad income, 15 minutes and 100 euro for the doctor’s practice for a paper and then some additional payment from the state, not a bad business.

Others pair this with Big Pharma conspiracy; what had been doctors’ prescription of certain drugs to receive a cut has now turned into a forced vaccination business. One Facebook post explained how a person’s GP wanted to vaccinate with Pfizer–BioNTech COVID-19 vaccine, while the person wanted to get the Johnson & Johnson jab. The doctor was very reluctant and brought out two A4 pages of Johnson & Johnson’s vaccine side-effects, while saying that Pfizer’s side effects “could be read online,” so the source summarized this as a certain “vaccine lobby.”

**5.4.3. Healthcare industry complaints.** People’s dismay does not cease at the borders of GPs, it expands to the whole industry. In the COVID-19 context, people are crushed by prioritization. Someone claims to have lost both parents, who have succumbed to chronic illnesses that went untreated due to restrictions in hospitals, including planned surgeries and outpatient care. Others raise alarm about the inability to get treatment if unvaccinated: “A severe diagnosis has been made for a relative, needs treatment. The doctor clearly said a COVID-19 vaccination was mandatory, otherwise no treatment would be received!!!”. Another post sheds light on the chaos surrounding the disease’s tracing as a person’s father was let out of a hospital that also had a COVID-19 care unit, without testing him. When it turned out he, in fact, had COVID-19 when he departed the hospital, only his wife received a call from the authorities to inform her she was a close contact, but no questions were asked about any other close contacts, even his shared hospital ward members. Some are struggling to even get to a hospital. A Facebook user shared a story of when an ambulance is called, they look at the patient and decide hospitalization is not possible due to the “situation in the country.” Only when the patient’s condition deteriorates even more, he/she is taken straight to intensive care, with lung damage and, eventually, a lethal outcome.

Finally, COVID-19 has exposed peoples’ frustrations with the health system in Latvia in general. One view states Latvia’s healthcare priority should be well-being protection instead of dealing with the consequences: illness. When one commenter, reacting to the COVID-19 certificate requirement for various hospital treatments, suggested government should stop

collecting taxes from the unvaccinated as “all the state paid services are denied to them,” another commenter replied by questioning whether Latvia has free healthcare, stating that the country had only free emergency care. Tying health back to government distrust, some claim the Ministry of Health’s aim has never been a physically well nation, their aspiration is weak people that pharmacy could capitalize on, and the institution should be renamed to “Ministry of Sick Nation.”

Together, the criticism of doctors and healthcare structure expresses how difficult a position the doctors are in. They are painted as unqualified, bribed, insensitive, pawns in a dysfunctional system. It also shows how anti-vaccination group stories are occasionally not addressed towards vaccines, but the disappointments people have in the structure. In the short term, the government could take notes on what the nation finds as wrong and improve on it. In the longer term, once the pandemic settles, the authorities might find they are left with fractured trust in medics, too.

### **5.5. Dangers and comparison**

Some of the content on Facebook targets the highest risk groups. Whereas vaccination of the elderly and chronically ill was the priority set by the government, the code “elderly” contains highly negative attitudes from the anti-vaccination group members. Most comment that it is the government’s plan to make them die early, relieving pension and benefit payments. As one commenter puts it: “It would be wiser for older people not to get vaccinated if they want to keep a clear mind and live for longer than set by the government.” Or another one: “All the elderlies have not died yet, so the third dose must be given.” Hence, anti-vaccination content might be hitting the vaccination campaign at its pivotal points.

An unexpected finding was the importance of the code “foreign countries.” It materializes in numerous ways. Firstly, Latvians living abroad are sharing the sentiment from their place of living. Secondly, people follow foreign vaccination rates, COVID-19 cases, and deaths to look for efficacy clues. Thirdly, claims about vaccine-related deaths and complications from abroad. Fourthly, people follow along with the restrictions outside of Latvia, getting especially heated when the countries lift them, while they remain strict locally. Fifthly, excitement about protests arising in abroad against the COVID-19 restrictions and vaccination. Therefore, in the modern age, when the pandemic is being fought all over the world simultaneously, people will be keeping an eye out for the situation everywhere. The local government must be ready to explain why they are not following other countries’ lead, whether

it is being slow with lifting restrictions, no longer purchasing certain vaccines or imposing more harsh vaccine mandates in contrast to, for example, the EU peers.

## **5.6. Emotionality and atmosphere in communication**

Some of the codes we used do not carry as much content as a way of expression, or attitude. Code “doomsday” highlights how people like to use extreme negativity, zombie apocalypse comparisons, giving up freedom for bread, nation getting slaughtered. In code “history,” content draws parallels to events in the past, like the holocaust, the Nuremberg Code, how totalitarianism in Austria is reborn due to vaccine mandates, and how the Russian Revolution of 1905 should be executed again in Latvia. Posts and comments with the code “children” contain strong emotions: anger and protection. Mothers who allow their children to get the COVID-19 vaccine are often labelled as murderers. Code “disdain” accommodates diverse types of hatred towards the vaccinated and the vaccine, including ridiculing synonyms. Code “animals” talks compare the vaccinated to sheep for blindly following the mass. All these codes exemplify how widespread the emotionality of the posts is for gaining engagement.

Supplementing emotional expressions are the attempts to create a sense of unity and mobilization within the groups, captured in the code “resistance”. Some mention the groups were created for individuals who felt betrayed after vaccines have caused them pain, so they would not feel alone, could speak up and warn others. To bond, comments often end with “we will endure, shoulder to shoulder until the victory.” There is also a spectrum of encouragement to resist various COVID-19 linked measures. For example, ignore surveys about whether you would vaccinate your children, type your frustrations there, report the vaccine side-effects or reveal the names of people behind anecdotal COVID-19 deaths. Others try to inspire peers by saying it is time to “finally stand up, leave the sofa and get out in the streets”. Calls for people to gather in a crowd and enter shops maskless or go to certain organized protests are also part of this category. In other words, everyone should show their defiance at any chance.

Behind the scornful remarks in the code “uncertainty,” such as “how many COVID-19 jabs will people have to get: 1, 2, 3, 4, 5, 6, 7 or 176,” it catches some legitimate concerns of people. A few commenters protest the publication of anecdotal evidence of vaccine side-effects and death without revealing the names as it “creates 0 trust”, even towards other group members. Someone pointed out how Facebook, in a court filing, reported their “fact-check” mechanism does not claim to be the absolute truth, but rather a guarded opinion (Watts, 2021). Therefore, after the termination of the Latvian anti-vaccination group “Vakcīnrealitāte,” vaccine sceptics are even more puzzled, has it been an act of censorship. In doubt about both

media (pro-vaccine) and anti-vaccine narratives, people are left exhausted and perplexed about who can they believe. This thought is clearly captured by one comment: “I think I am losing my mind from the stream of information; I do not understand anymore, where the reality is.”

## 6. Discussion

After taking an extensive look at the Latvian anti-vaccination Facebook groups' content, it becomes more understandable why they have gained popularity- by covering a wide range of topics to different degrees of radicalism and believability. Undeniably, a substantial fraction of comments is pure hatred, a raw unleash of emotions. One will also find dozens of unbacked claims, references to questionable sources, anecdotal evidence that requires one to trust the other commenter and far-fetched theories that even some group members are not afraid to point out as questionable.

Yet, the content shared does not end at vaccines. Amidst the “noise,” it captures some legitimate concerns. For example, calls for more detailed statistics (like split by age groups of vaccinated people's COVID-19 deaths), comparison of restrictions with other, especially neighbouring, countries, absurdities in COVID-19 treatment, questioning of the effects of monetary incentives on doctors, monitoring of whether actions made by the government are backed by appropriate experts. Hence, someone might not be a vaccination sceptic *per se*, but has joined the group after finding certain restrictions too harsh and discovered like-minded individuals who wonder the same. Although a risk exists that such person might gradually get engrossed in inaccuracies shared in the group and become more vaccine hesitant, the variety of posts highlights the danger of prejudice by categorizing all members as “anti-vaxxers”.

However, considering the entire perspective, government distrust looks like the backbone of the entire discourse in the Latvian anti-vaccine Facebook groups, the one factor linking most of our developed codes together. Given disbelief in the government's good intentions to care for the nation, one leans toward the opinion media is forced to use falsified data to spread fear about the flu-like disease. In search of a rationale for government to engage in a large-scale forgery, various conspiracies sprout, including Big Pharmacy bribing, hence the pandemic must be created for elites to profit. Even the healthcare industry's representatives have a financial gain to make. As more evidence appears, one is forced to admit that COVID-19 is indeed a new illness, but what about its danger? As restrictions imposed by our local unqualified government are exaggerated, one looks at foreign examples for proof of less harsh restrictions in countries with rational leaders. When the vaccine is proposed as the solution, the

vaccine-hesitant decide this “rushed, experimental liquid” is unnecessary, even dangerous; their own immunity can overcome COVID-19 itself. Moreover, anecdotal evidence emerges of vaccine side-effects. Presented in an emotional manner, including sensitive topics such as religion, children, the elderly, and historical event comparisons, it evokes even more immense resistance that should lead to getting out on the streets so the oppressors would pay for their crimes.

Government trust is a convoluted issue that cannot be easily solved. Still, the leaders could try to tackle at least some of the criticisms raised by vaccine hesitant individuals on Facebook. For instance, the presence of the code “qualification” implies people are paying attention to the speaker’s educational and professional background. As one commenter reflects:

I never would have imagined there will be a year when politicians and people without any knowledge will be talking about diseases and medicine; I cannot understand, how in these complicated times the Health minister can be a pianist who has graduated from Jāzeps Vītols Latvian Academy of Music.

Hence, the actions implemented by politicians should be backed by experts’ assessment; cases like the cancellation of the Riga Marathon 2020, despite epidemiologists’ permission, are likely to further damage the public’s confidence (Pavlovs, 2020a).

Expertise question extends to other fields, too. People demand doctors to understand the vaccine contents. Thus, to promote confidence in sceptics, doctors ought to be able to explain the ingredients of COVID-19 vaccines, preferably to multiple levels of difficulty. Next, celebrities in COVID-19 vaccine advertisements could be expected to achieve low engagement rates among the vaccine-hesitant, likely perceived as “paid actors with an irrelevant opinion on the subject matter.”

Given the transparency of COVID-19 restrictions around the globe enabled by the internet, plenty of people are following developments outside of Latvia, as captured by our “foreign countries” code. Ideally, the state should coordinate the restrictions with other countries in the region. When unable to match the loosening of the imposed constraints by neighbours, the state officials must be ready to explain why Latvian circumstances are different. It becomes particularly relevant with COVID-19 strains like omicron, where the vaccinated are also likely to get sick, yielding the share of inoculated a weaker argument for keeping the restrictions than previously.

Finally, hesitant people yearn for a more balanced vaccine debate in the media. Suspicious of predominantly pro-vaccine “propaganda” in the media, they look for alternative views. Whether after hearing anecdotal evidence of complications after vaccination, willing to



share their concerns on how COVID-19 is treated in Latvia or how they have been forced to vaccinate, individuals want to hear a more balanced story for evaluating the risks and benefits of the vaccine. But what they find in Facebook groups is often strongly anti-vaccination, anecdotal with plenty of emotions and little proof. For example, someone posted their story:

Today there is sorrow in our office because last night our head of department died of a heart attack. Had received both [vaccine] doses. Always condemned me for unwillingness to participate in the [vaccine] experiment. Blindly believed in the government and the queen... Three more vaccinated are seriously ill and unable to work. Now the question: who is a conspiracy theory victim? Noone unvaccinated in my workplace has been sick yet, only the vaccinated.

Feeling this might be an exaggeration, one group member disapproves:

I am against mandatory inoculating, but I do not support posts like this: with kind of victims and kind of truths. If you have something to tell, do it openly, with names, surnames, and other facts, otherwise there is 0 believability in you.

This exchange highlights two things. First, the style of many experiences shared in the groups. Second, the uncertainty the reader feels about the post. The person feels exposed to vaccine-negative lies. Still, in the media, the same person might see plenty of COVID-19 vaccinated individuals getting sick and even dying of this disease, although previously proposed more than 90% efficacy against falling ill and 99% against hospitalization (Tercatin & Jaffe-Hoffman, 2021). A sense of betrayal creeps up. The individual no longer knows whom to believe and is exhausted from the seek for truth. Had the official media been more open to communicating and admitting these efficacy changes, the citizen who is in the middle of the vaccine hesitancy scale would be less encouraged to look for information in Facebook groups that tilt them to the anti-vaccine side. Yet, not sophisticated enough to read and analyse scientific research in English by themselves, they rely on their emotion-driven peers for information.

## 7. Conclusions

In this paper, we analyse the peer-to-peer communication within the Latvian anti-vaccine movement in the context of COVID-19 vaccines. Using qualitative analysis of data collected from public groups of the most popular user-generated content platform Facebook, we identify and discuss the main narratives, values, and beliefs holding together the online anti-vaccine movement in Latvia in the context of existing frameworks.

We find that, from the 5C's of the vaccine hesitancy framework, confidence plays the primary role in the Latvian anti-vaccine narrative as it implies the distrust in the purity of the

government's care for the people. Complacency is left perceived as secondary, and calculation is severely skewed because of the popularity of unreliable news and data sources. Meanwhile, convenience and collective responsibility are largely ignored in this context.

Latvian anti-vaccine movement covers most of the central COVID-19 conspiracies and misinformation plots, consistent with several existing research papers on distrust in authority motives and “alliance” of the establishment liable for the current situation. However, we identify several narratives seemingly unique to the Latvian case: prominent criticism of healthcare practitioners and the healthcare system in general, perceived as unqualified, bribed, and immoral, in addition to alleged COVID-19 case falsification to receive more EU funding.

Our findings could help authorities and news outlets to address the persisting COVID-19 vaccine hesitancy in Latvia because it provides a deep local context to the issue. From increasing qualification standards of ministers to backing political actions with expert assessments to increasing health practitioner knowledge of vaccine ingredients, the qualification aspect stands out as a clear area to improve. Transparency of and justification for the situation abroad must also be considered as vaccine sceptics are closely following the political decisions and developments outside of Latvia. Finally, a more balanced vaccine debate in the media is required to avoid scaring off sceptics who believe mass media only spread pro-vaccine “propaganda” because of no alternating views expressed.

To advance on this research topic in Latvia, it would be valuable to analyse larger datasets, especially, data from other less-regulated platforms with active anti-vaccine debate, like Telegram. Furthermore, these findings could be analysed in relation to the Latvian government's pro-vaccine media campaigns and even separate political decisions to understand their shortcomings and learn from mistakes made.

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## 9. Appendices

### Appendix A. Codebook and code description.

<b>Code</b>	<b>Description</b>
<i>Death</i>	Reference to death, dying or murder in any context
<i>Conspiracies</i>	Elaborate explanations for or motivations behind events or political decisions
<i>Government</i>	References to local and foreign governments, political leaders' names, government's authority, and ways it is exerting its power
<i>Children</i>	Mention of children and youth
<i>Criminal</i>	Comparison or reference of any criminal act to vaccination against COVID-19, mention of court, litigation or other courtroom-related topics, lack of or a future responsibility in a lawful sense for the effects of COVID-19 vaccines
<i>Resistance</i>	Either actions of self-resistance against certain rules and political power or invitations for the rest of the group members to resist power, calls for action
<i>Foreign countries</i>	Reference to a country that is not Latvia in any context
<i>Disdain</i>	Ridiculing of the vaccine to undermine trust in its efficacy, also the vaccinated and their apathy in fighting for their rights
<i>Immunity</i>	Reference to human body's immune processes and their changes both before and after the COVID-19 vaccine, including references to other illnesses
<i>Media</i>	Reference to any source of public media or source of information that is not private in any context
<i>Anecdotes</i>	Stories of personal or family experience, or an experience of an acquaintance whose relationship with the text author is often untraceable and vague
<i>Healthcare</i>	Reference to healthcare professionals as well as to remedies against COVID-19 vaccine side-effects
<i>Uncertainty</i>	Expression of ambiguity about future
<i>Economic gains</i>	Any connection to one or several entities gaining financial benefit from vaccines or COVID-19 in general
<i>Side-effects</i>	Connection of any side-effects or illnesses to the COVID-19 vaccine
<i>Experiment</i>	Calling the vaccine an experiment and highlighting its novelty and uncertainty connected with it
<i>Data misrepresentation</i>	Reference to any data or its unavailability and misrepresentation as well as mention of any data sources
<i>Denial</i>	Questioning or denying the importance of COVID-19 virus among and compared to other illnesses or by itself, expression of COVID-19 virus being fake, disbelief in COVID-19 vaccine efficiency
<i>Elderly</i>	Mention of people over 60 years old or parents, grandparents
<i>Opposition</i>	Doubts and objections towards anti-vaccine opinions
<i>Qualification</i>	Reference to a person's qualification level or education in any context, including incompetence to speak about medicine-related topics
<i>History</i>	Reference to any historical event, year, symbol, or definition, drawing connections from historical events
<i>News</i>	Republications or often directly translated news articles from other languages (included due to frequency of such news articles that are often not connected to the local events or on-going discussions)
<i>Animals</i>	Usage of the name of any animal
<i>Religion</i>	Reference to any religious symbol, act, or belief in any context
<i>Doomsday</i>	Reference to a future point in time that will bring horror to all humanity
<i>Restrictions</i>	Reference to government-imposed restrictions

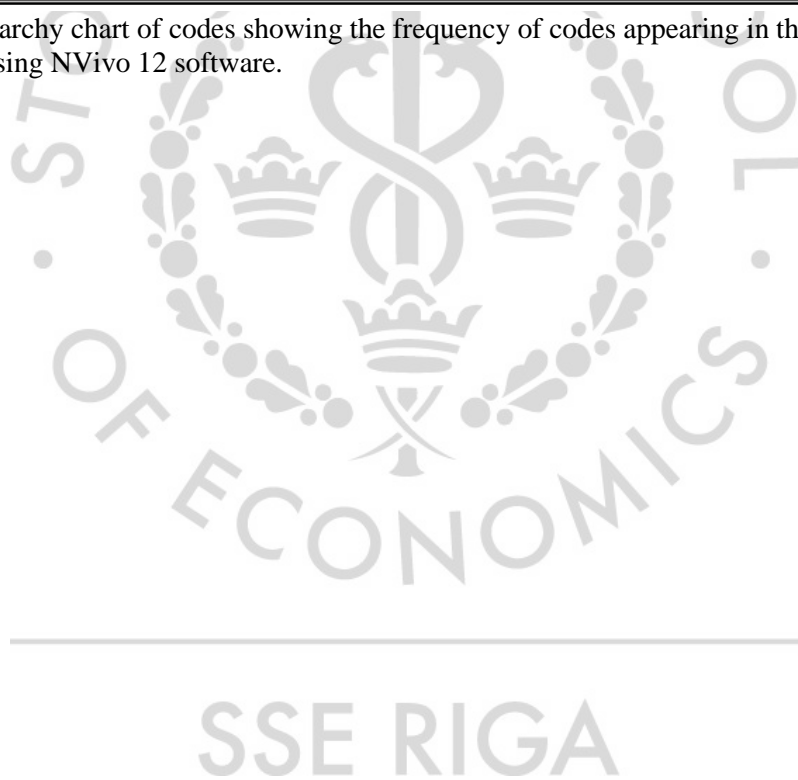
Table A.1. The codebook developed by the authors used in the manual coding of dataset. Table contains the 27 codes and concise description for each code. Made by the authors in the data analysis process.



**Appendix B. Hierarchy chart of codes.**

Death	Children	Foreign countries	Anecdotes	Healthcare	Uncertainty	Economic g...
Conspiracies	Criminal	Side-effects	Immunity	Denial	Elderly	Opposition
		Disdain				
Government	Resistance	Media	Experiment	Qualification	News	
			Data misrepresentation		History	Religion
						Animals

Figure B.1. Hierarchy chart of codes showing the frequency of codes appearing in the analysis. Made by the authors using NVivo 12 software.



## Appendix C. Node matrix.

	Anecdotes	Animals	Children	Conspiracies	Criminal	Data misrepresentation	Death	Denial	Disdain	Doomsday	Economic gains	Elderly	Experiment	Foreign countries	Government	Healthcare	History	Immunity	Media	News	Opposition	Qualification	Religion	Resistance	Restrictions	Side-effects	
Animals	0																										
Children	5	4																									
Conspiracies	12	3	11																								
Criminal	5	2	9	7																							
Data misrepresentation	2	0	1	14	0																						
Death	<b>20</b>	3	<b>21</b>	<b>22</b>	12	<b>18</b>																					
Denial	1	0	2	4	3	1	8																				
Disdain	2	1	11	13	1	2	12	6																			
Doomsday	0	0	0	2	0	0	6	0	2																		
Economic gains	4	1	3	14	6	1	11	3	3	2																	
Elderly	8	0	7	1	1	2	18	0	4	0	5																
Experiment	2	1	9	7	5	0	9	4	7	0	5	1															
Foreign countries	1	1	4	15	10	6	19	4	3	2	5	1	2														
Government	3	1	6	14	18	3	19	2	6	2	<b>20</b>	3	3	11													
Healthcare	5	0	3	11	4	1	5	1	1	1	18	6	4	4	11												
History	0	1	1	6	3	2	5	2	1	0	1	0	0	9	2	1											
Immunity	2	3	3	16	2	1	4	2	2	0	2	2	3	4	3	5	1										
Media	3	0	5	6	4	8	13	3	5	0	4	1	3	9	8	2	0	4									
News	0	1	5	2	3	0	3	1	0	0	0	0	1	13	0	0	0	4	0								
Opposition	0	1	0	3	1	0	2	1	0	0	0	1	0	0	0	0	0	0	0	0	0						
Qualification	0	1	0	2	1	1	2	3	0	0	3	0	1	1	7	4	0	0	0	0	0	0					
Religion	2	0	2	3	0	0	2	0	0	0	1	0	0	0	1	1	1	1	1	1	0	1	0				
Resistance	5	0	11	12	12	5	8	2	2	1	1	0	4	10	12	3	2	1	14	1	1	1	3				
Restrictions	0	0	0	3	1	0	0	0	0	0	0	0	0	3	1	0	0	0	1	0	2	0	1	9			
Side-effects	<b>36</b>	2	9	<b>22</b>	9	8	9	1	4	0	4	1	5	15	5	8	1	14	7	4	1	0	0	6	0		
Uncertainty	1	1	4	7	3	0	9	3	4	1	1	0	4	5	3	4	0	3	2	0	1	2	0	2	0	5	

Table C.1. Node matrix with conditional formatting with higher scores colored greener, and scores above 20 are highlighted in bold. Made by authors using data from NVivo 12 software.



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## Appendix D. Horizontal dendrogram of codes.

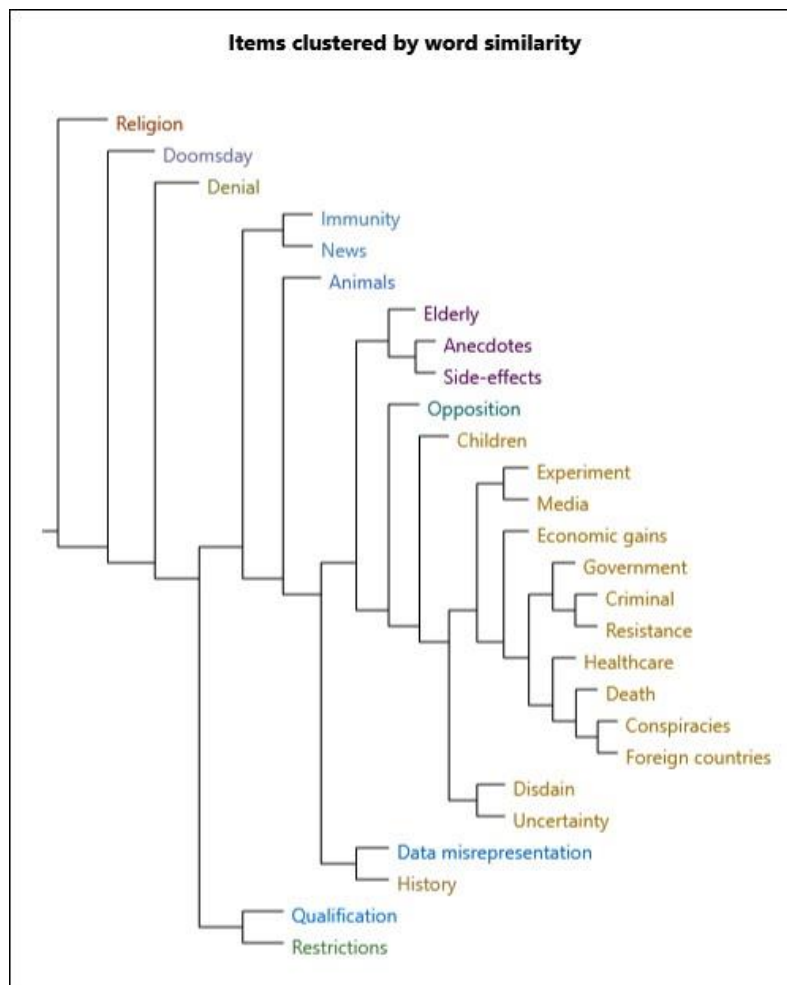


Figure D.1. Horizontal dendrogram of the cluster analysis of the codes using Pearson's coefficient, structuring code relationships by the similarity of words within codes. Made by the authors using NVivo 12 software.

## Appendix E. Crosstab across groups.

Nodes	Group = CVU	Group = PPV	Total
Anecdotes	89	6	95
Animals	17	10	27
Children	92	42	134
Conspiracies	171	23	194
Criminal	99	31	130
Data misrepresentation	52	9	61
Death	147	51	198
Denial	37	18	55
Disdain	83	23	106
Doomsday	10	6	16
Economic gains	50	30	80
Elderly	26	21	47
Experiment	49	15	64
Foreign countries	97	30	127
Government	83	86	169
Healthcare	75	16	91
History	26	10	36
Immunity	52	23	75
Media	83	20	103
News	18	12	30
Opposition	45	0	45
Qualification	23	14	37
Religion	20	7	27
Resistance	100	28	128
Restrictions	13	2	15
Side-effects	109	6	115
Uncertainty	67	17	84
<b>Total</b>	<b>1733</b>	<b>556</b>	<b>2289</b>

Figure E.1. Crosstab of the codes divided by each of the groups used in our analysis. Conditional formatting used with higher scores coloured green. Made by authors using data from NVivo 12 software.

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## Appendix F. Code frequency across time.

	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
<b>Death</b>	9,1%	6,7%	9,7%	11,2%	12,8%	9,4%	8,3%	7,2%	9,5%	<b>8,9%</b>
<b>Conspiracies</b>	10,9%	9,7%	9,7%	2,4%	8,3%	3,7%	6,5%	11,6%	9,8%	<b>8,6%</b>
<b>Government</b>	5,3%	4,7%	6,8%	9,8%	12,0%	15,9%	7,7%	5,5%	8,1%	<b>7,5%</b>
<b>Children</b>	3,2%	4,7%	10,7%	7,3%	7,5%	5,6%	3,6%	8,4%	4,0%	<b>5,8%</b>
<b>Foreign countries</b>	2,8%	5,3%	3,9%	4,9%	3,0%	6,5%	10,1%	9,3%	4,3%	<b>5,6%</b>
<b>Resistance</b>	8,8%	6,4%	2,9%	5,9%	6,0%	4,7%	3,0%	4,1%	5,5%	<b>5,6%</b>
<b>Criminal</b>	7,0%	6,1%	8,7%	5,2%	3,0%	9,4%	4,1%	4,9%	4,0%	<b>5,5%</b>
<b>Side-effects</b>	0,4%	7,8%	5,8%	1,7%	6,8%	1,9%	7,1%	8,1%	6,0%	<b>5,2%</b>
<b>Disdain</b>	2,8%	1,4%	0,0%	3,8%	4,5%	8,4%	8,3%	4,9%	6,6%	<b>4,4%</b>
<b>Media</b>	8,4%	4,4%	3,9%	4,9%	1,5%	3,7%	3,0%	3,2%	3,7%	<b>4,4%</b>
<b>Anecdotes</b>	3,2%	5,5%	1,9%	2,4%	3,0%	0,9%	5,3%	4,6%	6,3%	<b>4,2%</b>
<b>Healthcare</b>	5,6%	6,9%	3,9%	2,4%	0,8%	3,7%	5,3%	1,5%	4,3%	<b>4,0%</b>
<b>Uncertainty</b>	2,8%	2,5%	2,9%	1,4%	6,0%	3,7%	5,3%	5,2%	4,6%	<b>3,7%</b>
<b>Economic gains</b>	2,1%	2,2%	5,8%	5,6%	2,3%	5,6%	3,6%	1,5%	4,6%	<b>3,4%</b>
<b>Immunity</b>	3,5%	5,5%	1,9%	3,1%	3,0%	1,9%	3,0%	2,0%	3,5%	<b>3,3%</b>
<b>Data misrepresentation</b>	4,9%	2,2%	7,8%	1,7%	1,5%	2,8%	1,8%	2,0%	2,6%	<b>2,8%</b>
<b>Experiment</b>	1,8%	2,5%	4,9%	3,1%	4,5%	0,9%	1,8%	3,5%	2,3%	<b>2,7%</b>
<b>Denial</b>	1,1%	2,2%	0,0%	3,1%	3,8%	0,9%	4,1%	2,0%	3,5%	<b>2,4%</b>
<b>Opposition</b>	7,0%	2,8%	0,0%	0,7%	0,0%	0,0%	0,0%	1,5%	1,7%	<b>2,0%</b>
<b>Elderly</b>	1,1%	1,1%	1,9%	6,3%	1,5%	0,0%	1,2%	3,5%	0,0%	<b>2,0%</b>
<b>History</b>	1,4%	2,2%	0,0%	2,4%	1,5%	0,9%	1,8%	1,7%	0,9%	<b>1,6%</b>
<b>Qualification</b>	1,8%	1,1%	3,9%	3,1%	2,3%	0,9%	0,6%	0,6%	1,2%	<b>1,5%</b>
<b>News</b>	0,4%	1,9%	1,0%	1,1%	0,8%	0,9%	1,2%	1,2%	1,7%	<b>1,2%</b>
<b>Religion</b>	1,8%	2,2%	1,0%	2,1%	0,0%	0,9%	0,6%	0,6%	0,6%	<b>1,2%</b>
<b>Animals</b>	1,1%	0,6%	1,0%	2,1%	2,3%	2,8%	0,6%	0,9%	0,9%	<b>1,2%</b>
<b>Restrictions</b>	0,7%	1,1%	0,0%	1,1%	0,8%	1,9%	0,0%	0,9%	0,0%	<b>0,7%</b>
<b>Doomsday</b>	1,4%	0,3%	0,0%	1,1%	0,8%	1,9%	2,4%	0,0%	0,0%	<b>0,7%</b>
<b>Total</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

Table F.1. Code frequency by months of 2021. Made by authors using data from NVivo 12 software.

## Appendix G. An example of a Facebook post

Dmitry Polushin, a journalist whose mother died from a vaccine, wrote: “If you were vaccinated, then:

- 1) If there are any complications, it is you yourself who is so sick, not at all the vaccine that worked that way;
- 2) If you get sick with COVID-19 a few days later, then it was on the way to the vaccination and definitely not because of the vaccine itself;
- 3) If you get sick after a few weeks, then this is because the immune system has not yet worked;
- 4) If you get sick after 3-4 months, then this is because the level of antibodies has already decreased;
- 5) If you get sick between points 3 and 4, then “you were warned that not everyone produces antibodies”;
- 6) If you get sick in a mild form, then it was the vaccine that saved you, and not your immunity;
- 7) If they were injected and became seriously ill, then without vaccination they would have died, or at least they would have been on a ventilator;
- 8) If you ended up on a ventilator or in a cemetery after a vaccine, then this is not from the vaccine for sure, but because there were many other diseases, and age in general (without specifying what exactly is wrong with age [as to why it makes you more vulnerable to COVID-19]).

But then:

- 9) If you didn't get vaccinated and didn't get sick, then you are lucky. You will still get sick, and immediately on a ventilator;
- 10) If you are not vaccinated and get sick, then it is your own fault, because the government takes care of you (as always);
- 11) If you died six months after you had had COVID-19, even if in a mild form, then that is strictly from the consequences of COVID-19. Not to be confused with the situation when someone was ill [with COVID-19], vaccinated and died. Because “you do not understand, that is completely different”.

And the most interestingly:

- 12) If you had been ill and now have antibodies, nobody cares. These are not THOSE [vaccine] antibodies and there are already too few of them for the new strain;
- 13) The antibodies of those who have been ill are of poor quality, they are of high quality only from the vaccination.

Figure G.1. An example of a post on a Latvian anti-vaccine Facebook group, translated from Russian.

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