

## Attitudes and Opinions of Veterinary Professionals About Covid-19 Infection and Vaccination Against It

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**Abstract.** Veterinarians are well trained to recognize and control infectious diseases and use vaccination as a routine procedure for preventing infectious diseases in animals. This role of veterinarians has become more emphasized since acceptance of concept “One world – one health” by health professions in medical and veterinary fields. It would be expected that veterinarians are well-prepared to form a scientifically based opinion on Covid-19 and on value of vaccination against it at individual and society level. The goal of this study was to determine whether and to what extent veterinary medical knowledge and experience influences beliefs, attitudes and actions towards Covid-19 and vaccination at individual and society levels. To address this goal, structured, anonymous interviews were conducted in March 2022 with volunteers representing veterinary professionals ( $n = 14$ ). Results showed that veterinary professionals represented a divided community of people. While majority (almost 80%) of veterinary professionals voluntarily chose to be vaccinated and believed that Covid-19 is dangerous to their health and society as a whole, there were 2 respondents that believed in conspiracy theories, 2 that did not think that Covid-19 was substantial threat to them or society, and 3 that refused or were reluctant to get vaccinated. There was a direct correlation between believing in conspiracy theories and vaccine-hesitancy. Personal experience having severe illness caused by Covid-19 did not change beliefs. There was no direct correlation between support for animal vaccinations and support for vaccination against Covid-19. Overall, these results show that veterinary professionals in Latvia are not particularly different from Latvian society in general. Presence of supporters of conspiracy theories and vaccine-sceptics among veterinarians indicate that there are factors besides professional public health training and education (university degree and even PhD) that influence establishment of personal beliefs and attitudes.

**Keywords:** conspiracy theories, Covid-19, one-health, vaccine hesitancy, vaccination, veterinarians

## Introduction

Educational process for veterinary professionals provides a solid theoretical background about infectious diseases and their control within animal populations. As part of the professional training, strong emphasis is placed on recognition and prevention of diseases that people can contract from animals or their products (zoonoses). In the last decade, this emphasis has become even more highlighted, since health professions from medical and veterinary fields have embraced the concept of “One world – one health” (often referred to simply as “One Health”) (Iatridou *et al.* 2021). According to this concept, in the world that we live in, there is no strict division between human and animal health, therefore, to achieve health in human population, we also must aim for optimal health and balance in the environment that surrounds people and includes animals and plants.<sup>1</sup>

It is expected that, based on their training and professional experience in the control of infectious diseases and use of vaccination as a routine procedure for prevention of infectious diseases, veterinarians would be well-prepared to form a scientifically based opinion on the infection caused by SARS-CoV-2 virus (coronavirus disease, Covid-19). Furthermore, it would be expected that veterinarians would be proponents of vaccination against Covid-19 because they would understand the importance of vaccination in providing protection at individual and more importantly, society level. On the other hand, veterinary professionals may represent a diverse group of specialists with various experiences and opinions, and their attitude may not be as uniform as expected. Such diversity was seen in Latvian medical society with incidental reports of some doctors not advising their patients to be vaccinated and some nurses even participating in schemes of providing fake vaccination certificates (Feldmanis, Kozins 2021; Krenberga 2021). The goal of this study was to determine whether and to what extent veterinary medical knowledge and experience influences beliefs, attitudes and actions towards Covid-19 and vaccination at individual and society levels. Indirectly we wanted to identify arguments that have (or have not) convinced veterinary professionals about seriousness of Covid-19. With these goals in mind, we conducted interviews with volunteers who agreed to participate in the study.

## Methodology

Structured interviews were conducted in *Zoom* platform at the beginning of March 2022 by a professional sociologist also trained in psychology. Interviews consisted of 7 questions with estimated interview time of 10 minutes. Following questions were asked:

Question No. 1 (Q1): How, in your opinion, did Covid-19 emerge?

Question No. 2 (Q2): In your opinion, is vaccination of animals useful? Why yes or why not?

Question No. 3 (Q3): In your opinion, is vaccination of people against Covid-19 useful? Why yes or why not?

Question No. 4 (Q4): In your opinion, is Covid-19 dangerous to you personally? Why yes or why not?

Question No. 5 (Q5): In your opinion, is Covid-19 dangerous to society? Why yes or why not?

Question No. 6 (Q6): Have you been sick with Covid-19? When and how severely, in your estimate?

Question No. 7 (Q7): Are you vaccinated against Covid-19? When?

Interviews also included personal questions about age, professional education, type of work and work experience. Interviews were anonymous and the interviewer was a person unknown to study participants. Study participants were volunteers that agreed to be interviewed. Invitation to participate in the study was sent out by e-mail to Latvian veterinarians from several sources: Latvian Veterinary Association (includes more than 800 members), Faculty of Veterinary Medicine (includes teaching staff and students, more than 250 people; some overlap with Latvian Veterinary Association members). Invitation to study was also promoted on social networks used by Latvian veterinary professionals, such as *Facebook* page *vetiem.lv* and small animal practitioner site. Interviews were recorded, transcribed, and given to the researcher (IMV) for analysis as an Excel file. For quantitative analysis, the responses were categorized as ‘agree’, ‘mostly agree’, ‘mostly disagree’ and ‘disagree.’

## Results

Fourteen veterinarians had volunteered to participate in the interviews. All participants were women, median age bracket was 31–40 years old (range 20–30 to 61–70). Among participants there was one student. All the others had the 2<sup>nd</sup> level professional degree (six years of university studies with degree of veterinary doctor) and among them 3 were professionals with PhD degree (Dr. med. vet.) and 2 were enrolled in PhD studies. Majority of the participants ( $n = 6$ ) had more than 20 years of experience in the field (range <1 to >20 years). Participants were employed in a broad array of jobs in veterinary profession including veterinary assistant ( $n = 1$ ), practitioner ( $n = 3$ ), practitioner/teaching staff/professor ( $n = 3$ ), consultant in a veterinary wholesale company ( $n = 2$ ), and specialist in a veterinary laboratory ( $n = 2$ ). Three participants were not on active duty (retired or on temporary leave).

Answers to Q1 (“How, in your opinion, did Covid-19 emerge?”) were quite varied. In general, most veterinary professionals admitted that it was not known

for sure how SARS-CoV-2 emerged and ten of them mentioned that they believed it was a viral mutation associated with increased virulence and/or likely jump of the virus from an animal species (possibly bats) to humans. Several of these 10 veterinarians discussed some other possibilities along with these, including two that mentioned a possibility of the virus being released (accidentally or not) from a laboratory. These opinions are along the lines of the current state of scientific knowledge published in peer reviewed publications (Keni *et al.* 2020; Muralidar *et al.* 2020; Worobey *et al.* 2020). One veterinarian said that it was “a virus from China” without further elaboration. Another veterinarian discussed possibility of a viral transmission from animals to humans as equally possible as the virus being artificially produced.

Respondent Nr. 10 (R10): *“It is such a question that one can only guess. I do not rule out that it [the virus] is artificially formed. I am not convinced, but I don’t rule it out either. Well, if it is natural, then it has already been stated many times that [it jumped] from species to species overcoming species barriers. But in this case, I really do not rule out that the whole event was artificially created”.*

Two veterinarians strongly favoured conspiracy theories that included specially designed campaign that would benefit those involved in vaccine production or sales of medical supplies.

Respondent Nr. 5 (R5): *“Well, I mean...it might not be popular, but I don’t believe it is from one mouse that was eaten by a Chinese and taken around the world. I think it’s some kind of specially organized event for people to profit from selling masks, gloves, vaccines, etc. I don’t believe that such a strong potential for that virus [exists to spread] from one mouse all over the world”.*

Respondent Nr. 14 (R14): *“I think that it is man-made, because the place of origin... Because it was known for a very long time that such studies were taking place. Maybe they didn’t have such a goal as it turned out now, maybe not at all... The fact is that it all started when the big fights about vaccines started... Nowadays you can find a lot, everything that is written cannot be believed. You have to search for yourself”.*

Answers to Q2 and Q3 were coded and analysed in relation to each other to determine if there was correlation between personal beliefs about usefulness of vaccination for prevention of diseases in animals and usefulness of vaccination against Covid-19 (Table 1). All veterinarians agreed or mostly agreed that vaccination of animals was useful; however, the attitude towards vaccination of people against Covid-19 was less uniform. Two respondents who did not think

that vaccination against Covid-19 was useful were the same two respondents who favoured conspiracy theories in Q1 (R5 and R14). Interestingly, one of them was a strong proponent of animal vaccination but opposed vaccination against Covid-19 because of not seeing the benefit of the latter. This respondent commented that vaccination against Covid-19 possibly decreased severity of illness with delta strain of SARS-CoV-2; however, that was not sufficient evidence to change her mind about usefulness of Covid-19 vaccines. The other respondent who did not support vaccination against Covid-19 discussed at length the lack of specificity of vaccines – that they did not protect against infection with Covid-19 but, instead, “mess up immune system” and therefore vaccinated people got sick more often. At the end, she believes, everything is politics.

Table 1. Personal attitude of veterinary professionals towards vaccinations

Vaccination of animals is useful	Vaccination of humans against Covid-19 is useful			
	Agree N (%)	Mostly agree N (%)	Disagree N (%)	Total N (%)
Strongly agree	9 (64%)	2 (14%)	1 (7%)	12 (86%)
Mostly agree	0	1 (7%)	1 (7%)	2 (14%)
Total	9 (64%)	3 (21%)	2 (14%)	14 (100%)

Answers to Q4 and Q5 were coded and analysed in correlation with each other to determine if the perceived individual threat presented by Covid-19 and its perceived threat at the society level were correlated (Table 2). Results showed that the majority of the respondents (11/14; 79%) perceived Covid-19 as a threat to their own health and even more (12/14; 86%) perceived it as a threat to the society. Of 3 respondents who expressed a low perceived individual threat level presented by Covid-19, two did not think that Covid-19 was dangerous to the society. These were the same two respondents (R5, R14) that expressed Covid-19 vaccine scepticism and inclination for conspiracy theories. Arguments that were mentioned in substantiating these opinions included statements that Covid-19 was similar in its severity to flu and pointing out that research should be more focused on the factors that would explain why some people did not contract Covid-19. These results indicate that the perceived individual threat level is directly correlated with the perceived threat at the level of society.

Table 2. Personal opinion of veterinary professionals about the threat of Covid-19 at personal and society level

Covid-19 is dangerous to me personally	Covid-19 is dangerous to the society			
	Agree N (%)	Mostly agree N (%)	Disagree N (%)	Total N (%)
Agree	6 (43%)	1 (7%)	0	7 (50%)
Mostly agree	3 (21%)	1 (7%)	0	4 (29%)
Mostly disagree	0	1 (7%)	1 (7%)	2 (14%)
Disagree	0	0	1 (7%)	1 (7%)
Total	9 (64%)	3 (21%)	2 (14%)	14 (100%)

The last two questions (Q6 and Q7) were about personal actions (getting vaccinated against Covid-19 and when) and experience with Covid-19 infection (Table 3). The goal was to see if personal experience may influence answers to the questions 1–5.

Table 3. Covid-19 infection in veterinary professionals depending on their vaccination status

I am vaccinated against Covid-19	I have been sick with Covid-19		
	Yes N (%)	No N (%)	Total N (%)
Yes, according to my own will	5 (36%)	6 (43%)	11 (79%)
Yes, after it was mandatory	2 (14%)	0	2 (14%)
No	1 (7%)	0	1 (7%)
Total	8 (57%)	6 (43%)	14 (100%)

Most of the respondents (8/14; 57%) experienced Covid-19 disease as it would be expected in the early spring of 2022 after almost two years of Covid-19 pandemic in Latvia including widespread infections with omicron variant of Covid-19 in January and February of 2022. Almost 80% (11/14) of veterinarians chose to be vaccinated voluntarily against Covid-19 soon after it was available. This was a higher proportion than in general public where this level of vaccination was attained in early 2022, only after mandatory Covid-19 vaccination was instituted for large proportion of work force (teachers, medical workers and government employees) (Valsts kanceleja 2022). Only those respondents who were vaccinated and had done so on their own and as early as possible appeared to be able to avoid disease; however, the number of participants in other categories was too small to draw conclusions about correlation between vaccination status, time of vaccination, and the disease. There were several interesting

observations that were not impacted by the limited number of participants. This study revealed that veterinarians were not 'immune' to vaccine-hesitancy and that some of these professionals get vaccinated only after being compelled to do so. Two veterinarians that got vaccinated only after it became a mandatory requirement were R5 and R14, who had scepticism towards Covid-19 vaccines and did not think that Covid-19 was a significant threat to their health or society. The only veterinarian that did not get vaccinated against Covid-19 was a retired veterinarian (age group 61–70) with PhD and previous jobs at the Faculty of Veterinary Medicine and State Veterinary Department. Although she recognized importance of public to be vaccinated because it decreased the number of lost lives, and while she experienced quite severe Covid-19 illness herself, she still was more inclined to avoid vaccination for herself because of concerns for 'over-stimulating' immune system. Overall, it appeared that respondents who were ill with Covid-19, used this experience to substantiate the beliefs they already had.

It is important to mention some of the comments voiced by respondents who were Covid-19 vaccine sceptics. In general, it was quite clear that these respondents were aware of their opinion not being aligned with 'mainstream or correct' opinion. Furthermore, it was apparent that they had felt marginalized but this experience did not change their views and opinions. Another comment was made about mandatory vaccination being a bad policy decision that actually did more harm than good in the eyes of those who were vaccine-hesitant.

## Conclusions

Veterinary professionals represent a divided, possibly polarized community of people. While the majority (almost 80%) of veterinary professionals voluntarily chose to be vaccinated and believed that Covid-19 represented a danger to their health and society as a whole, there were a few (2–3) respondents who believed in conspiracy theories, did not think that Covid-19 was a substantial threat to themselves or society, and refused or were reluctant to get vaccinated.

Overall, 80% of veterinary professionals elected to get vaccinated as early as possible in 2021. This proportion is higher than in general public, indicating that most veterinary professionals can be relied upon and used as a supportive community in case of another emerging disease that requires control measures similar to Covid-19.

There was a direct correlation between believing in conspiracy theories and vaccine-hesitancy. Personal experience of having a severe illness caused by Covid-19 did not change these beliefs. There was no direct correlation between support for animal vaccinations and support for vaccination against Covid-19. Vaccine sceptics were aware of their views being different from the 'official

opinion'. Criticism that they may have received did not change their attitudes towards Covid-19.

Overall, these results show that veterinary professionals in Latvia are not particularly different from Latvian society in general (Spundiņa 2021). Presence of supporters of conspiracy theories and vaccine-sceptics among veterinarians indicate that there are factors besides professional public health training and education (university degree and even PhD) that influence establishment of personal beliefs and attitudes. We conclude that professional training and university education do not automatically instil critical thinking skills, nor do they grant the ability to navigate successfully within the abundance of information available in current times.

**Author's note.** This research was funded by the Latvian Council of Science, the project "Jeopardizing Democracy through Disinformation and Conspiracies: Reconsidering Experience of Latvia", No. lzp-2019/1-0278.

## ENDNOTES

- 1 CDC (USA Center for Disease Control) definition of One Health: "One Health is a collaborative, multisectoral, and transdisciplinary approach – working at the local, regional, national, and global levels – with the goal of achieving optimal health outcomes recognizing the interconnection between people, animals, plants, and their shared environment."

## REFERENCES

- Feldmanis, K. & Kozins, I. (2021). Par vakcinācijas pret Covid-19 imitāciju un kukuļa došanu ārstam aiztur septiņas personas [Seven people are arrested for imitating the vaccination against Covid-19 and giving a bribe to a doctor]. *LSM.lv*, 13 Aug. Retrieved from: <https://www.lsm.lv/raksts/zinas/latvija/par-vakcinacijas-pret-covid-19-imitaciju-un-kukula-dosanu-arstam-aiztur-septinas-personas.a416809/>
- Iatridou, D., Bravo del Moral, A., Saunders, J. (2021). One Health Interdisciplinary Collaboration in Veterinary Education Establishments in Europe: Mapping Implementation and Reflecting on Promotion. *Journal of Veterinary Medical Education*, 48, e20200019. DOI: <https://doi.org/10.3138/jvmeD-2020-0019>
- Keni, R., Alexander, A., Nayak, P. G., Mudgal, J., Nandakumar, K. (2020). COVID-19: Emergence, Spread, Possible Treatments, and Global Burden. *Frontiers in Public Health*, 28 May. DOI: <https://doi.org/10.3389/fpubh.2020.00216>
- Krenberga, O. (2021). Stradiņa slimnīcas mediķe: Ja ārsts grūtniecei iesaka nepotēties pret Covid-19, tad jāiet pie cita [Doctor of Stradiņš Hospital: If the doctor advises a pregnant woman not to get vaccinated against Covid-19, then she should go to another doctor]. *LSM.lv*, 5 Nov. Retrieved from: <https://www.lsm.lv/raksts/zinas/latvija/stradina-slimnिकास-medike-ja-arsts-grutniecei-iesaka-nepoteties-pret-covid-19-tad-jaiet-pie-cita.a429013/>



Muralidar, S., Ambi, S. V., Sekaran, S., Krishnan, U. M. (2020). The Emergence of COVID-19 as a Global Pandemic: Understanding the Epidemiology, Immune Response and Potential Therapeutic Targets of SARS-CoV-2. *Biochimie*, 179, 85–100. DOI: <https://doi.org/10.1016/j.biochi.2020.09.018>

Spundiņa, I. (2021). Aptauija: Lielākie vakcinācijas pret Covid-19 pretinieki ir cilvēki ar pamatizglītību un zemiem ienākumiem [Survey: The strongest opponents of vaccination against Covid-19 are people with basic education and low income]. *LSM.lv*, 5 Sept. Retrieved from: <https://www.lsm.lv/raksts/zinas/latvija/aptauja-lielakie-vakcinacijas-pret-covid-19-pretinieki-ir-cilveki-ar-pamatizglitiba-un-zemiem-ienakumiem.a419941/>

Valsts kanceleja (2022). *Latvijas iedzīvotāju vecumā 12+ primārās vakcinācijas aptvere sasniegusi 80%* [Primary vaccination coverage of Latvian population aged 12+ has reached 80%]. *Latvijas Valsts kancelejas Covid-19 informatīvā mājaslapa* [The Latvian State Chancellery's Covid-19 information website], 2 Febr. Retrieved from: <https://covid19.gov.lv/aktualites/latvijas-iedzivotaju-vecuma-12-primaras-vakcinacijas-aptvere-sasniegusi-80>

Worobey, M., Pekar, J., Larsen, B. B., Nelson, M. I., Hill, V., Joy, J. B., Rambaut, A., Suchard, M. A., Wertheim, J. O., Lemey, P. (2020). The Emergence of Sars-cov-2 in Europe and North America. *Science*, 370(6516), 564–570. DOI: <https://doi.org/10.1126/science.abc8169>