

# COVID-19 Vaccine Acceptance and Hesitancy among Veterinarians in Brazil

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## ABSTRACT

**Background:** acceptance of the covid-19 vaccination is a key point to fight against the actual pandemic. The rapid development of covid-19 vaccines caused worldwide concerns about its efficacy, side-effects and uncertainty in the future after immunization, thus contributing to vaccine acceptability and hesitancy. Historically, vaccine hesitancy by part of the populations constitutes a barrier to achieve control of preventable infectious diseases. The objective of this study was to assess the acceptance and hesitancy rates to the covid-19 vaccination among Brazilian veterinarians by the beginning of the national vaccination campaign.

**Methodology:** a voluntary anonymous online survey conducted from November 10, 2020 to March 31, 2021, accessing a closed group of vets from the network Facebook.

**Results:** our results showed that from the sample of 351 respondents, 239 (68.09%), 81 (23.08%), and 31 (8.83%), declared themselves in favor, not now, and against vaccination, respectively, given about two-thirds acceptance and one-third vaccine hesitancy.

**Conclusion:** this study demonstrated a positive but moderate level of acceptance of the covid-19 vaccination by part of Brazilian veterinarians.

**Key Words:** Covid-19, Covid-19 vaccine, Vaccine hesitancy, Vaccine acceptance, Vaccine resistance, Veterinarians

## INTRODUCTION

In December 2019, in a cluster of Chinese patients with pneumonia was identified a severe acute respiratory syndrome caused by a novel beta coronavirus called 2019-nCoV, the seventh member of the family of coronaviruses that infect humans<sup>1</sup>. This syndrome known also to as Covid-19 disease was linked to a seafood wholesale market in the city of Wuhan, China. It had spread rapidly and on March 11, 2020, World Health Organization declared the Covid-19 outbreak a global pandemic<sup>2</sup>. In late 2021, the total confirmed

cases on the globe reached 283 million, with 5.4 million deaths<sup>3</sup>.

In Brazil, the Covid-19 disease was first identified on February, 2020 in São Paulo and rapidly spread through all regions of the country, causing serious crisis on the economy and public health. Since the beginning of the pandemic to end December 2021, about 22 million cases and 618.000 deaths were registered, with at least 1 in 9 residents infected, and 1 in 341 residents dead from the disease<sup>4</sup>.

In order to face the pandemic, in February 2021, the Ministry of Health launched the national covid-19 vaccination

campaign, by using the vaccines Astra Zeneca (Oxford) and Coronovac (Sinovac-Butantã), after approval from Agência Nacional de Vigilância Sanitária (ANVISA)<sup>5</sup>.

The Covid-19 vaccine can be considered “newly” biological preparations. So, is reasonable that safety, efficacy and side-effects surge as first concerns by part of the population, including the health-care workers (HCWs).

It happens that, during the emergence of the Covid-19 pandemic, a big wave of information and misinformation about covid-19 was disseminated on the social media, reaching to the point that the WHO Director General Tedros Adhanon coined the new term “infodemy”. It refers to a situation when overload of information which might be true or false, making for many people difficult or even impossible to decide what to believe. Furthermore, the rapid distribution of false information and conspiracy theories on the social media were recognized as factors that favored vaccine hesitancy<sup>6,7,8</sup>.

Vaccine hesitance (VH) causes concerns due to the possible fall on vaccine uptake, impacting the efforts to control the pandemic<sup>8,9</sup>. In the Portuguese-speaking countries Covid-19 VH was found to occur in 21.1% of people, being influenced mostly by conspiracy theories, stress,

misinformation and individual reasons<sup>9</sup>. It is so important that World Health Organization declared in 2019 that VH was one of the ten greatest global health threats, alongside antimicrobial resistance, human immunodeficiency virus (HIV), and climate changes<sup>6</sup>.

Historically, hesitation and resistance to vaccines in general are phenomena that accompany epidemics around the world. One of the most dramatic examples of vaccine resistance was the so-called “Vaccine Revolt”, which mobilized population of Rio de Janeiro against the mandatory vaccination for smallpox in 1904. During the riots hundreds of people were arrested or deported to the north of the country, while several people were dead after confrontation with the security forces<sup>10</sup>.

At that time, circulated a belief that smallpox vaccine could cause bovine appearance in the vaccinated people. This was perhaps the first fake news in the history of vaccination in Brazil and probably originates abroad, since cowpox vaccination was already a common practice in Europe and in United States. This hoax was illustrated in a pictorial cartoon created in 1802 by the artist James Gillray, depicting the body changes after cowpox shots (Figure 1).



Figure 1: “The cow-pock, or-The wonderful effects of the new inoculation!”

Image: James Gillray/Anti-Vaccine Society Print. [Library of Congress, Prints & Photographs Division, LC-USZC4-3147.Public domain. No known restriction on publication; [https://upload.wikimedia.org/wikipedia/commons/d/d6/The\\_cow\\_pock.jpg](https://upload.wikimedia.org/wikipedia/commons/d/d6/The_cow_pock.jpg)]. [Attribution Noncommercial 4.0 International (CC BY-NC 4.0)].

HCWs comprise a heterogeneous group of professionals, showing high variability rates of VH according to different professions and countries. In the Middle East Region (Kuwait, Egypt, Saudi Arabia, Qatar, Jordan, Iraq, Bahrain, Lebanon, Syria, and others), cross-sectional studies among HCWs showed VH rate as high as 60%<sup>11,12,13</sup>. According to these studies, the main reasons for hesitancy were lack of vaccine information, fear of side-effects, mistrust on governmental vaccination policies, individual beliefs and political reasons.

Although veterinarians don't deal in frontline of Covid-19 settings, they are part of the HCWs and were included within the priority group to receive covid-19 vaccination in most countries.

From the best of our knowledge there are no specific reports on the behavior of these professionals over acceptance of Covid-19 vaccination. Vets also face the problem of vaccine hesitation and resistance to immunization of their patients on the part of animal's owners<sup>14</sup>. Unfortunately, just like occurs with human beings, the animal vaccination is increasingly refused by pet owners as observed in the United Kingdom, where about 25% of dogs and 35% of cats were reported as not vaccinated or under-vaccinated<sup>15</sup>. So, in the context of the actual pandemic is important to assess how well these professionals behave when they are faced with the need for themselves to receive a new vaccine.

## OBJECTIVES

To estimate the rates of acceptance and hesitancy of Brazilian veterinarians to receive the covid-19 vaccine by the beginning of the national vaccination campaign.

## METHODOLOGY

**Study design:** Cross-sectional survey to evaluate the levels of VH among Brazilian veterinarians to Covid-19 vaccination. A voluntary anonymous online survey was conducted from November, 2020 to March,

2021, using a professional closed group from the social network Facebook.

**Sampling:** the online program RaoSoft® was used to calculate the appropriate sample size. From a universe of 3.200 members, with at least 50% predict response, 5% margin of error, the minimum calculated sample size for a confidence level of 95% was 344 people, and the final number of respondents was 351.

**Study tool:** a predesigned pretested questionnaire.

**Inclusion criteria:** Those who are willing to consent for the study.

No personally identifiable information was collected or stored. Descriptive statistics was employed to summarize and report the responses received and data was expressed as numbers and percentages, as appropriated.

The study outcome was to find the level of VH, according to the criteria of the SAGE Working Group on Vaccine Hesitancy (16) that vaccine hesitancy refers to delay in acceptance or refusal of vaccination despite availability of vaccination services. The participants were asked if they were willing to receive the covid-19 vaccine by using the single question: "After approved by the Agencia Nacional de Vigilância Sanitária, do you will accept to take the Covid-19 vaccine, once it is disponible?" The responses options were: A) Yes; B) Not now; C) No.

## RESULTS

Overall, the participants responded Yes: 239 (68.09%); Not now=81 (23.08%); No=6 (1.71%); No Chinese vaccine= 25 (7.12%) = Total 351. In this case, the rate of vaccine acceptance was 68.09%, while the rate of hesitancy reached 31.1%.

## DISCUSSION

The outcome for this study was to find the level of acceptance and hesitancy by part of veterinarians to receive the covid-19 vaccine, by the beginning of national vaccination campaign in Brazil.

The final results indicated that about two-thirds of respondents accept vaccination, while one third was hesitant. Among the hesitant, the called “Chinese vaccine” was motif to refusal by 7.12% of respondents, suggesting probable political bias.

From the scenario of covid-19 pandemics, it seems paradox that the high rate of VH among vets, reaching about three times greater than the 10.5% found among Brazilian general population<sup>17</sup>, given that both studies were carried out within a similar period of time.

In relation to different groups of HCWs, several reports assessed the VH to Covid-19 vaccine and the results were highly variable among countries. A large cross-sectional online study made in China, precisely the birthplace of the pandemic, found that 76.98% of HCWs accepted vaccination while 18.5% were hesitant (11). In Italy, according to a national online survey<sup>18</sup>, about 67% of HCWs declared to accept COVID-19 vaccination, while 33% were hesitant, being very close to our findings. From the part of Brazilian medical students, an online survey found high acceptability to vaccination (84%), and 16% hesitation, revealing high confidence in the immunization and perception of the risk of infection if not vaccinated<sup>19</sup>. In the USA an investigation among dental (DS) and medical students (MS) showed that 45% of DS and 23% of MS were hesitant, respectively, to receive the vaccine. In other words, MS were more likely than DS to accept vaccination<sup>20</sup>.

The problem of covid-19 VH is complex and has been considered a pervasive issue in the general population as well as among HCWs across the globe<sup>21</sup>.

Covid-19 is a devastating illness. Similar to other infectious diseases of humans (smallpox, polio, and measles) and of animals (Rinderpest and Foot-and-mouth disease), the eradication or control has depended largely on high vaccine coverage, as shows the glorious history of fighting against infectious diseases<sup>22</sup>.

In the context of pandemics, the acceptability of vaccines is a crucial factor to achieving good levels of coverage for the success of its control/eradication, and the role of HCWs is considered pivotal in educating their patients and other populations regarding immunization. If they are resistant or hesitant to immunization, could generate distrust and potentially reduce vaccination success<sup>23</sup>.

This study has limitations because it represents a specific period of time, in view that the behavior of the pandemic varies across time as well as the perception of people, as new scientific information accumulates. On this respect, most of references in this work are related to as the same period of time, when the investigations were performed, i.e., by the beginning of vaccination campaigns around the globe.

There are some legitimate reasons for VH to Covid-19 vaccination, because at the time of the survey, covid-19 vaccines were “new” biological preparations, when public information was relatively limited. Indeed, it is logical that safety, efficacy and side-effects rise as the main concerns about its use. In consequence, these concerns may affect negatively vaccine’s acceptance by the general population, as well as by part HCWs.

Despite natural concerns over immunizations, the availability of vaccines in general has been seen as a-ray-of-hope for the humanity, and is one of the most cost-effective ways to avoid many transmissible diseases. It currently prevents 2-3 million deaths a year and a further 1.5 million could be avoided if global coverage of vaccinations is improved<sup>6</sup>.

Since health professionals, have good opportunities to influence vaccine uptake by parte of people, they can help to improve the success of immunization policy. On contrary, the greater the HCWs hesitation, greater is negative impact on the vaccine coverage. However, vaccine hesitancy is dynamic by nature and may change with time, depending on trust of

population in the vaccination programs, contributing to positive health behavior<sup>24</sup>.

## CONCLUSION

This study demonstrated a positive but moderate level of acceptance of covid-19 vaccination by part of Brazilian veterinarians. Considering that vets share an important role within the modern concept of One Health, the uptake vaccines for themselves, may be favorable or unfavorable from the veterinary and public health point of view. There is a need to improve strategies to increase the trust on the safety and efficacy of covid-19 vaccines among the professionals.

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