



US veterinarians' perceptions of discussing COVID-19 vaccination with animal owners during routine visits

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ARTICLE INFO

Keywords:

COVID-19
Vaccine hesitancy
Disparities
Prevention

ABSTRACT

COVID-19 vaccination uptake is disproportionately lower among rural, politically conservative, and underserved individuals in the United States. Engaging this population requires leveraging unique potential human health advocates, like veterinarians. Between September and October 2021, 103 veterinarians responded to open-ended prompts to assess providers' willingness and potential barriers to discussing COVID-19 vaccination within a veterinary visit.

Veterinarians perceived they had a public health role in providing reliable and accurate COVID-19 information, including information related to approved vaccines. However, veterinary practitioners were aware of numerous potential barriers to having such discussions within a clinical visit (e.g., scope of practice concerns, shifting focus away from the animal, politicization of vaccination). Findings indicate policy efforts, aligned with the One Health initiative, are needed to address the role of veterinary medicine in human health care following catastrophic events, like the COVID-19 pandemic. Similarly, veterinarians require tailored vaccine materials that can be utilized within the clinic or community setting.

1. Introduction

COVID-19 continues to be prevalent in the US and global disease landscape. This virus has maintained itself as a leading cause of death in the United States with urban, suburban, and rural areas [1]. However, evidence from the CDC shows that rural communities have been disproportionately affected by COVID-19 when compared to urban settings [2]. These differences have been exacerbated by cultural norms, attitudes, and an unavailability of medical or public health resources [3,4]. Similarly, health outcomes in rural and underserved areas are influenced by a myriad of other factors, including an older population, higher comorbidity rates, lower access to healthcare, as well as increased reluctance towards mitigation strategies [5,6].

However, the spread of COVID-19 can be mitigated through use of vaccines [7]. The emergence of SARS-CoV-2 variants, such as Omicron, is linked to uncontrolled disease transmission. As such, suboptimal vaccine uptake in the US and the under supply of vaccines globally may influence variant development [8]. Additionally, rural and underserved communities have a lower vaccine uptake rate compared to their urban and suburban peers [2]. This decreased use of the vaccine can be attributed to the lack of access to health care providers and inadequate

health information within these economically marginalized areas [9,10]. There is also a general distrust within rural and underserved communities of governmental institutions and any actions perceived to intrude on individual liberty [11,12]. Mistrust in medical institutions or belief in conspiracy theories may also play a role in hesitancy to get the COVID-19 vaccine [13–15]. These factors contribute to a decreased vaccination rate within rural and underserved communities.

Vaccine hesitancy interventions have too often fallen within a narrow focus on physician-initiated interventions that are unsuited for rural and underserved communities given their healthcare access [13,16,17]. These findings underscore the need for alternative community outreach by local and trusted authorities. One approach is to leverage local veterinarians and veterinary professionals. Veterinarians may receive questions from clients regarding human health [18]. Clients hold veterinarians and their knowledge in high regard as they trust the care of their livestock and pets to the veterinarian's capabilities [18,19]. Previous research has highlighted the potential for veterinarians to serve as human health advocates. For example, Reding et al. noted both rural farmers and veterinarians responded favorably to the delivery of skin cancer information by veterinarians as part of routine dairy herd health visits [18]. Similarly, work by Schelling et al. within Sub-Saharan Africa

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had documented the mutual advantages from collaboration between public health staff and veterinary professionals to deliver human and animal vaccines within low income and low resource settings [20].

Additionally, numerous national veterinary associations support conditions that allow veterinarians to use their knowledge and skills to aid human health during catastrophic events or emergency situations [21,22]. Veterinary researchers and practitioners have highlighted the various roles the profession holds in mitigating COVID-19 and other infectious disease and zoonotic diseases [23–26]. Similarly, early research has demonstrated the experiences of veterinarians during the COVID-19 pandemic and the impact on veterinary practices. However, fewer studies have documented the experiences of veterinarians as part of larger COVID-19 efforts—including dissemination of accurate information and administering vaccines to humans [27]. With a One Health perspective, veterinarians are in a unique position to offer their expertise to further overall health of both animals and humans as well as the environment [28].

2. Current study

Given the nascent literature surrounding vaccine uptake, specifically concerning COVID-19, within rural and underserved communities, we sought to qualitatively assess perceptions of veterinarians in discussing COVID-19 and vaccines with animal owners during routine visits. The present study analyzes responses to open-ended questions. Utilizing these responses, this study aims to identify potential opportunities to leverage veterinarians as human health advocates in a larger public health effort to enhance COVID-19 vaccine uptake.

3. Materials and methods

3.1. Participant recruitment and data collection

Between September and October 2021, veterinarians located in the United States completed a cross sectional, online questionnaire to assess perceptions of veterinarians (i.e., DVM or VMD) in discussing COVID-19 and vaccines with animal owners during routine visits. Participants were recruited through Internet-based direct marketing (e.g., advertisements placed on social media sites), dissemination through veterinary listservs, and peer referral. Participants were eligible if they were 18 years of age or older, a resident of the United States, and a licensed veterinarian. The online questionnaire took approximately 20 min to complete, and participants were offered the opportunity to enter a drawing to win one of ten \$50 gift cards. The home university’s institutional review board approved the study, and each study participant completed an informed consent process.

3.2. Online survey

Participants responded to open-ended questions which assessed a provider’s willingness and potential barriers to discussing COVID-19 vaccination within a veterinary visit. Respondents were provided with the following information: “We are interested in the role veterinarians perceive themselves to fill regarding the COVID-19 pandemic, specifically related to providing information that could increase vaccine uptake (e.g., dispelling common misconceptions, speaking with their personal physician, accessing resources).” Questions assessed participant comfortability (e.g., Within a clinical visit, what might make you more or less comfortable discussing the COVID-19 vaccine with clients?); concerns (e.g., What concerns might you have in discussing COVID-19 vaccination with your clients?); referral amenability (e.g., Would you be willing to recommend to a client that they should discuss with their medical provider about getting vaccinated for COVID-19?) and potential role of veterinarians (e.g., What role, if any, do you believe veterinarians should play in addressing the COVID-19 pandemic?). In addition to standard demographic questions,

participants were asked to report their influenza and COVID-19 vaccine status, clinic setting for which they practice, and agreement (5-point Likert scale) with the statement: “Veterinarians are human health advocates.”

3.3. Data analysis

Two research team members independently open-coded participant responses [29]. Consistency checks were conducted in order to assess reliability among the coders. Responses were analyzed separately for each question using an inductive approach to identify and interpret concepts and themes that emerged from these data. Concepts were the most basic unit of meaning from which our results were developed. Related concepts were grouped together to form overarching themes. We used the Statistical Package for the Social Sciences (SPSS) version 24 to analyze demographic characteristics and descriptive statistics (IBM Corp, 2016).

4. Results

4.1. Participant characteristics

As shown in Table 1, participants (N = 103) ranged from 26 to 73 years of age (M = 43.83), with most respondents identifying as women

Table 1
Full Sample Demographics, N = 103.

		%	Min	Max	Mean
Age			26	73	43.83
Gender	Male	21.4			
	Female	78.6			
Race/Ethnicity ¹	Black or African American	–			
	White	95.1			
	American Indian/Alaskan Native	–			
	Hispanic/Latino	–			
	Asian	5.8			
	Native Hawaiian or Pacific Islander	–			
	Other	1.0			
	Academic				
Classification of Practice Setting	Research/Teaching Clinic	15.5			
	General Practice/Private Clinic	68.9			
	Specialty Hospital/Care	2.9			
Location of Practice Setting	Other	12.6			
	Urban/Metropolitan	21.4			
	Suburban	43.7			
COVID-19 Vaccination Status	Rural/Small Town	35.0			
	No	7.8			
COVID-19 Brought up by Owner during Visit	Yes	91.3			
	No	6.0			
Received Question from Owner Regarding COVID-19 During Visit	Yes	94.0			
	No	13.0			
Veterinarians are Human Health Advocates	Yes	87.0			
	Completely Agree	48.9			
	Somewhat Agree	40.4			
	Neutral / No Opinion	5.3			
	Somewhat Disagree	5.3			
Health Advocates	Completely Disagree	–			

¹ Participants could select more than one category; each group is presented as % of total sample

(78.6%), and White (95.1%). Most providers practiced in either a suburban (43.7%) or rural (35%) setting. Additionally, more than 90% had been vaccinated for COVID-19. The majority of providers indicated they either completely agreed (48.9%) or somewhat agreed (40.4%) that veterinarians are human health advocates.

4.2. Qualitative findings

Several factors were identified that could impact the acceptability of discussing COVID-19 and related vaccinations with veterinary clients. In total, 3 themes and 9 subthemes were identified during data analysis. The identified themes and illustrative quotes are presented in Table 2.

4.3. Clinical practice

4.3.1. Scope of practice

Although participants noted the impact of COVID-19 on their local community, respondents highlighted that providing potential human health recommendations during a clinic visit were 1) outside their scope of practice as a veterinarian and/or 2) were more appropriate for a client to have with their primary care physicians. For example, respondents labeled COVID-19 as a “human disease” in which veterinarians should not be providing advice on within a professional setting. For those respondents practicing within rural communities, participants noted these communities were experiencing a shortage of healthcare providers and as such, clients may not be currently engaged with medical systems. As such, rural respondents noted a necessary role in being a resource to members of the community; however, remained concerned about their legal ability to provide medical recommendations. In contrast, veterinary providers in urban and suburban areas discussed the availability of medical and public health resources to answer individuals COVID-related questions for which they could refer clients.

4.3.2. Shifts focus away from animal

Regardless if a respondent felt it was appropriate to provide COVID-related information during a veterinary visit, most expressed concern that such conversations would detract from the purpose of the clinical visit—providing care to an animal. Similar to the experiences of their counterparts providing medical care to humans, veterinarians within small animal clinical settings noted the limited time in which they had to physically examine and/or provide treatment to the animal. Discussions related to COVID-19 were perceived as further limiting their time with each animal and, in cases where owners were not receptive to such discussions, could lead to treatment recommendations for the animal not being adopted by the owner, thus ultimately affecting the care the patient would receive.

4.4. Politicization of vaccination

4.4.1. Hostility and harm to veterinary-client-patient relationship

Participants discussed the potential harm to the relationship between the client and the veterinarian as the largest barrier to discussing COVID-19 vaccination with clients. Veterinarians noted the politicization of COVID-19 and vaccination has the potential to create an adversarial relationship with clients, particularly for those practicing within more rural or socially conservative communities. The larger cultural context surrounding the COVID-19 vaccine and the duration for which the vaccine has been available was noted to be an additional barrier given that clients had more than likely formed their decision whether to be vaccinated or not.

4.5. Veterinarians' public health role

4.5.1. Communicating with owners about COVID-19

When discussing COVID-19 with owners, respondents believed their public health role to encompass 1) answering common COVID-19

Table 2
Discussing COVID-19 and Vaccination with Veterinary Clients.

Theme	Sub-theme	Illustrative quote
Clinical practice	Outside scope of practice	<p>While this is a topic that everyone should be engaged in socially, I do not think that introducing COVID-19 as a talking point in regular veterinary visits is appropriate.</p> <p>It isn't my place to have that conversation about their human health. I am only there to discuss pet's health.</p> <p>I think this is a discussion a client should have with their family doctor who knows their medical history and can answer their medical related questions better than I can.</p> <p>Yes; everyone should discuss with their medical provider whether the COVID-19 vaccine is right for them or not and the associated risk-benefit. COVID-19 is a human disease (with some instances of it in big cats), as a veterinary I cannot legally treat humans. Thus, I should not be giving human medical advice in a professional setting. I would encourage people to talk to their human doctor.</p>
	More appropriate for primary care physician	<p>Yes, but we don't have time for it. And we need to keep the faith of our clients in us - for the minority of clients who are strongly anti-vax, they are not going to listen to us anymore, they're not going to follow our recommendations, the diagnostics / treatment that their pets need won't happen, and now the pet will suffer because we brought up a controversial topic (that we didn't need to discuss in order to help the animal patient).</p> <p>No. While I am willing to answer questions if people have them, I am afraid by bringing up the topic to someone I could drive them away from getting the veterinary care their pet needs.</p>
Veterinarians' public health role	Shifts focus away from animal	<p>I can answer questions about the general importance of vaccines and preventative medicine.</p> <p>Educating people on the virus and easing fears.</p>
	Answering common COVID questions	<p>We can educate about the zoonotic aspect of the disease and clinical signs in other species.</p> <p>I think we can help spread accurate information to those in our community and help dispel any myths or misinformation about the vaccine. We are health care professionals so I think supporting our public health and human medical counterparts is essential. This can occur in a variety of ways including volunteering for vaccine clinics as well as simple things like trying to dispel misinformation when encountered.</p> <p>Dissemination of information. Some people view us as an unbiased resource for medical information. Again, it is within our oath to promote public health.</p> <p>Trusted source of information; point clients to reliable, scientific and fact-based information; provide recommendations and care for pets</p>
	Dispelling COVID misconceptions	
	Providing reliable information	

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Table 2 (continued)

Theme	Sub-theme	Illustrative quote
	Need for resources for veterinarians	<p><i>positive for and symptomatic for SARS-CoV2.</i></p> <p><i>Vaccine handouts/recommendations/guidelines from the CDC and associated public health agencies and authorities.</i></p> <p><i>Well written easy to understand information by the CDC, WHO, AMA and or AVMA.</i></p>
Politicization of vaccination	Harm to client-provider relationship	<p><i>No. I don't really have time and don't want to create an adversarial relationship with my client in an already stressful visit.</i></p> <p><i>No, because it would be branded as political and terrible for undermining the veterinarian-client-patient relationship in my area. I'm sure it'd work better in other areas, but it would be very badly received in my location.</i></p> <p><i>That it would lead to confrontation/tension in the relationship and make me less able to work with them as a client to help the pet.</i></p>
	Hostility towards vaccination conversations	<p><i>Those who are unlikely to change their mind and get angry about the subject being addressed.</i></p> <p><i>My only concern is having conversations with people who have politicized the topic and have polarizing, passionate views on the topic.</i></p>

questions, including the risk of COVID-19 to pets; 2) dispelling COVID-19 misconceptions; and 3) providing reliable and medically accurate information. Veterinarians noted they are often viewed by community members as a source for unbiased medical information and a steward of public health. Participants thus noted experiences during the current pandemic in which they provided factual resources and information to dispel COVID-related misconceptions and misinformation.

4.5.2. Need for COVID-related resources for veterinarians

Respondents underscored the need for trusted and reliable resources (e.g., COVID-related handouts, guidelines) geared towards veterinary practitioners from traditional public health entities like state health departments and the Centers for Disease Control and Prevention; however, participants specifically noted a preference for materials from the American Veterinary Medical Association and similar veterinary entities.

5. Discussion

Our study investigates veterinarian's perceptions of discussing COVID-19 and the vaccine with animal owners during routine visits. Our results, which are similar to other topical studies (e.g., violence, antimicrobial resistance) [30,31], suggest that the general population of veterinarians perceive they had a public health role in providing reliable and accurate COVID-19 information, including information related to approved vaccines. However, veterinary practitioners were aware of numerous potential barriers to having such discussions within a clinical visit.

At the forefront of these barriers were concerns related to their scope of practice as a veterinarian and the potential of opening their practice to enhanced risks of liability. The One Health initiative demonstrates the importance of veterinarians within the larger healthcare landscape and underscores that members of the profession possess necessary skills to reduce human loss of life during catastrophic events, including the COVID-19 pandemic [28]. Findings further evidence a need for state and

national authorities to address licensing, liability, and policy which limit the utilization of veterinarians as supplementary sources of knowledge and preventive care for human health care during catastrophic events [21]. For example, the Public Readiness and Emergency Preparedness Act (PREP Act) authorizes the secretary of health and human services to issue a declaration to provide liability immunity to certain individuals (e.g., veterinarians) and entities against any claim of loss caused by, arising out of, relating to, or resulting from the manufacture, distribution, administration, or use of medical countermeasures against diseases, threats and conditions identified in the declaration [32]. A March 12, 2021, amendment to the PREP Act declaration allows veterinarians and veterinary students to administer COVID-19 vaccines to people [33].

Similar to their physician counterparts [34], veterinarians observed that opinions related to the COVID-19 vaccine were increasingly polarized and it was common to see community members experience and express strong emotions. As demonstrated within other studies, participants felt it was important to maintain the clinical rapport rather than engage in conflict with vaccine hesitant clients [34,35]. As the COVID-19 pandemic continues and as new infectious diseases emerge, the subject of vaccines will remain emotionally and politically charged. One recommended approach to building vaccine confidence is to acknowledge client's emotions (e.g., fear, anxiety) while emphasizing the stringent safety and efficacy standards of COVID-19 vaccine development process [35]. Moreover, messaging from local providers, like veterinarians, is necessary to combat COVID-19 misinformation. The Lancet Commission on Vaccine Refusal, Acceptance, and Demand in the USA has underscored the need for activities that support accurate COVID-19 and vaccine messaging that is catered towards hesitant communities [36]. Particularly within rural and underserved communities, which are comprised of small populations and tightly knit structures [37,38], there is continued need to evaluate the role of veterinarians within public health prevention frameworks given their trusted role within the community. Veterinarians can address disease-related stigma, discuss the benefits of vaccination, and provide accurate, up-to-date epidemiological information in the local community. This requires the development and tailoring of COVID-19 materials to be utilized by veterinarians within their practice, to be distributed to clients during a clinical visit, or for use when engaging community stakeholders. For example, after the collection of our research data, the American Veterinary Medical Association (AVMA) released a toolkit (e.g., poster for clinics, social media messaging, tips to talking to clients) for veterinary practitioners to promote public health by encouraging vaccination [39].

Further research is required to assess veterinarians' perspectives on their role in the promotion of public health, particularly from a professional ethics perspective. The veterinarian's oath, within the US, specifically states in being admitted to the profession of veterinary medicine one would "solemnly swear to use [their] scientific knowledge and skills for the benefit of society through... the promotion of public health." Although most participants (89.4%) either completely or somewhat agreed that veterinarians are human health advocates, our findings highlight potential internal and external barriers to promoting the public's health during the COVID-19 pandemic. Nieuwland and Beijboom [40] note the rise of One Health further enhances the interdependence of human and non-human health which requires the expansion of veterinary ethics. Considering this, we believe our findings bring forward a critical question— Are there professional ethical issues that arise if a veterinarian is not actively engaging in promotion of public health?

Our study is not without limitation. Participation was voluntary and the views of those volunteering to complete the online questionnaire may not reflect the larger population of practicing veterinarians. Thus, veterinarians who opted to complete the questionnaire may have different viewpoints of veterinarians choosing not to participate. Similarly, our sample was comprised of relatively few veterinarians who had

not yet received the COVID-19 vaccine. This limited our ability to observe potential differences between vaccinated and non-vaccinated veterinary providers.

6. Conclusion

Even within the confines of these limitations, study findings provide insights into the perceptions of veterinarians in discussing COVID-19 and the vaccine with animal owners during routine visits. Further research might explore animal owners' perceptions of receiving information about COVID-19, vaccination, and other human health concerns from their veterinary providers. Our findings further support policy efforts to address the role of veterinary medicine in human health care following catastrophic events.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

CRedit authorship contribution statement

Randolph D. Hubach: Conceptualization, Data curation, Formal analysis, Methodology, Writing – original draft, Project administration.
Rachel Tonne: Conceptualization, Data curation, Formal analysis, Writing – review & editing.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgments

The authors wish to extend their thanks to the Purdue University Libraries Open Access Publishing Fund for its support of this project.

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