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Surveillance and Reporting of Zoonotic Diseases: Perception of Partnership and Communication Between and Among State Animal Health Officials and State Public Health Veterinarians

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The transmission of zoonotic diseases from wild and domestic animals to human beings is considered a global public health threat. Developing guidelines to establish communication between and among animal health and health public agencies is paramount. Constant monitoring of the exchange of information and the reporting of zoonotic disease episodes constitute effective surveillance techniques. However, past research has indicated that communication and reporting methods vary widely among U.S. states, with some states having minimal or no collaboration between and among animal health professionals and public health agencies. Therefore, guided by a social network theory, the current research examined whether communication structures and the assignment of roles and responsibilities between and among agencies had improved since a prior survey was conducted in 2005. Survey research was used to gather data from 41 state animal health officials and state public health veterinarians. Chi-square and Fisher's Exact Test analyses identified a significant increase in frequency of meetings and satisfaction in communications since 2005. In addition, roles and responsibilities of the agencies as well as the agencies themselves were determined to have become more clearly defined. Based upon the analyses, the findings indicate that the perception of partnership and communication between and among animal and public health agencies has improved since 2005 with regard to zoonotic disease surveillance and reporting. This study reviewed these findings and placed them in the context of enhancing social change initiatives through improved communication, surveillance, and reporting between and among animal health officials. Finally, limitations of the study are discussed, and recommendations for action and future research are offered.

Keywords: *infectious diseases; public health; surveillance; zoonoses*

Introduction

Research has suggested that emerging disease episodes are on the rise, many involving zoonotic, or species-jumping, infectious agents, and that zoonoses with a wildlife reservoir constitute a major public health problem (Murphy, 1998). Wild animals seem to be involved in the epidemiology of most zoonoses and serve as major reservoirs for the transmission of zoonotic agents to domestic animals and humans (Kruse, Kirkemo, & Handeland, 2004).

The goal of this research was to assess the current working relationship between and among animal health agencies in an effort to ascertain whether having a standardized procedure for sharing information and meeting with wildlife officials might further the objective of strengthening the public health infrastructure to ensure a more rapid response time for more effective containment and control measures for zoonotic disease emergencies. It was hypothesized that the results could lead to improved population health by reducing or eliminating the public health impact of a zoonotic disease outbreak.

Method

Participants

Sampling methods were similar to those used in Lynn's (2005b) study and involved contacting professionals in the same states as the original survey. In the present study, a total of 88 surveys were sent via e-mail from a contact list of e-mail addresses obtained from the USDA Animal and Plant Health Inspection Service website (2008) and from the SPHV website (2008). Eight were returned as undeliverable. The return rate was 51.25%. Thus, the final sample comprised 41 participants who were state animal health officials, state public health veterinarians, state epidemiologists, or livestock commissioners. The sample comprised 46% from the SPHV ($n = 19$), 48% from the SAHO ($n = 20$), and 6% from the Other category because some respondents indicated that they were either state epidemiologists, livestock commissioners, or held both titles as state veterinarian and public health veterinarian. The distribution of number of years in their current position was 14.6% for less than 2 years ($n = 6$), 36.6% for 2 to 5 years ($n = 15$), 24.4% for 5 to 10 years ($n = 10$), and 24.4% for more than 10 years ($n = 10$).

Materials

The survey used for this study, which is available upon request from the second author, was based upon a survey developed by the Interagency Working Group (Lynn, 2005b) and designed to assess and improve communication and strengthen partnerships between and among animal health agencies. In addition, demographic information was obtained by asking the respondents to identify whether they were state animal health officials or a state public health veterinarians and how many years they had been working in that capacity.

A 5-point Likert scale was used to measure levels of satisfaction of current communication (highly dissatisfied to highly satisfied), and a 6-point Likert scale was used to measure current frequency of communication (weekly, monthly, quarterly, 2x/year, yearly, never). Participants were also asked (yes/no) whether any standard operating procedures had been put into place for agencies to follow in the event of a zoonotic disease emergency.

Procedure

The survey was administered by requesting that the identified respondents connect via e-mail to SurveyMonkey.com, an online service, to complete the survey. This procedure facilitated the capture of raw data, thus enabling the researchers to download the data directly into a Microsoft Excel spreadsheet.

Results

Data were collected and analyzed from the survey to assess communication processes and frequencies. Specifically, data on the mode of communication (i.e., face-to-face meetings, phone calls, or electronic communications) and how often such contact was made (i.e., weekly, monthly, quarterly, or yearly) were collected and analyzed. Data that described the roles and responsibilities of the members of the specific animal health and public health agencies (e.g., animal health officials in state departments of agriculture or public health veterinarians in the state public health offices) also were collected and analyzed. Results of the survey also were compared with the results of a similar survey conducted by Lynn (2005b).

In regard to whether written plans were in place for issuing joint communications from the state agencies to the public, results indicated a significant increase in the issuance of joint communications from 2005 to 2009 (Fisher's Exact Test [2 tailed], $p = .005$) from 53% to 73%. In regard to whether there was an established plan in place for each agency's involvement in surveillance and response, results indicated a significant increase in the percentage of agencies that had created and established respective plans detailing each agency's involvement during a zoonotic disease emergency (Fisher's Exact Test [2 tailed], $p < .001$) from 30% to 78%. Finally, a comparison was made between the percentage of respondents who indicated whether roles and responsibilities of the members of each agency's involvement in surveillance and response were adequately defined. Results indicated a significant increase in the percentage of agencies that had established clearly defined roles and responsibilities for members of each agency's involvement in surveillance and response in regard to a zoonotic disease emergency (Fisher's Exact Test [2 tailed], $p < .001$) from 67% to 83%.

Discussion

This study was conducted to examine the current communication structure and relationship between and among members of animal health agencies on a statewide level. Having standard procedures in place for coordinating a response to a zoonotic disease emergency can help to further the mission of public health agencies in creating and promoting a healthier nation and building a stronger public health infrastructure. Lynn (2005a, 2005b) asserted that the lack of standardized procedures for communication, surveillance, and response to zoonotic disease emergencies, as well as the relationships between and among state animal health agencies, including wildlife offices, were areas in need of further study and recommendation (Lynn, 2005a, 2005b).

As previously described, the theoretical framework of this study showed that where communication levels have improved and standard procedures have been put in place through written plans, more efficient partnerships have been developed. Using a social network analysis, this study sought to identify the characteristics of the networks structure, thereby influencing the availability of information to individual organizations and the system as a whole. Gibbons (2007) found that even though the building of strong relationships between and among new partners may start with small interventions, it has the potential to affect the broad public health network exponentially. The data

from this survey appear to support the hypothesis that when a more standard procedure exists, a more rapid response time for more effective containment and control measures with regard to zoonotic disease emergencies may occur.

Limitations of the Study

One of the limitations of this study was having the respondents answer the survey questions without having knowledge of the survey that was conducted in 2005. Contact information obtained from the SPHV (2008) website and the USDA:APHIS (2008) website indicated that there had been personnel changes during the time frame between surveys. Although knowledge of the original survey was not necessary to complete the current survey, some respondents may have felt limited in their ability to recall previous disconnections between and among agencies.

In addition, this current survey garnered a 51% return rate, whereas the original survey from 2005 garnered a 74% return rate, thereby decreasing the external validity of the survey instrument. The current list of contact information provided from the SPHV (2008) and the USDA:APHIS (2008) websites provided names and e-mail addresses for each of the 50 United States; however, several states listed either a state animal health official or state public health veterinarian, but not both. Although reminders were sent approximately 2 weeks after the original survey invitation was sent, the return rate remained at 51%.

Recommendations for Action and Further Study

As public health must increasingly navigate through the influx of emerging and reemerging infectious diseases, it becomes more imperative to bring together the agencies that provide oversight and investigation in zoonotic diseases. Animal health agencies and public health agencies must continuously work together to strengthen their relationships and work collaboratively on animal and human health issues. Zoonotic diseases have become a growing threat to the nation's health. Environmental conditions, global travel and trade, growth of animal and human populations, economic and ecological conditions, and bioterrorism have contributed to the increase in zoonotic disease transmission. To keep pace with this increasing public health concern, it is of paramount importance that leaders and professionals at the local, state, and federal government levels closely monitor the effectiveness of zoonotic disease surveillance and reporting. Information not only about disease transmission and incidence but also about the effectiveness of different health agencies to work closely together must be gathered and disseminated on a frequent basis.

The results of this study pointed to an increase in the level of collaboration and efficiency of animal and human health agencies to share information and responsibilities and to be able to effect a response to a zoonotic disease emergency in a more timely and efficient manner. Zoonotic diseases are an increasing global threat. The widespread human infection with pandemic H1N1 has brought the threat of zoonotic disease transmission and its impact on public health to the forefront of public health discussion. Controlling and preventing this disease threat, along with many others, are clear indicators of the importance of developing and maintaining strong working relationships between and among animal health agencies. However, as suggested through the many comments of those respondents to the survey, where great strides have been made over prior disconnects, much work remains to be done. Public health must continually work to find and create stronger alliances between and animal and human health agencies in order to continue to build the public health infrastructure and maintain overall population health.

Conclusion

Zoonotic diseases impact animal and human populations, so animal and human health organizations cannot be regarded as separate entities. Knowledge, research, discoveries, and data with a focus on protecting the health of both populations need to be continuously shared across disciplines and agencies. The key to best practice is the ability and willingness of agencies to work cooperatively on a regular basis to disseminate information quickly and put into action the most rapid responses to zoonotic disease emergencies.

Cooperation and communication between and among agencies are paramount to building successful relationships and to protecting the health of the population. Previous research has identified a gap in collaboration between animal and human health agencies and also has indicated the various degrees of protocols for information sharing and data collection between and among different states. How animal and human health agencies work together will impact public health preparedness and public health measures. This research is a valuable contribution to the scientific literature on the topic of communication structures between animal and human health agencies on state wide levels. The data have contributed to positive social change in the public health realm by exposing communication gaps. It is only by exploring the whys and wherefores of these gaps that they will be narrowed and result in the creation of positive social change in terms of decreasing the likelihood of needless infection within animal and human populations. Although this study indicated that strides have been made to bridge the gap in previous disconnects between and among animal and human health agencies, it has lent itself to future studies that can further the mission of public health agencies to improve and protect the health of the human population.

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