

Evaluation of the effectiveness of One Health Approach to Zoonoses Management in Bhutan

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Introduction

Approximately half the human pathogens and emerging diseases are zoonotic. Outbreaks of zoonoses are a major concern to both animal and human health in Bhutan. The first outbreak of H5N1 virus in Bhutan occurred in February 2010. Subsequently, the H5N1 outbreaks were reported from several districts on the border with India. Rabies and anthrax outbreaks occur sporadically throughout the country on an annual basis. Although good One Health collaborative mechanisms have been initiated for Highly Pathogenic Avian Influenza (HPAI) and rabies, it is not known how effectively they are being implemented to manage zoonoses. Therefore, this study aimed to evaluate the extent of existing coordination and cooperation between the human and animal health sectors for zoonosis outbreak management.

Objectives

- Evaluate the One Health approach to reporting, investigating and managing zoonotic disease outbreaks in Bhutan.
- Evaluate how effectively the criteria were applied in zoonotic disease outbreaks of anthrax, rabies and HPAI that occurred during the past three years.
- Compare the effectiveness of collaboration for managing other zoonotic diseases to that for managing HPAI.
- Develop and recommend policy guidelines for an integrated One Health approach towards zoonoses management in humans and animals.

Methods

A survey questionnaire was designed and administered to animal and human health staff across all administrative divisions to evaluate the collaboration and cooperation between the two sectors. As a case study, the investigation and responses to outbreaks of rabies, anthrax and HPAI were evaluated. Specifically, the study focus was to evaluate the One Health approach in terms of: institutional setup, policy and legislations, outbreak management, knowledge and skills, communication and collaboration at all organizational levels of human and animal health sectors.



Figure 1. Clockwise from the top left: Training for HPAI response; Lesions of cutaneous anthrax; Stray dogs.

The study was conducted from August to October 2013 in the twelve districts of Bhutan that had reported one or more zoonoses outbreaks in the past three years.

All public health and animal health officials who were directly involved in the management of zoonoses outbreaks were included in the study, including: clinical officers, physicians, nurses, animal health supervisors, veterinarians, para-veterinarians and administrative officials at national, regional, district and sub-district levels.

A focal officer from each of the Ministry of Health, and the Ministry of Agriculture and Forests in all the selected districts was trained to collect questionnaire data. Questionnaires were sent to 750 eligible individuals from both ministries through the respective focal officers. Data were entered into Epi Info version 7 (CDC, Atlanta, US), and processed and analyzed using Stata version 12 (StataCorp. 2012. College Station, TX: StataCorp LP). Descriptive statistics, relative risk, chi-squared tests and stratified analyses were used for the analyses.

Results

The overall response rate of the survey was 63.8% (479/750), of which 36.1% were from the Health sector and 27.7% from the Livestock sector. Nine percent of the respondents were from national, 4.8% from regional, 24.2% from district, and 62% from *Geog* (or sub-district) offices. In terms of qualifications, 15% of the respondents had a formal degree and/or a master's degree, 29.8% had a diploma and 55.3% had certificate courses

either in animal husbandry or in human health. Among the respondents, 36.3% had served for less than 10 years, 29.4% for 20 years and 34.2% for more than 30 years in the service.

Approximately 77% of the respondents have never heard of One Health, and these people were mostly from paramedic or livestock administrative support groups. Amongst those who had heard of One Health, only 16% had captured health, livestock, zoonoses and multisectoral collaboration in their definition of it. Fifty-five percent of the respondents had dealt with one or more of the following: rabies, anthrax and HPAI; however, only 35.5% had participated in a joint response to outbreaks of any of these three diseases.

Based on the behaviours reported for outbreaks of zoonotic diseases in the past three years, the Public Health staff were more likely to collaborate with their Livestock Health counterparts than the other way around, after adjusting for the effect of number of years in service (RR of 4.4, 95%CI=2.7–6.1). Furthermore, staff who had served for more than 25 years were half as likely to collaborate as those who served for less than 25 years.

The majority of the respondents did not know about the existing formal collaborative response mechanism and standard operating procedures (77%). Similar proportions also did not know the existing national, regional, and district committees for zoonoses (rabies, anthrax and HPAI) management.

Discussion

Although these findings were from a subset of data (as data entry was not complete) the results indicate that the Public Health staff were more likely to collaborate with the Livestock Sector at all administrative levels than Livestock staff. This could be due to the fact that the Public Health staff are more qualified compared to the staff in Livestock sector. Furthermore, the respondents at the national and regional offices are fewer in number compared to those at the district and sub-district level.

The level of qualification and experience in service might be critical to a person's understanding of One Health and their ability to recognize how different elements influence and interact with one another within a whole. The concept of dynamic interdependencies among human, animal, environmental and ecological systems affecting the relationships among individuals, groups, organizations, and communities is complex.

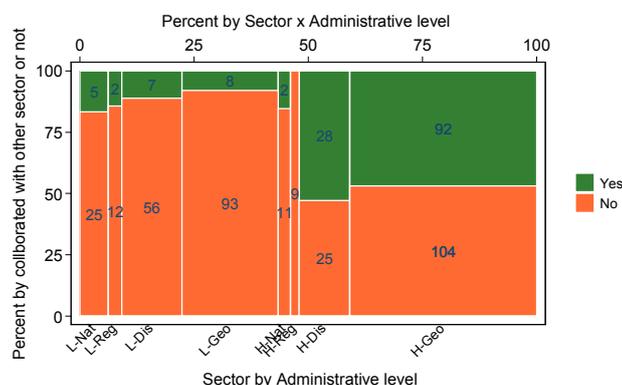


Figure 2. Percentage of participants who reported that they had collaborated (Yes) or not (No) with the other sector (Public Health with Livestock or vice-versa) at different administrative levels. KEY: L = Livestock; H = Public Health; Nat = National; Reg = Regional; Dis = District; Geo = Geo.

Lessons learned

Agreeing on the set of criteria to effectively evaluate collaboration and cooperation was difficult and there was no set of criteria developed elsewhere that could be easily transferred to our context. The existing collaborations need to be sustained through leadership commitment, and through creation of enabling trans-disciplinary and trans-sectoral approaches.

Recommendations

A strategic framework for a One Health approach is necessary to deal with emerging, re-emerging and high impact infectious diseases of humans and livestock. This becomes more evident when the sectors responsible for prevention and control of such diseases fall under different ministries. The One Health approach, which recognises the interaction of environmental factors in determining disease outcomes, can also be applied beyond infectious diseases.

Considerable challenges exist to implementing a One Health approach in Bhutan. Institutional arrangements for coordination and collaboration between the line agencies and operational departments need to be enhanced. Overcoming such institutional constraints requires strong and selfless leadership and commitment by the partners involved to implement a One Health approach. Sustained collaboration between donors and organizations responsible for implementing the One Health program is critical to its success.

Acknowledgments

The authors gratefully acknowledge Dr Joanna McKenzie and the team from the Massey University for providing technical guidance and mentorship, the World Bank and EU AHI facility for funding this study. We would also like to acknowledge the support and cooperation extended by the senior officials of MoAF and MOH, and all the participants of the study.