Nepal: A One Health Pilot Project for the Early Detection of Avian Influenza

DAHAL, Rojan\textsuperscript{a}, LERESCHE, Enrica\textsuperscript{a} and KAHN, Laura\textsuperscript{b}

\textsuperscript{a} One Health Initiative for South Asia
\textsuperscript{b} Princeton University

Abstract – The pilot project is designed to increase early detection of avian influenza in rural Districts in Nepal to prevent epidemic through the creation of a One Health Unit and community engagement to minimize economic losses and improve human and animal health. The project will pilot a One Health initiative in affected Districts, through a “One Health” community network, trained, supported and engaged with early detection and economic loss mitigation measures with key stakeholders. A District “One Health surveillance Unit” will detect, sample and map cases (animal - human) involving Civil Society Organisations and private health Institutions. A Central Rapid Response Team (RRT) will be technically strengthened to support to Districts. New tools will include mobile phones for health veterinary community workers; community reporting model for the “Ward committees” and District electronic surveillance tool including a GIS software to compile and analyse the data.

Keywords – avian influenza, One Health, surveillance

1. Background

Nepal is situated between India and China where Avian Influenza (AI) is endemic: it will take several years to control the virus in the Region. From March 2007 to July 2011, a project financed by the World Bank (WB) was implemented under the Global Program for Avian Influenza: the objective was to “minimize the threat in Nepal posed to humans by Highly Pathogenic Avian Influenza (HPAI) infection by controlling such infections among birds, especially domestic poultry, and to prepare for, control and respond to possible human infections, especially an influenza epidemic and related emergencies. Ten outbreaks were controlled within the project lifetime, which boosted the capacity to detect cases in animals and humans – the project aimed also to create a compensation mechanism for farmers. (WorldBank, 2013).

The first outbreak of H5N1 was described in Jhapa District in 2009, which was controlled during the project (WorldBank, 2014; Mohan, P. et al., 2013). After July 2011, the capacity to increase the detection of animal cases seemed to be on track, as 46 outbreaks had been controlled up to May 2013, control measures focusing mainly on preventive and control measures targeting animal cases (WorldBank, 2014; Mohan, P. et al., 2013). In the meantime, the detection of human case still seemed challenging: an independent evaluation of the WB project (May 2013) described modest results on the prevention and detection of human influenza, highlighting the difficulty to develop functional biosecurity laboratory facilities and the need to strengthen the public health sector (WorldBank, 2014; Mohan, P. et al., 2013). In addition, after May 2013, the Livestock Department (LD) of the Ministry of Agriculture as well as the Epidemiology and Disease Control Department (EDCD) of the Ministry of Health and Population (MoHP) were under harsh pressure: between May and June, 14 outbreaks were reported, out of which nine occurred in commercial farms (3'844 poultry died, 19'800 were destroyed) (FAO, 2013). In August 2013, no human cases of Influenza Like Illnesses had been reported by the EDCD (ECTAD, Aug. 2013; EDCD, 2013). By 12 November 2013, the Department of Livestock Services had reported 85 new outbreaks, leading to the death of 43'691 and the destruction of 1'372'309 affected poultry (ECTAD, Nov. 2013).

2. Nepal Vulnerability

Nepal has porous borders including 1236 km with China where, in 2013, 2 H5N1 deaths and 4 H7N9 cases were
reported. So far there is no reliable mechanism to detect human avian influenza cases in hard-to-reach Himalayan border areas or along the 1690 km Indian border (WorldBank 2013; WHO 2014). Nepal geography plays a role in access: a crucial issue is the need to involve communities and empower them in early detection and decision-making (MoHP and UNDP, 2010; UNDP, 2011; UNDP, 2009). The need for early case detection and response depends upon farmers’ willingness to report. Without any incentives, these efforts are fruitless (FAO, 2011). More than 75% of the people are dependent on agriculture in Nepal; this has direct and indirect relations with poverty (FAO, 2011; WorldBank 2013; UNDP, 2009). Nepal’s Human Development Index (HDI) is ranked 157 out of 187 countries (0.458 in 2011) and when adjusted for inequality, it falls to 0.301 (FAO, 2011; WorldBank 2013; UNDP, 2011). An early structured and systematic human health and veterinary collaboration is critical because surveillance Units report to their respective departments at central level separately and by the time the information is compiled, analyzed and shared between the Ministry of Health and Population (MoHP) Epidemiology and Disease Control Division (EDCD), the Ministry of Agriculture and Livestock (MoAL) Veterinary Division (VD), a vital amount of time has passed. The systematic coordination between health and veterinary sectors in the field needs to be strengthened and reformed to detect, prevent and control the disease (FAO, 2011).

3. The need for an innovative approach

Cost-effective preventive and control measures need to be developed. Timely outbreak responses are often challenged by the difficulty of identifying early animal to human or human to human disease transmission. Typically, in developing countries, the identification of outbreaks happens after significant losses to human and animal lives have already occurred as a result of insufficient human resources, ineffective surveillance mechanisms, and limited laboratory capacities. Throughout previous reported H5N1 epidemics (2009, 2012, 2013) the traditional response has been poultry case-detection and culling, combined with passives. Active case-detection of human cases with limited results (FAO, 2013; ECTAD, Aug. 2013; EDCD, 2013; ECDAT, Nov. 2013). Some of the Nepal poultry farms conducted unauthorized vaccinations to get rid of avian influenza without the approval of the government. Their efforts were ineffective in controlling avian influenza from Nepal. (The Himalayan Times, 2014)

Public health interventions to mitigate the effects of H5N1 resurgence are often synonymous with drastic culling if there is a suspicion that livestock is infected. This creates a negative attitude of the community towards interventions by the Veterinary Department. Poor communities are reluctant to report sick poultry, and have even hid them in order to avoid the economic losses linked to the destruction of the remaining livestock. The interventions are not understood by communities fighting for survival, and culling might result in un-economic shocks impossible to reverse, leading to vicious cycles of poverty. The involvement of rural/farmer communities in early detection of infected livestock is a challenge, but a critical goal to meet for a proper control (FAO, 2011; WHO 2007). Unfortunately, strategies to directly engage with the community at the grassroots level has not been developed in Nepal.

In addition, collaborative efforts between the health departments and the veterinary sectors would need to be developed further. Collaboration between these entities is crucial for early detection at the field level, combined with detailed laboratory data. Establishing such a link would provide a comprehensive picture of H5N1 as a threat to both animal and human health (WorldBank 2013; Eners et al., 2005). Creating a “One Health Surveillance and Response Unit” at the District level would combine community health veterinary data. This innovative strategy would involve the communities for the early detection of cases and build trust (FAO, 2011; WHO, 2007). There is a need for such an innovative pilot project that would involve communities, develop strategies for early disease detection, and mitigate economic losses. The proposed pilot project would enhance early detection of H5N1 in Kaski District in rural Nepal to prevent human contamination through the creation of a human-veterinary health Unit and through community engagement to mitigate the economic losses of preventive measures targeting livestock. Kaski District would be an interesting site for the experimental pilot project, as the District was hit by the 2013 H5N1 epidemic. More than 4 outbreaks occurred in 2013 resulting in more than 2048 deaths of birds[14]. Kaski District is divided into 43 Village Development Committees (VDCs) and each of the VDCs is divided into 9 wards. Five (Village Development Committees, VDCs) would be chosen randomly to implement community level surveillance sampling activities. At the end of the project, the number of cases detected in experimental VDCs would be compared with 5 other randomly chosen control VDCs. The overall objective would be to detect animal and human cases before the epidemic stage. Specific objectives would include:

- To test the efficiency of a functional District level “One Health surveillance Unit” able to detect, sample and map animal and human cases.
- To measure the effect on early detection of a community “One Health” community network in 45 wards with community members engaged in early detection and economic loss mitigation measures (focusing on information on legal measures and advocacy).

The activities to reach those objectives would include:

- The training of District Health Office (DHO) District Veterinary Office (DVO) rapid response teams for joint field investigations including both the specific training on rapid diagnoses methods and the provision of adequate material.
- The constitution of a “District One Health Surveillance Unit” able to use electronic mapping tools and analyze the data properly.
• The training of existing community workers of both health and veterinary sections in the 5 selected VDCs able to execute field samples correctly and investigate cases in close collaboration with community members.
• The constitution and training of 9 “Ward One Health Committees” per VDC (45 in total for 5 VDCs) to be activated for early detection, community sensitization and community economic loss mitigation plans.

New tools to be developed would include (1) Community sampling reporting model for the “Ward Committees” working in close collaboration with community health veterinary workers; (2) District level electronic surveillance and mapping tool to compile and analyze the data.

The budget would include community activities in 45 wards (9 wards x 5 VDCs) to constitute “One Health Committees” with training sessions for Committee members (on detection of H5N1 sick livestock or humans, community reporting scheme, legal provision for compensation) and the establishment of a community solidarity plan to mitigate economic losses linked to preventative measures. At District level, DHO and DVO rapid response teams would be trained on surveillance, sampling and reporting through a “One Health Unit” within the DHO. Four members would be trained on electronic monitoring and surveillance and provided with adequate material and programs. Existing Community workers from both the Ministry of Health and Livestock would be trained on the basic signs and symptoms of Avian Influenza (including precautionary prevention measure) and would be provided with cell phone and bicycles for real-time surveillance. The budget would also include technical support from both national and international specialized staff. Monitoring costs would include an initial assessment of routine indicators, baseline endline community survey and an end of project review. The project would generate essential data such as:

- Outcome data including the number of community reported suspected/confirmed animal cases human cases detected.
- Output data would include the presence of a functional District level One Health Unit able to map cases electronically; the number of joint interventions between District Health Office (DHO) and (District Veterinary Office, DVO) rapid response teams; the presence of trained community “One Health Committees” at ward level; the number of samples sent to Kathmandu for confirmation; the number of community mitigation activities undertaken to lessen the economic impact of interventions.
If proven successful the pilot project will be further developed in the entire District of Kaski district and in 4 other Districts in Nepal estimated to be at risk of H5N1 including Kathmandu, Rupendehi, Chitwan and Bhaktapur. Moreover, the project could contribute to enhance knowledge and control measures for other Zoonotic diseases of Public Health importance. There is a need for global cooperation, transparent communication, and collaboration between human health and animal health professionals to support One Health efforts.

References


OIE (21.01.2013): Information received on 21/01/2013 from Dr Nar Bahadur Rajwar, Director General, Department of Livestock Services, Department of Livestock Services, Lalitpur, Nepal. www.oie.int/(Cited on 12 December 2014)


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