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Late Dr. Durga Datt Joshi, Founder of NZFHRC

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Zoonoses and Food Hygiene News, published four times a year, provides a medium for disseminating technical information on matters related to zoonoses and food hygiene generated in the world, particularly in Nepal. The editors welcome submissions on these topics with appropriate illustrations and references. The views and opinions expressed in the News are those of the authors.

CONTENTS:

Collaborative Investigation Project (CIP) Facilitation: Nepal

National Zoonoses and Food Hygiene Research Centre (NZFHRC) has participated as contractor in a negotiated procedure based on a single tender and is currently contracted by Massey University to provide services for One Health Epidemiology Fellowship program Coordination in Nepal (contract EC331217/04/2014 and incorporated statement of work-SOW-EC331217-04-2014-NZFHRC).These terms of reference specify additional services to be provided in relation to component of the one health epidemiology fellowship program.

The field study is a part of the applied epidemiology research component. This study is to be known as Collaborative Investigation Project (CIPs). The applied epidemiology research Component including the CIPs has been conducted by the fellowship participants under the joint supervision of Massey University and NZFHRC. This component is running in parallel and interface with the Master's Degree education to strengthen the fellowship participants' knowledge and skills by practical application of the concepts taught to in country problems, including current situation assessment, gap analysis, design and implementation of CIPs and evaluation of disease control strategies for zoonotic diseases using one health approach. Both the CIPs and the broader applied epidemiology research components of fellowship program will also provide opportunities for participants to engage with professionals working in the government health sectors to evaluate disease control option for priority zoonotic diseases.

Collaborative Investigation Projects (CIPs) services related to: The title, objectives, intended outcomes of the CIPs to be delivered under the contract are:

CIP 1: Brucellosis

Title: Characterization of the movement and contact patterns that may be associated with *Brucella abortus* transmission amongst large ruminants in the three major ecozones of Nepal using social network analysis.

Objectives

1. Characterise the movement and contact patterns of cattle, buffalo and yaks that could be associated with the spread of *Brucella abortus* in the three ecozones of Nepal using social network analysis.
2. Summarise the patterns arising from the social network analysis in a way that can inform the parameterization of a spatially explicit stochastic model for *Brucella abortus* in large ruminants and people in Nepal, developed in Handi spread

Intended outcomes

1. Improved understanding of the movement and contact patters that may be associated with disease transmission among large ruminants in the 3 major ecozones of Nepal.
2. Improved accuracy of parameterisation of brucella abortus transmission in the model developed in the Handi spread

CIP 2: Japanese encephalitis

Title: Risk based modelling of Japanese encephalitis (JE) amongst people in Nepal prior to the implementation of the vaccination programmes.

Objectives

1. Create a risk map that accurately represents the spatial distribution of Japanese encephalitis in Nepal using tools in Handi Response and Quantum GIS

Intended Outcomes

1. Identify the weighted combination of environment and climatic factors that most accurately predict the spatio-temporal distribution of Japanese encephalitis in people in the absence of vaccination in Nepal.
2. A risk map for Japanese encephalitis in people, developed in Handi response that can be used in the Japanese encephalitis in Handi spread.

Overview of trainings/workshops

Data base design and management, GIS and Network analysis workshops are the main components of CIPs. The four training workshops have been conducted by National Zoonoses and Food Hygiene Research Centre (NZFHRC) and Agriculture and Forestry University (AFU) Rampur, Chitwan Nepal in collaboration with Massey University, New Zealand. The overviews of the workshops are given below:

A newsletter published by National Zoonoses and Food Hygiene Research Centre (NZFHRC)
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Database design and Management using Epi Info training workshop

Epi Info™ is taught at many schools of public health around the world. This includes five core modules: Make View, Enter, Analysis, Epi Map, and Epi Report. Each module can be used individually or in coordination with the Menu module to create a robust, flexible, and scalable public health informatics solution. The three days training work shop on Database Design and management using Epi Info was held from 31th March to 2th April, 2016 at Grand Hotel Tahachal Kathmandu, Nepal. A total 20 participants were present in the training workshop including six one health fellows. Dr. Sithar Dorjee, Regional Coordinator of South Asia One Health Programm, International Development group of Massey University, New Zealand was a facilitator. The main objectives of the workshop were:

- Learn how to design electronic database questionnaires
- Learn different features of Epi info for database design and management
- Set up database for CIPs in Epi Info (for one health fellows)
- Learn how to enter and process for data analysis

Modus operandi was presentation/lecture combined with hands-on demo, practical exercises –doing real thing using own questionnaires or example questionnaire, interactive discussions –share learning experiences, queries and troubleshooting-tips and best practices-smarter way and better way of designing database

Training workshop on GIS and Spatial Data Analysis

Infectious diseases are emerging/re-emerging in developing countries like Nepal. Preventive measures; diagnosis and treatment are not only key components to control it. For controlling and eliminating it, its distribution nature should be known. Geographical Information System (GIS) is used in epidemiology to identify disease cluster and risk factors associated with it. The four days training work shop on GIS and Spatial Analysis was held from 9th May to 12th May, 2016 at National Zoonoses and Food Hygiene Research Centre, Tahachal, Kathmandu, Nepal. A total 15 participants were present in the training workshop including six one health fellows. Dr. Tenzin Tenzin, Veterinary epidemiologist/Deputy chief officer, Disease Prevention and control Unit, National Centre for Animal Health, Bhutan was a facilitator. The main objectives of the workshop were:

The main objectives of the workshop were:

- Be able to use Open Source software to visualize and explore spatial epidemiological information (Quantum GIS, GeoDA, Satscan, Google Earth and GPS)
- To provide participants with knowledge and methods to collect, prepare, analyse, and describe spatial epidemiological information (Area data analysis, point data analysis and cluster data analysis)

Group photo of GIS and Spatial Data Analysis Training.

Modus operandi was presentation/lecture combined with hands-on demo, practical exercises doing real thing using example questionnaire.

Workshop on Descriptive Data Analysis Using Epi Info 7

The two days training workshop on descriptive data analysis using Epi Info 7 was organized from 29 to 30 May, 2016 at National Zoonoses and Food Hygiene Research Centre, Tahachal, Nepal. A total 19 participants were presented in the workshop. Dr. Sithar Dorjee, Regional Coordinator of South Asia One Health Programme, International Development group of Massey University, New Zealand was a facilitator. Dr. Dorjee delivered the combined lecturer with hands on demo practical exercise on advanced descriptive and inferential statistics.

Group photo of Descriptive data analysis workshop using Epi Info

Overview of Network Analysis Workshop

Network analysis is the process of investigating social structures through the use of network and graphtheories. It characterizes networked structures in terms of *nodes* (individual actors, people, or things within the network) and the *ties* or *edges* (relationships or interactions) that connect them. Examples of social structures commonly visualized through social network analysis include social media networks, friendship and acquaintance networks, collaboration graphs, kinship, disease transmission, and sexual relationships. That is, network analysis is a toolbox of methods for: exploring the topology of networks, identifying subgroups, characterizing the role of individuals, illustrating networks and statistical analysis of network data.

The four days training work shop on Network Analysis of Livestock Movement from 4-7 June 2016 at National Zoonoses and Food Hygiene Research Centre (NZFHRC) Tahachal, Kathmandu, Nepal. A total 18 participants were enrolled in the training workshop including six one health fellows. Dr. Sithar Dorjee, Regional Coordinator of South Asia One Health Programme, International Development group of Massey University, New Zealand was a facilitator. The main objectives of the workshop were:

- To train One Health fellows and officials of the collaborating agencies in network analysis techniques using UCINet6 and summarize results of CIP studies.
- Introduction to the concepts of networks and network analysis
- Understand different uses of network analysis in epidemiology - how networks affect disease spread dynamics and control measures.

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Group photo of Network analysis of livestock movements workshop

Sentinel potential of swine sero-survey using porcine JEV rapid test forecast for human Japanese encephalitis risk in Nepal

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Abstract

Introduction

Japanese encephalitis (JE) is the most important viral encephalitis in Nepal and Asia. It is a mosquito borne disease caused by a flavivirus that cycle between birds, pigs and people. Infected pigs develop a prolonged viremia and form a potential risk for JEV transmission to human population. For these reasons, monitoring of circulating Japanese encephalitis virus in porcine was detected to forecast human encephalitis risk in Nepal.

Methods

The study was conducted from August 2011 to June 2012 in four districts (Kathmandu, Morang, Rupandehi and Kapilvastu) of Nepal. A total 240 porcine serum was collected from Pig farms in pre-monsoon period (4 weeks before rainy seasons) and 184 human sera with AES (Acute Encephalitis Syndrome) were collected within four kilometer areas of pig farms during the rainy seasons. The collected sera were analyzed using rapid detection test (RDT) porcine encephalitis B virus antibody rapid test from All-biotech (China) for Porcine and IgM capture ELISA (Standard Diagnostic inc. South Korea) for human.

Results

Out of 240 pig test for JE, 98 (41%) were positive and 142 (59%) were negative. The highest positive was found in pigs of Kapilvastu district (71%) followed by Rupandehi district (67%), Morang district (18%) and Kathmandu district (13%). Of the 184 human serum tested for JEV infection by JEV IgM capture ELISA kit, 21(11%) were positive and 163 (89%) were negative. The positive JE cases were found to be higher in Kapilvastu 9 (26%), followed by Morang 3 (15%), Kathmandu 4 (11%) and Rupandehi 5 (5%).

Conclusion

The positivity rate of JEV infection in porcine seemed to be parallel with the positivity rate of human JEV infection. This finding reinforces the urgent need to conduct porcine sero survey for controlling human Japanese encephalitis risk in Nepal.

Key words: Porcine, Human, Japanese encephalitis, Nepal.

Epidemiology of echinococcosis in Nepal: A short communication

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Echinococcus granunosus is a zoonotic cestode that causes hydatid disease in man and animals. The parasite is worldwide distribution but endemic in central Asia, Europe, South America, and some countries of Africa. The range of intermediate host varies widely according to the strain of the parasite as well as geographical location (Tompson and McManus, 200). With the development of precise imaging techniques, the disease is better to understood in human and animals. The surveillance programmes have now provided more reliable data on the epidemiology of this disease.

The epidemiology of hydatid disease is unknown in Nepal due to the absence of disease surveillance and reporting system. Few researches have been carried out in urban areas of Kathmandu valley. According to Joshi *et. al* (1997a), the parasite cycles between dogs and pigs, in addition sheep, goats and buffalo cycles. In Nepal, three strains of *E granulosus*, namely; sheep strain, cattle strain and camel strain have been reported to occur in buffalo, sheep and human hosts (Tompson and McManus, 2002). For this study, published papers on echinococcus were reviewed in context of Nepal.

A preliminary study on echinococcosis in Kathmandu (Joshi, 1984) indicated that there had been 47 cases of echinococcosis amongst the 30,792 operations performed in the city's three hospitals between 1985 and 1990. Similarly, Joshi (1997a) conducted human sero prevalence in Kathmandu. ELISA of human serum sample collected randomly from residents of butchering area (n=347), red cross blood bank (n=227) and hospitals (n=230) revealed the overall prevalence to be 14.1% (n=804), with highest prevalence of 25% (n=192) among residents of one of the butchering area. Similarly, ELISA testing of serum samples of patients admitted to different hospitals of Kathmandu valley showed that the disease had slight higher prevalence among the males (53%, n=17), and considerably higher among the people of 35 or older age group (76%, n=17). The higher prevalence among males may be due to their greater contact with dogs while butchering. As seen usually, the predominant organ for cyst formation was liver (55%) followed by lungs (43%), kidney (2%) and other organs (1%). Coproantigen ELISA test of dog faeces also suggested high prevalence among dogs of the butchering areas of Kathmandu valley. Out of 88 dogs examined from livestock slaughtering areas, 5.7% were found to be positive, in contrast to 1.8% (n=173) positive dogs in non-slaughtering areas (Baronet *et al.,* 1994). Post-mortem examination of the dogs killed by the municipality revealed that the worm burden to be 1-5 worms per dog (Joshi *et al.,* 1997a). The examination of carcass of food animals in 17 slaughter houses of Kathmandu valley found hydatid cysts to be occurring in 5% buffalos (n=3065), 3% goats (n=1783), 8% sheep (n=150) and 7% pigs (n=143) (Joshi *et al.,* 1997a). Although the yaks are not brought for slaughter, an epidemiological study on them from 55 farms of different parts of the country by Joshi *et al.,* (1997b) found 31% of the animals infected with echinococcosis. Rangarao *et al*. (1994) has also mentioned hydatid cyst in Yaks of Sikkim region of India, a neighbouring province to Nepal. The variation of prevalence depends on geography, test procedures and different socio economic determinants. National wide extensive study is needed to understand the demand prevalence of this disease in Nepal

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NEWS:

Professional Engagement Programme:

- Dr. Paul Bingham, manager of surveillance and inclusion investigation team and Dr. Eve PleyDell, response manager, major incidents management team, News Zealand visited NZFHRC on May 17, 2016. They involved in professional engagement programme with one health fellows. They delivered lecture on New Zealand's biosecurity system- surveillance, investigation and response.

- Dr. Manish Kakkar, Public Health Foundation, India, was invited on 9 May, 2016 as zoonotic disease expert for the professional engagement programme. He delivered the lecture on one health practice-case of disciplinary research to address complex one health programme to one health fellows.

Ecohealth Network Meeting

Ms. Minu Sharma Program Coordinator of NZFHRC participated in the Ecohealth Network Meeting in Thailand during June 14-16, 2016. The Theme of the Meeting was **"Ecohealth Network is United to Fight Dengue on ASEAN Dengue Day".**

The objectives of the meeting are:

1. To unite and participate in the activities related to dengue vector control in order to celebrate the ASEAN Dengue Day in Thailand
2. To share country experience related to dengue research and control operation in each network country
3. To brainstorm on the way forward and potential opportunities for future collaborations among network countries

DDJ Research Award:

Please kindly submit your research work on zoonotic diseases for consideration of DDJ Research award for the year 2016 by the end of September 2016 to NZFHRC office Chagal, G.P.O. Box 1885, Kathmandu, Nepal, Phone: 4270667, 4274928 and Fax 4272694. This award was established by DDJ Research Foundation in 2071 B.S. (2014) in the memory of Founder of this Foundation, Late, Dr. D.D. Joshi. The award includes a grant of NCRs. 25,001/- (Rs. Twenty Five Thousand and One) with a certificate.

K.D.M.A. Research Award:

Please kindly submit your research work paper on allergy award for the year 2015 for the consideration by the end of September 2016 to KDMART office Chagal, G.P.O. Box 1885, Kathmandu, Nepal, Phone: 4270667, 4274928 and Fax 4272694. This award was established by Late Dr. Durga Datt Joshi in 2049 B.S. (1992) on the memory of his wife, the late Mrs. Kaushilya Devi Joshi. The award includes a grant of NCRs. 15,001/- *(Rs. Fifteen Thousand and One)* ***with certificate.***

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TO:

Dr/Mr/Ms .....

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