

Zoonoses and Food Hygiene News

Vol. 20 No. 3 July to September 2014

ISSN: 2091-0932 (Print), 2091-0940 (Online)

Government of Nepal, Registration Number: 148/049/050

This Issue has been Supported by International Development Research Centre (IDRC), Ottawa, Canada

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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.

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Assessment of JE knowledge and dissemination of awareness program among different stakeholders

Dhan Kumar Pant and Mahendra Maharjan, NZFHRC

ABSTRACT

Japanese encephalitis (JE) is a mosquito-borne zoonotic disease that has pigs as the major amplifying hosts. It is an important cause of viral encephalitis in Nepalese people and is spreading across various geographic areas. Major strategies for JE prevention and control include education, vector control, and immunization of people and pigs. Pig farming is increasing in Nepal with reducing cultural biases against pigs as a source of food along with government programs to support pig farming for poverty alleviation. A JE awareness program was conducted among the different stakeholder groups in four districts of Nepal. The target groups were paraveterinarians, pig farmers, non pig farmers and teachers. A JE dissemination program was conducted by using oral presentations as well as by distributing pamphlets, booklets and posters. Before this dissemination program, JE knowledge was assessed among the different stakeholder. All of the JTAs (100%) and 13(72%) non pig farmers had heard about JE, but only 7 (54%) of school teachers and 43.5% of pig farmers had heard about JE. Those stakeholders, who knew about JE, had heard it from the media. The media seemed to be effective source of information. None of the stakeholders we worked with had ever been vaccinated against JE, and none showed signs and symptoms of Japanese encephalitis infection.

In conclusion, the mass awareness program campaign needs to be disseminated among the different stakeholders. The school teachers and pig farmers may require a more targeted awareness campaigns, since many of them did not seem to know about JE.

INTRODUCTION

Japanese encephalitis (JE) is an important cause of viral encephalitis in Nepal and Asia (Umenai et.al, 1985 and Rayamajhi et. al, 2011). It is a mosquito borne disease caused by a flavivirus that cycle between birds, pigs and people (Vandenhurk et. al, 2009). Its distribution has expanded in recent years, and it is expected to spread more widely geographically with anticipated changes in climate, land use (particularly rice and pig farming, and urbanization), and access to health care (Erlanger et. al, 2009 and Lebeaud, 2008). The high case fatality rate, high rate of severe long lasting neurological symptoms and the majority of deaths occurring in children make JE a major public health problem. JE is not homogeneously distributed in Nepal. The disease was first confirmed in western Nepal in 1978 (Joshi,1983) in the lowland plains of Terai which borders India, and has regularly occurred since then with epidemic peaks every 2–5 years (Bista and Shrestha,2005). JE has now been documented in 54 of the 75 districts of Nepal, including 24 hill and mountain districts, and is considered to be endemic in the Kathmandu Valley as well as in 24 other districts (Bista and Shrestha, 2005; Pant, 2009 and Parajuli et.al, 1992).

The World Health Organization Regional Office for South-East Asia (SEARO/WHO) has pointed out four major strategies for JE prevention and control; health education, vector control, immunization of people and pigs, and epidemic preparedness and response (WHO,2002). Other countries like Japan, South Korea and Taiwan have successfully controlled JE through human and pig vaccination programs, modernization of pig farms, changes in agricultural practices and improved living standards (Erlanger et. al, 2009; Igarashi, 2002). The investments required to achieve these changes is beyond the current economic capacity of Nepal. Even human vaccination is not affordable or sustainable at the present time. Low-cost alternatives need to be found to begin to address the SEARO/WHO recommendations.

Pig farming is increasing in Nepal due to reduced cultural biases against pigs as a food source, and new government programs to support pig farming as a low cost means to create income for poverty alleviation and to improve food security. A 48% increase in the Nepal pig population in 14 years (MOAD, 2012) shows how fast this industry is growing. Pig farms are not homogeneously distributed in Nepal. Pig farming is most prevalent in the eastern and central regions of the country where the pig-raising ethnic communities predominate. Pig farming is also common in peri urban areas because of an increased demand for pork in urban areas. Because pigs are a major JE virus amplifying hosts (Solomon et.al,2000) ensuring pig farmers are aware of and able to use means for personal and community risk reduction should be an important part of a Nepalese JE prevention strategy. A previous study in the four districts of Nepal (Dhakal et al., 2012) found that Exposure to JE risk factors was common across pig farms and pig farming districts but there were significant district level differences in knowledge and practices related to on-farm JE risk reduction. Social factors such as literacy, gender, and cultural practices were associated with farmer attitudes, knowledge and practices for JE control. JE vaccine uptake was almost non-existent and mosquito control steps were inconsistently applied across all 4 districts. Income was not a determining factor for these differences, but all farmers were very poor and well below the national average income of 202,374NRS per year. The low uptake of

vaccine and lack of infrastructure or financial capacity to house pigs indoors or away from people suggest that farmer personal protection should be a priority target for education in Nepal. Based on these findings, our objective was to disseminate the awareness program among the different stake holders to promote their knowledge regarding Japanese encephalitis.

METHODS

A JE awareness program was conducted among the different stakeholder groups in four districts of Nepal namely Kathmandu, Morang, Rupandehi and Kapilvastu from January to April 2014. Target groups were paraveterinarian, teachers, pig farmers, non pig farmers and students.

Before disseminating the JE awareness program, semi structured questionnaires were administered among the different stakeholders, followed by oral presentation and distribution of the mandala poster, pamphlets and audio-visual programs.

RESULT

A total 38 Para - veterinarians were enrolled in the study. Fourteen (37%) were enrolled from Rupandehi, 14 (37%) from Kapilvastu and 10 (26%) from Morang. For gender wise distribution, 37(97%) were male and 1(3%) was female (Table No 1).

Table No.1: Enrolment of participants from three districts

Districts	Frequency
Rupandehi	14 (37)*
Kapilvastu	14 (37)
Morang	10 (26)
Total	38 (100)

*parenthesis indicates percentage

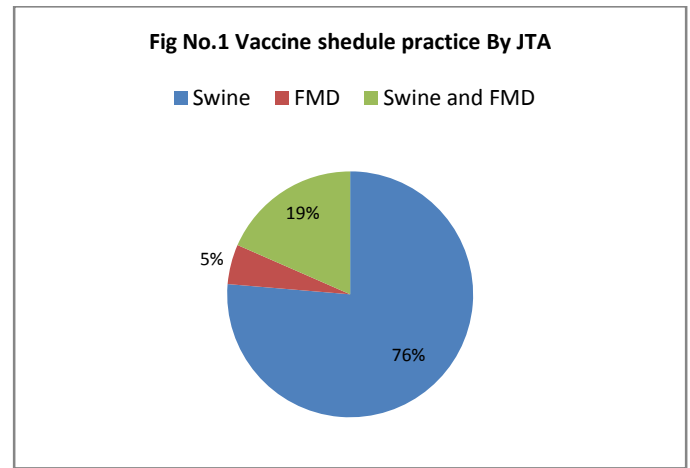
For the assessment knowledge of JTA and their practice, different parameters were administered. Out of 38 respondents, all para-vets had heard about zoonotic diseases and JE. Thirty six (95%) Para-vets had bio security knowledge and pig farm had visited pig farms when they were informed. Only one (3%) pig farmer had taken training on pig husbandry and 8(21%) had pigs in their farms. Only 27 (71%) para-vets adopted safety precautions such as wearing gloves and mask. Twenty eight Para-vets had experience with large animal farms (e.g. cattle) and 24 (63%) had experience with poultry (Table No. 2).

Table No.2 Assessment of Knowledge of JTA with different parameters (n=38)

Parameters	Response	
	Yes	No
Have you heard about zoonotic disease?	38(100)*	0(0)
Do pig farmers inform you when pig sick?	36(95)	2(5)
Have you taken any training about pig husbandry?	1(3)	37(97)
Have you heard about JE?	38(100)	0(0)
Do you know about bio-security?	36(95)	2(5)
Do you have your own pig farm?	8(21)	30(79)
Do you visit poultry farm?	24(63)	14(27)
Do you visit at large animal?	28(74)	10(26)
Do you take any safety method?	27(71)	11(29)

*parenthesis indicates percent

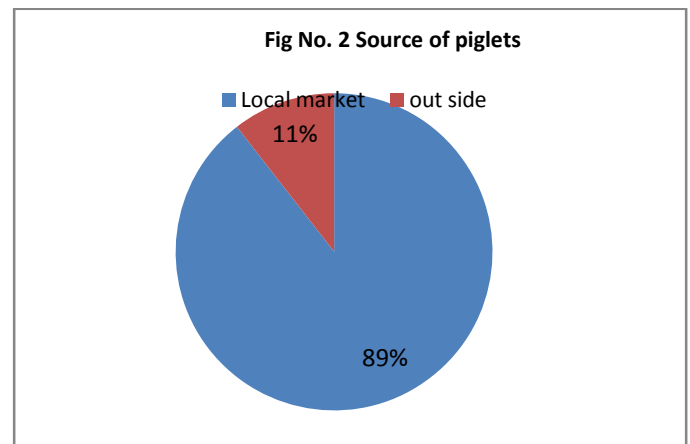
Sixty three percent of Para-vets responded that the majority of pig farmers consulted with them in the rainy seasons on regular basis. They said that pigs become sick more frequently than other seasons. Most JTA responded that they vaccinated pigs against swine flu (76%), compared against 5% that said they vaccinated against FMD and 19% that vaccinated against both FMD and Swine flu (Fig No.1).

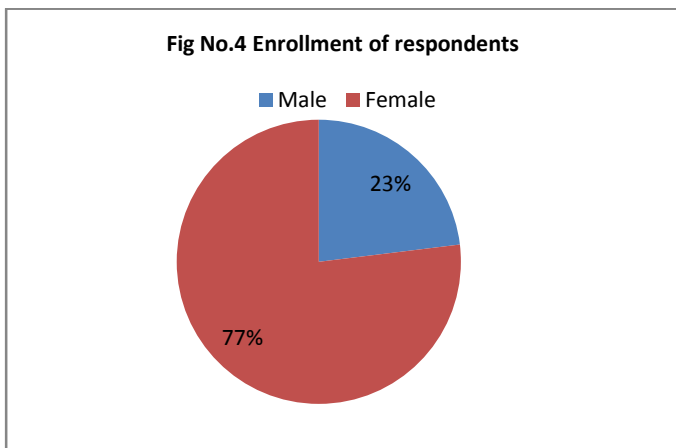
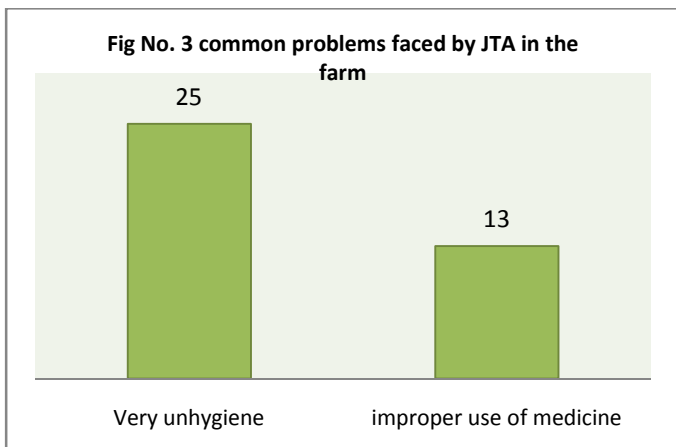


Based on JTAs' experience, 31 respondents said that exotic breeds were more susceptible to diarrhea and swine fever and 22(58%) JTA responded that only few farmers had adopted bio-security measure the farm level. Eighty four percent JTA responded that they purchased their vaccines from the agricultural veterinarian and 74% of JTA responded that they were satisfied with their profession.

Sixty eight percent of Para-vets responded that sometimes they disseminated zoonotic awareness programs among the pig farmers; 21% delivered only on request and 11% of respondents delivered awareness programs at every visit. For consulting veterinarians, 66% JTA responded that they regularly consulted with veterinarians and 24% responded that they only sometimes consulted with veterinarians.

For the source of piglets, 89% JTAs responded that farmers purchased piglets from the local market and 11%JTAs responded that piglets were purchased from outside district. Based on JTA experience, 63% JTA responded that major quantities of meat was sold to local market, with Kathmandu valley also receiving a large amount of pork product and 37% responded that Kathmandu was also marketing channel. Twenty five (25/38) JTA responded that a common problem they encountered was unhygienic pig farm conditions (Fig. No 2 and 3).





A total 13 school teachers were enrolled in the study, of which, 23% were male and 77% were female (Fig. No 4). For the assessment of JE knowledge and disease transmission modes, semi-structured questionnaires were administered. Out of 13 respondents, 7(54%) had heard about JE and preventive measures. Four respondents had previously participated in an awareness program none had been vaccinated for JE. Of the 7 respondents who had heard of JE, 57% had heard about it from the media and 43% had heard about it from academic study.

Twenty-three pig farmers were enrolled from the study areas, of which 18(78.3) were male and 5(21.7) were female. For the education level of the respondents, 2(8.7%) farmers were illiterate, 12(52.2%) were below SLC (School Leaving Certificate) and 9(39.1) were above SLC. Sixty five percent of pig farmers had mud type house compared to concrete houses (34% of respondents). Eleven (47.8%) farmers had built their houses more than 100m from the pig farm and 4 (17.4%) of the farmer's had houses less than 50m from the pig farm. Five farmers had more than five years experience in pig farming and 18(65.2%) had less than 5 years. Semi-structure questionnaires were administered to assess JE knowledge. Out of 23 respondents, 10(43.5%) had heard about JE and other vector borne disease, of which 5(50%) had heard about JE from the media. At least 10% of respondents had heard about JE from their doctor or other research institute. Three respondents had knowledge of mode of transmission of JE and vaccine campaign as well launched by government. No one had taken JE vaccination against JE but 4 respondents had immunized their children against JE disease. Fifty two percent of pig farmers had small pig farm, 26% had medium sized farms and 22% of farmers had a large pig farming system. Seventy-eight percent of 78% farmers raised mixed swine breeds. For the pig farming system, 69% pig farmers were motivated by themselves to start farming, 22% had been continuing their tradition

and 9% farmers were motivated by Shilichung Pig farming groups. Shilichung is Nepal pig professional association organization which provides training on pig farming. But 78% pig farmers turned over pigs below 8 month and 78% consulted with Veterinarian.

A total of 18 non-pig farmers, neighbors of pig farmers, were enrolled in this study, of which 3(16.71%) were male and 15(83.3%) were female. Out of 18 respondents, 13 lived in concrete houses & 5 lived in mud houses. Fourteen (77.8%) respondents were below SLC and 4(22.2%) were above a high school education level. In terms of occupation, 11(61.1%) held private jobs (shop, hotel tailoring etc) 1(5.6) had government jobs and 6(33.3%) had other type of jobs such as tailoring, hotels etc. For the assessment of knowledge about avoiding mosquitoes and preventing JE, 13(72%) non pig farmers responded that they had heard about JE and other vector borne disease. All of the respondents, who had knowledge about JE also knew about the mode of JE transmission cycle. None of the respondents were vaccinated against JE but all of them took measures such as mosquitos' bed net or repellent to avoid mosquitoes bites.

Dissemination of JE knowledge among the different stakeholders

From the assessment of JE knowledge among the different stakeholders who participated in this questionnaire, all of the JTA (100%) and 13(72%) of the non pig farmers had heard about JE but only 54% of the school teachers and 43.5% of pig farmers had heard about JE. The knowledge of Japanese Encephalitis and its mode of transmission among the different stakeholders seemed to be inadequate. To promote increasing their knowledge, an awareness programme was conducted in all four project districts. The major tools used in the awareness programs were oral presentations, mandala poster, pamphlets and audio-visual programs. The oral presentation was delivered by medical doctors, public health experts, veterinarians and entomologists. The case study of patient and pathogenesis were delivered by audio-visual methods. The JE cycle, risk factors and preventive measure were described using the mandala poster. Finally, mandala posters and pamphlets were disseminated to participants and they were requested to distribute these materials to their local community/organizations. Further dissemination programs were conducted through television, local newspapers and FM radio.

DISCUSSION

A five year retrospective data review showed that there were 157 human cases of JE in Kathmandu, 89 cases in Morang and 16 cases in Rupandehi district. Two years' worth of research findings also indicated that JE risk factors were common across farms and farmer families in all four districts but there were district differences in knowledge and practice related to farm JE risk reduction (Dhakal et al., 2014). A previous survey in Nepal identified three JE control priorities: I) informative education and communication strengthening to increase awareness of individual and communities; II) behavioral changes to increase prevention and practice and III) environmental intervention to reduce the risk factors (Houston and Chhetry 2003). The study conducted on the regional variation of JE knowledge in the four district of Nepal showed that Kapilvastu district lagged behind in all three of these priority areas followed by the Morang district. Farmers in the Kapilvastu not only had the lowest level of awareness of JE, but also had the lowest proportion of farmers who were I) had the lowest proportion of literate farmers, II) had more than 3 years pig farming experience III) had higher income, IV) knew that people could acquire disease from pigs and V) used methods for mosquitoes bite avoidance. In all regions, where farmers had higher level of literacy (Kathmandu 61% and Rupandehi 77%) there was also a higher rate of JE awareness than in those districts with lower farmer literacy rates (Morang 45% and Kapilvastu 22%). Based on these findings, the JE dissemination programme was conducted among the different stakeholders (JTA, school teachers, pig farmers and non pig

farmers). All of the JTA (100%) and 13(72%) non pig farmers had heard about JE knowledge But 54% School teacher and 43.5% pig farmers had heard about JE. The stakeholders, who knew about JE, had heard it from media. The media seemed to be common source of information. None of the stakeholders were vaccinated against JE and had no signs and symptoms consistent with JE. Mosquito control would seem a critical target for Nepal not only due to inconsistent use of control measure found in the study but also due to the presence of multiple vector borne diseases in Nepal such as malaria and dengue fever. Community based educational intervention have been shown elsewhere to affect understanding and involvement in mosquito control and vector bone disease prevention. Programme targeting mosquito control has resulted in declines in JE elsewhere. For example, in Assam, India, a sharp reduction in JE sero-conversion rate in people and pigs was achieved when insecticide treated nets were used to prevent mosquito bites in both people and pigs (Dutta et.al, 2011). Similarly, a population based case control study in China found that the use of insecticide treated nets was associated with significant reductions in JE cases.

The mass awareness programme campaign needs to be disseminated among the different stakeholders to attack the root cause of people's personal disease prevention behaviors.

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NEWS

Dr. Ajit Kumar Karna, PhD fellow of Colorado State University, USA is doing research entitled "**Comprehensive understanding of ecology and epidemiology of Japanese encephalitis virus in Nepal**" in this institute at NZFHRC.

K.D.M.A. Research Award:

Please kindly submit your research work paper on allergy award for the year 2014 for the consideration by the end of December 2014 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. 10,001 with certificate.

**From: Zoonoses & Food Hygiene News, NZFHRC
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TO:

Dr/Mr/Ms

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