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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:

Impact Assessment and Control of Cysticercosis in the Indian Subcontinent

Continue from previous issue of Vol 13 No. 2 April – June 2007

(1) Intermediate results related to RESEARCH:

Intermediate results 1: **Studies on epilepsy and the involvement of cysticercosis are conducted.**

This study will mainly address the burden of disease caused by cysticercosis.

IR number 1	**Epilepsy and cysticercosis**	**Start date: Month 0**	**Completion date: Month 24**

Objectives

1. Determine whether and how much epilepsy is associated with neurocysticercosis.

Description of work

Task 1. (UGent, CMC, NZFHRC) Develop research protocols and submit for ethical clearance to the respective ethics committees.
Task 2. (CMC) Community-based epilepsy study: *To assess the comparative prevalence of active epilepsy (AE) in pig rearing and non-pig rearing communities in Vellore district from the data available from the ICMR study. Assess the socio-economic impact of epilepsy in the pig rearing communities using standard protocols.*
Task 3. (NZFHRC) *Hospital-based epilepsy study:* Select 200 patients with active epilepsy that presented at hospitals in Kathmandu (N=200). Select the same number of age and sex-matched healthy individuals.
Task 4. (CMC, NZFHRC) The epilepsy patients identified in the studies in Kathmandu will be subjected to clinical examinations, serological diagnosis (Ab- and Ag-tests for cysticercosis) following blood sampling, stool examination (formalin-ether method, copro-antigen) and contrast computed tomography diagnosis in hospitals. The neurologists will decide on whether and what kind of treatment will be proposed to the patients. Only serological diagnosis (Ab- and Ag-tests for cysticercosis) following blood sampling will be done on healthy individuals. The serological and stool samples collected in the ICMR study (CMC) will be subjected to Ag-ELISA and coproantigen analysis, respectively.
Task 5. (CMC, NZFHRC) Analyse results and prepare reports.

Milestones and expected results

M1. Association between epilepsy and neurocysticercosis determined in Vellore district in Tamil Nadu (India) and the Kathmandu valley (Nepal). Determine differences in the prevalence of AE in pig rearing and non-pig rearing communities in Vellore district.

M2. Value of antibody and antigen determination in diagnosis of NCC assessed.

Intermediate results 2: Prevalence studies of taeniasis/cysticercosis in humans and of cysticercosis in pigs are conducted in pig-keeping and non-pig-keeping communities.

IR number 2	**Prevalence studies**	**Start date: Month 0**	**Completion date: Month 24**

Objectives

1. To determine the prevalence of *Taenia solium* in humans (taeniasis and cysticercosis) and pigs (cysticercosis).
2. To study risk factors of taeniasis/cysticercosis, in particular pig rearing.

Description of work

Task 1. (UGent, CMC, NZFHRC) Develop research protocols and submit for ethical clearance to the respective ethics committees.
Task 2. (CMC) Organise tongue palpation and blood sampling of 400 pigs in the Vellore district catchment area.
Task 3. (NZFHRC) Organise randomised blood sampling of 400 pigs in the peri-urban area of Kathmandu.
Task 4. (CMC, NZFHRC) Analyse the samples: human blood samples: EITB taeniasis, EITB, Ab-ELISA and Ag-ELISA for cysticercosis; human faecal samples: formalin-ether method, copro-antigen test; pig blood samples: Ab-ELISA, Ag-ELISA for cysticercosis.
Task 5. (CMC) Enter the results in the existing GIS databank of Vellore district (Community Health department).
Task 6. (CMC, ITM) Treat *Taenia* carriers using a standard protocol, collect the worms expelled and identify them by morphology and PCR-RFLP.
Task 7. (CMC, NZFHRC) Analyse results and prepare reports.

Milestones and expected results

M1. Burden of infection of taeniasis and cysticercosis in humans and cysticercosis in pigs determined in a large district in India.
M2. Prevalence of cysticercosis in pigs determined in the peri-urban area of Kathmandu.
M3. Risk for human cysticercosis in communities where pigs are reared versus communities where no pigs are reared determined.

Intermediate results 3: Transmission studies in selected areas.

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IR number 3	**Transmission studies**	**Start date: Month 0**	**Completion date: Month 24**

Objectives
1. To determine whether the transmission of cysticercosis follows a clustered pattern.
2. To study the burden of infection in the family and village clusters of tapeworm carriers.
Description of work
Task 1. (UGent, CMC) Develop research protocols and submit for ethical clearance to the respective ethics committees. Task 2. (CMC) Identify 15 Taenia carriers in different pig rearing communities in Vellore district. Conduct a door-to-door survey of 500 people living in the vicinity of each taenia carrier (15 x 500 = 7500 population) to determine prevalence of active epilepsy (A.E.) in these communities. Task 3. (CMC) Organise blood sampling of the tapeworm carriers and blood and stool sampling of their families and of 800 individuals (living at varied distance from the carriers) in their villages. Georeference the sampling places. Task 4. (CMC) Analyse the samples: human blood samples: EITB, Ab-ELISA and Ag-ELISA for cysticercosis. Task 5. (CMC) Make GIS maps. Task 6. (CMC) Patients with AE will be offered a neurological examination and a contrast CT scan examination. Task 7. (CMC) Analyse results and prepare reports.
Milestones and expected results
M1. Determine the transmission pattern of Taeniasis/cysticercosis, whether clustering is observed or not.

Intermediate results 4: Appropriate control programmes are designed, and implemented and monitored in selected areas in India.

IR number 4	**Pilot control programmes**	**Start date: Month 24**	**Completion date: Month 48**

Objectives
1. To design control programmes based on results of IR 1,2 &3 and on socio-economic situation
2. To implement interventions in selected areas
3. To monitor the efficacy of the interventions during two years
Description of work
Task 1. (UGent, CMC) Select areas where intervention studies will be implemented. Task 2 (CMC) Conduct socio-economic analysis (sanitation, pig rearing,…) in the study areas. Task 3. (UGent, CMC) Design control protocols that are most appropriate based on results of IR 1,2 & 3 (e.g. health education, mass treatment for human taeniasis, treatment of pigs, …) and Task2 of IR4 and submit for ethical clearance to the respective ethics committees. Task 4. (CMC) Organise blood sampling in pigs in the study areas. Task 5. (CMC) Implement interventions in the study areas. Task 6. (CMC) Monitor the efficacy of the interventions in the selected areas: randomized blood and faecal sampling in humans and blood sampling in pigs after 12 and 24 months. Task 7. (CMC) Analyse the samples: human blood samples: EITB cysticercosis, EITB taeniasis, Ab-ELISA, Ag-ELISA; human faecal samples: formalin-ether method, copro-antigen; pig blood samples: Ab-ELISA, Ag-ELISA. Evaluate the situation, continue or adjust intervention strategy accordingly. Task 8. (CMC) Analyse results and prepare reports.
Milestones and expected results
M1. The efficacy of the intervention strategies is studied.

(2) Intermediate results related to CAPACITY BUILDING (if not applicable please delete):

Intermediate results 5: South-south collaboration between India and Nepal is established.

Describe the main activities

IR number 5	**South-south collaboration**	**Start date: Month 0**	**Completion date: 48 months**

Objectives
1. To establish a sustainable collaboration on research and training between the research groups in CMC Vellore and NZFHRC in Kathmandu.
Description of work
Task 1. (CMC, NZFHRC) Training of NZFHRC staff at CMC on laboratory diagnosis and community health. Task 2. (CMC, NZFHRC) Exchange results generated by the project. Task 3. (CMC, NZFHRC, UGent) Organise a joint workshop at the end of the project to discuss the results, formulate recommendations. Task 4. Establish a basis for further collaboration and fund raising on zoonotic diseases.
Milestones and expected results
M1. A sustainable collaboration on research on zoonotic diseases, in particular cysticercosis is established between CMC Vellore and NZFHRC Kathmandu, creating a network of centres of excellence in South India.

Intermediate results 6: Laboratory tests are operational and personnel are trained for these.

IR number 6	**Technology transfer & training**	**Start date: Month 0**	**Completion date: 12months**

Objectives
1. To make laboratories in both institutes fully operational for parasitological and serological testing.
2. To make highly sensitive and specific laboratory tests available for diagnosis of taeniasis and cysticercosis for both partners.
3. To train laboratory personnel on these immunodiagnostic techniques.
Description of work
Task 1. (UGent, CMC) Transfer of the Ag-ELISA (test developed at ITM) to CMC. Task 2. (UGent, CMC) Develop the EITB for taeniasis, developed at CDC, Atlanta, in the laboratory in CMC. Task 3. (UGent, CMC, NZFHRC) Transfer all diagnostic tools to be used to NZFHRC. Task 4. (UGent, CMC, NZFHRC) Training of NZFHRC laboratory technicians in Ag-ELISA (ITM), Ab-ELISA and immunoblot (CMC)
Milestones and expected results
M1. Laboratories in CMC and NZFHRC can perform immunodiagnosis for taeniasis and cysticercosis.

Intermediate results 7: Post-graduate students are trained.

IR number 7	**Post-graduate training**	**Start date: Month 0**	**Completion date: 48 months**

Objectives
1. To train a PhD student on diagnosis of taeniasis at CMC.
2. To train a PhD student on diagnosis of cysticercosis at CMC.

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3. To train a PhD student (veterinary medicine) on epidemiology and prevention of cysticercosis in pigs at CMC.

4.To train a Phd student on taeniasis/cysticercosis in Kathmandu. ***PhD and sociology by Ms. Minu Sharma who is working as a sociologist and programme officer in this centre. She will be registered as a PhD student in Tribhuvan University Kathmandu or Belgium University (Prof. Dorny's place). Second person as PhD candidate Dr. D.R. Ratala, Parasitologist, Consultant at present in our centre. He will be registered on Taeniasis subject for his thesis work.***

Description of work

Task 1 (CMC, NZFHRC) Selection of students and training in relevant research methods. (See IR No 6)
Task 2 (CMC) PhD student taeniasis, research plan:
a. Raise and purify *T solium* antibodies suitable for copro-antigen immunoassays. b. Examine all fecal samples for coproantigens by immunoassays and microscopy. c. Analyze data and map taeniasis cases. d. Purify antigenic *T solium* proteins of coproantigen capture assays and characterize their strucutural requirements for immunogenicity. e. Submit and defend thesis.
Task 3 (CMC) PhD student cysticercosis, research plan:
a. Assay samples and analyse data for levels of exposure and of cysticercosis infection in community and porcine population. b. Map positive porcine and human cysticercosis cases. c. Characterize chemical structures (eg carbohydrate side chains) of *T solium* diagnostic antigens required for antibody binding. d. Submit and defend thesis.
Task 4 (CMC) PhD veterinary student porcine cysticercosis, research plan:
a. Validate techniques to detect cysticercosis in pigs in India. b. Study prevalence of porcine cysticercosis in the study area. c. Conduct socio-economic study of pig rearing in the communities. d. Design, implement and monitor control programmes for porcine cysticercosis. d. Submit and defend thesis.
Task 5 (NZFHRC) Phd student on taeniasis/cysticercosis, research plan: a. Conduct hospital-based study on impact of cysticercosis on epilepsy (ref. IR1). b. Conduct socio-economic study of pig rearing in the communities. c. Submit and defend thesis. ***PhD candidate Ms. Minu Sharma will be conducting socio economic status study of pig rearing farmers in the communities of the project area and will submit her thesis to the University. M.V.S. candidate Dr. Krishna Raj Pandey will study on Taeniasis/Cysticercosis epidemiological research on medical hospital based human cases diagnoses and economic status with disease control and mass awareness thesis will be presented to the board of university through our project.***

Milestones and expected results

M1. Students exposed and trained in local health problem.
M2. Understanding of the dynamics of *T solium* transmission in the community
M3. Understanding of *T solium* protein structures that contribute to host response in taeniasis and cystcercosis
M4. Bank (at -70^{o}C) of human sera / fecal samples from community (pig-rearing, non-pig rearing) and porcine sera from same area.
M5. Understanding of the socio-economic role of pig rearing in the communities and the impact of cysticercosis on this.

(3) Intermediate results related to EXTENSION:
Intermediate results 8: Recommendations for control are formulated and disseminated.

IR number 8	**Formulation & dissemination of recommendations**	**Start date: Month 25**	**Completion date: 48 months**

Objectives

1. To formulate recommendation based on the results of the field surveys (IR 1-4) and to disseminate these to the stakeholders.

Description of work

Task 1. (UGent, CMC, NZFHRC) Make meta-analysis of all results generated by the project.
Task 2. (CMC, NZFHRC) Organise local workshops in Vellore and Kathmandu with the stakeholders to disseminate recommendations.
Task 3. (CMC, NZFHRC) Design poster and leaflets on prevention of taeniasis/cysticercosis.
Task4. (UGent, CMC, NZFHRC) Organise end-of-project workshop at NZFHRC.
Task 5. (CMC, NZFHRC) Defend PhD theses.
Task 6. (UGent, CMC, NZFHRC) Publish results in scientific papers and present results at conferences.

Milestones and expected results

M1. First recommendations formulated on prevention of cysticercosis in India and Nepal based on community-based studies.
M2. Design for poster/leaflets presented
M3. PhD theses defended
M4. Papers published in national and international scientific journals; results presented at national and international conferences

URBAN ECOSYSTEM HEALTH PROJECT - KATHMANDU
(Phase - III) July 2007 to June 2009

The project has been agreed and signed by both parities that is NZFHRC and IDRC to start this project from August 2007.

Justification

- The present government is in preparation to announce the date for election, after the election the local government will nominate 8 representatives from all the political parties since there is a coalition and interim government.
- When Urban Eco-system II project was phased out, at that time due to political instability and conflict, lack of high ranking government official at KMC it was not possible to implement all the planned work developed by the stakeholders in ward 19 and 20 of KMC.
- After the Election and selected Representatives from government, they will formulate the new constitution and it might take longer to know the project, hence it is a good idea to run the project for 2 years.
- If we run the Phase III, we can carry over most of plan activities developed by all the stakeholders, and then it will be fruitful.

General Objective

The overall objective of this phase III project is to strengthen a research to policy and action capacity of community stakeholders and authorities in Kathmandu Metropolitan city to put in place and expand sustainable processes of local development to improve community health, environmental quality and local economic development.

Specific Objectives:

1. Assess and document the project's influence on policies and local organization, and the impact and remaining challenges of these in project wards with respect to community health, environmental sustainability and local economic development.
2. Develop and implement a funding diversification strategy to support local stakeholder organizations and NZFHRC in community development initiatives that follow an urban ecosystem health approach.

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3. Build the organizational capacity and sustainability of local stakeholder organizations that were established in earlier project phases, with special attention to those from the more vulnerable groups, such as wage labourers, street vendors and women sweepers.
4. Monitor progress and follow-up actions of current work-plans from community stakeholder groups, and carry out a mapping of health, environment and community development outcomes of the project over its several project phases.
5. Reflect on and synthesize the conceptual and methodological approaches based on the project experience for wider sharing and dissemination.

Free Dog Rabies Vaccination in Mahendranagar Municipality of Kanchanpur District and Nepalgunj Municipality of Banke District

Ms. Minu Sharma and Dr. D. D. Joshi

Ward wise dog vaccinated result for Mahendranagar municipality and Nepalgunj municipality are given in table no. 1 and 2. This programme was implemented by Nepal Para-veterinary and Livestock Association (NEVLA), Nepal. This programme was supported by DURVAN, Tokyo, Japan, DDJ Research Foundation, Chagal, Kathmandu, Nepal.

Table No 1: Ward wise Dog Vaccination in Mahendranagar Municipality

Ward	Estimated dog population	Dogs vaccinated	
		Frequency	Percent
1	163	14	10
2	351	31	9
3	260	31	12
4	327	62	19
5	231	14	6
6	403	60	15
7	268	11	4
8	262	4	2
9	351	4	1
10	515	4	1
11	222	2	1
12	160	6	4
13	297	0	00
14	180	9	5
15	203	25	12
16	161	1	1
17	106	3	3
18	697	114	16
19	232	5	2
Total	5389	400	7.42

Table no. 2: Dog Population Vaccinated Against Rabies by Ward wise in Nepalgunj Municipality.

Ward no.	Estimated Dog Population	Dog vaccinated against rabies	Dog vaccinated in Percentage
1	388	47	12.11
2	216	55	25.46
3	138	9	6.52
4	119	13	10.92
5	435	72	16.55
6	262	28	10.68
7	228	28	12.28
8	17	11	64.70
9	114	10	8.77
10	156	12	7.69
11	146	14	9.58
12	247	37	14.97
13	404	115	28.46
14	196	8	4.08
15	124	6	4.83
16	298	24	8.05
17	184	55	29.89
Total	3835	544	14.18

NEWS:

Dr. Durga Datt Joshi, Executive Chairman and Dr. P. R. Bista, Vice-Chairman, NZFHRC participated to Belgium in the WAAVP conference in August 2007. Two flowing technical papers were presented at WAAVP Conference as an oral and poster presentation.

a. Prevalence of Porcine Cysticercosis and Human Taeniasis/ Cysticercosis in Nepal (Oral presentation)
b. Echinococcosis/Hydatidosis Prevalence in Animal and Human in Nepal (Poster presentation)

K.D.M.A. Research Award:

Please kindly submit your research work paper on allergy for trust award consideration by the end of May 2008 to KDMART office Chagal, G.P.O. Box 1885, Kathmandu, Nepal, Phone: 4270667 and Fax 4272694. This award was established by Dr. D.D. Joshi in 2049 B.S. on the memory of his wife, the late Mrs. Kaushilya Devi Joshi. The award includes a grant of NCRs. 10,001 with certificate.

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From: Zoonoses & Food Hygiene News, NZFHRC
P.O. Box 1885, Chagal, Kathmandu, Nepal.

TO:

Dr/Mr/Ms .....

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