

Report on First National Hepatitis E Symposium
November 6-7, 2015
Kathmandu, Nepal

Report on First National Hepatitis E Symposium
November 6-7, 2015
Kathmandu, Nepal



“A disease is so neglected that it fails to make the short list of neglected tropical diseases”
(A. Labrique, K. Nelson)

Report on First National Hepatitis E Symposium
November 6-7, 2015
Kathmandu, Nepal

Technical Committee (Alphabetically)

1. Dr. Ananta Shrestha
2. Dr. Anuj Bhattachan
3. Dr. Baburam Marasini
4. Dr. Buddha Basnyat
5. Mr. Deepak C. Bajracharya
6. Dr. Dilip Sharma
7. Dr. Ganesh Dangal
8. Dr. Gita Shakya
9. Dr. Guna Nidhi Sharma (Coordinator)
10. Dr. Prakash Ghimire
11. Dr. Shyam Raj Upreti

Organizing Committee (Alphabetically)

1. Dr. Baburam Marasini
2. Mr. Bhim Sapkota
3. Mr. Deepak Bajracharya
4. Ms. Lenjana Jimée
5. Mr. Resham Lal Lamichhane

Organized and Supported by

1. Epidemiology and Disease Control Division, DoHS, Teku, Kathmandu
2. UNICEF Country Office, Lalitpur, Nepal
3. International Vaccine Institute (IVI), Seoul, South Korea
4. Group for Technical Assistance (GTA), Lalitpur, Nepal

Report prepared by:

1. Dr. Anuj Bhattachan
2. Dr. Guna Nidhi Sharma
3. Mr. Kshitij Karki
4. Dr. Vivek Dhungana
5. Dr. Anup Bastola

Preface

Hepatitis E is one of the major diseases where many pregnant women are infected that may be fatal. Epidemics and sporadic cases were found in Nepal. Our surveillance system has not covered the Hepatitis E in the system. The available evidence of the Hepatitis E is not sufficient till now for the advocacy of HEV prevention and control strategy. Very few research works were done by individual researchers and institutions in small scale which was not disseminated and not used for any preventive actions.

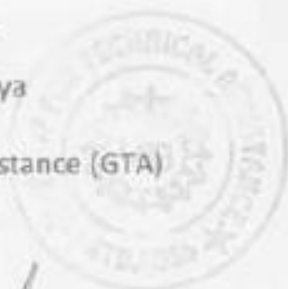
Necessity for the Symposium

First of all the symposium was important to bring the scientists, academicians, medical professionals and policy makers in one platform to discuss on the neglected disease which is preventable that can save the thousands lives. It was useful to gather and share the information from individuals and institutions regarding Hepatitis E. The symposium was held to find out the evidence on epidemiology, clinical presentation and recommendation for further action on prevention and control of Hepatitis E.

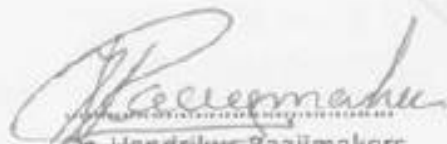
The HEV symposium is successfully organized and completed with a step forward on Hepatitis E prevention and control activity. This was conducted with the efforts of Epidemiology and Disease Control Division and the support of UNICEF, International Vaccine Institute and Group for Technical Assistance as well as other organizations and individuals. All the participants and delegates are thankful for their active participations.



Mr. Deepak C. Bajracharya
President
Group for Technical Assistance (GTA)
Lalitpur, Nepal



Dr. Laura Digilio
Deputy Director
International Vaccine Institute (IVI)
Seoul, South Korea



Dr. Hendrikus Raaijmakers
Chief, Health Section
UNICEF Country Office
Lalitpur, Nepal



Dr. Baburam Marasini
Director
Epidemiology and Disease Control Division
Kathmandu, Nepal

Director



**Report on First National Hepatitis E Symposium
November 6-7, 2015
Kathmandu, Nepal**

List of Acronyms

ANC:	Anti-natal Care
DoHS:	Department of Health Services
D-RRT:	District Rapid Response Team
EDCD:	Epidemiology and Disease Control Division
GTA:	Group for Technical Assistance
HEV:	Hepatitis E Virus
IUFD:	Intrauterine fetal death
IVI:	International Vaccine Institute
LBW:	Low Birth Weight
OD:	Open Defecation
PPP:	Public Private Partnership
RRT:	Rapid Response Team
UNICEF:	United Nations Children's Fund
WaSH:	Water, Sanitation and Hygiene
WHO:	World Health Organization

Report on First National Hepatitis E Symposium
November 6-7, 2015
Kathmandu, Nepal

Table of Contents

Preface	i
List of Acronyms.....	ii
1. Background	5
1.1 Objectives of the Symposium	5
2. Symposium Contents	6
a) Opening Session.....	6
b) Technical Sessions.....	8
i) Day I	9
ii) Day II	13
c) Working groups.....	14
Summary of Group Discussion	16
3. Key Outcomes of working group discussion	19
4. Closing Ceremony	19
5. Recommended Actions	20
Bibliography	21
Annexes.....	22
Annex 1 List of Participants.....	22
Annex 2 Agenda of the Symposium	24
Annex 3 Memories of the symposium	27

Report on First National Hepatitis E Symposium
November 6-7, 2015
Kathmandu, Nepal

1. Background

Hepatitis E is a liver disease caused by the hepatitis E virus: a non-enveloped, positive-sense, single-stranded ribonucleic acid (RNA) virus. Annually there is estimated 20 million hepatitis E infections occurs worldwide. Hepatitis E causes over 3 million symptomatic cases and 56 600 hepatitis E-related deaths annually (WHO). Hepatitis E is commonly seen among 15 to 40 years of age with fever, anorexia, jaundice, abdominal pain and other symptoms which can last for one to two weeks. It can cause chronic hepatitis among organ transplant patients. Acute hepatitis E sometime can cause fulminant hepatitis and it has been shown to occur in 20% pregnant women leading to death (WHO). HEV-infected pregnant women have higher risks of spontaneous abortion and prematurity. In South Asia, hepatitis E is estimated to be a major trigger of 10,500 deaths among pregnant women annually (Krush, 2013).

Hepatitis E Control

Currently, no treatment for HEV is available (Krush, 2013). While improving water, sanitation, and hygiene as part of the key cornerstones of a disease control strategy. These are long-term interventions requiring significant resources, which many low-income countries struggle to commit to. Vaccines are a short- to medium-term intervention that can bring immediate and measurable impact. The world's first vaccine against HEV has been produced and licensed in China after its safety and efficacy was demonstrated in Phase III clinical trial that includes over 100,000 volunteers. The use of HEV vaccine may be a promising strategy to reduce the incidence of hepatitis E. The vaccine is found safe in pregnant women as well as in the general public. However, there is a need for more investigation.

Initiative to Reduce Hepatitis E Burden in Nepal

We believe that researchers from Nepal and abroad have to team up and work toward reducing the burden of hepatitis E, especially in pregnant women. In this regard, EDCD with support from International Vaccine Institute (IVI), UNICEF and GTA is organizing a symposium on viral hepatitis of enteric origin (HAV and HEV). We strongly believe that this symposium will help us formulate a preventive strategy toward prevention and control of Viral Hepatitis E in Nepal.

1.1 Objectives of the Symposium

- To explore HEV epidemiology in Nepal
- To explore the diagnostic options and its challenges associated with HEV infection
- To discuss the clinical presentations & its complications associated with HEV infection

Report on First National Hepatitis E Symposium November 6-7, 2015 Kathmandu, Nepal

- To discuss the relation between HEV and pregnancy
- To identify preventive measures for HEV infections
- To generate recommendations in order to formulate national policy, strategy and interventions for prevention of HEV infections

2. Symposium Contents

a) Opening Session

This session commenced in Trishna hall of Gokarna Forest Resort at 1 o'clock, November 6, 2015. There was an encouraging participation of professors, researchers, medical and public health professionals from all over the country. More importantly, the leadership from various departments of Ministry of Health and Population in particular Epidemiology and Disease Control Division, National Public Health Laboratory and WHO, UNICEF, International Vaccine Institute, BPK institute of Health Sciences, National Academy of Health Sciences, Institute of Medicine, Patan Academy of Health Sciences, Dhulikhel hospital, Chitwan Medical College, Group for Technical Assistance, National Reference Laboratory, Liver Foundation Nepal and different NGOs/INGOs attended the symposium.

The symposium was inaugurated by Dr. Baburam Marasini, Director of Epidemiology and Disease Control Division lighting the Panas. Following the inauguration, Honorable chair and guests delivered their welcome and opening speeches in following order;



a) Welcome remarks from Dr. Guna Nidhi Sharma Deputy Health Administrator, Epidemiology and Disease Control Division



Dr. Sharma had welcomed all the participants, honorable guests and delegates in the first national Hepatitis E symposium. He highlighted that viral hepatitis E is one of the major enteric disease in Nepal. He also stressed the fact that there still exists high prevalence of open defecation (OD) in some of the remote districts and important cause of enteric diseases burden in Nepal. He also shared the objectives of the HEV symposium. He also expected positive and effective outcome out of this symposium.

Report on First National Hepatitis E Symposium
November 6-7, 2015
Kathmandu, Nepal

b) Opening remarks from Dr. Sushant Sahastrabuddhe

Program Leader of Enteric Diseases, International Vaccine Institute (IVI), South Korea

According to Dr. Sahastrabuddhe started his remark by saying “*Hepatitis E is the most neglected which is not even included in the list of neglected diseases*”. He congratulated Epidemiology and Disease Control Division and other partners for organizing first National Hepatitis E symposium in Nepal. He also congratulated the organizer emphasizing that this symposium is the first of its kind done at national level. He expected the recommendation as trend setter for global effort in the control and prevention of HEV from the symposium.



c) Opening remarks from Dr. Buddha Basnyat

Professor of Physiology, Patan Academy of Health Sciences, Lalitpur, Nepal



Dr. Basnyat expressed that the government of Nepal should give emphasis for the prevention and control of hepatitis E. He also stressed that HEV still remains neglected disease. Likewise, he said that, “*we were lucky that we did not have to face HEV outbreaks post-Earthquake*”. However, in his views the risk is not yet over. He was worried that more pregnant women may die from this preventable disease while we are helpless not able to protect and save lives. He also stressed that WaSH is gold standard for the prevention and control of the any enteric disease but it is not sufficient in poverty stricken remote areas of the country. So, he emphasized vaccine could be one strategy for the prevention and control of HEV.

d) Opening remarks from Dr. Sarala Malla

Ex – Director General, Department of Health Services, Nepal

Dr. Malla stated that the surveillance of the HEV is a necessity because we do not know the real burden of this disease yet. Similarly, she expressed that the improving of diagnostics for HEV is an essential component and also added the issues related in the prevention of HEV in post-earthquake situation.



e) Opening remarks from Dr. Nihal Singh

Medical Officer of WHO Country Office, Lalitpur, Nepal



Dr. Singh expressed that the prevalence of HEV is high in South Asia. The primary reason for HEV related public health problems is due to the limited access to water and sanitation, and possible outbreaks in war, conflicts and natural disasters. He also shared the information that the contaminated water and food could also be the source of HEV. He briefly mentioned about Chinese manufactured vaccine for HEV based on WHO position paper (2015). Also, Dr. Singh clearly mentioned that WHO has not recommended HEV vaccine in routine vaccination yet. There is

Report on First National Hepatitis E Symposium November 6-7, 2015 Kathmandu, Nepal

still need for sufficient evidences. However, he said that local government authorities can decide for the use of vaccines based on evidence and real public health need in the ground. Finally, Dr. Singh said that WHO recognizes HEV as public health problem in population such as pregnant women / IDP. He also expect that HEV symposium can be helpful to develop the national guideline / protocol needed (global guideline & protocol).

f) Opening remarks from Dr. Baburam Marasini Director of Epidemiology and Disease Control Division

Dr. Marasini stressed in his remark that public health problem related with emerging and reemerging diseases is a primary threat poised to both developing and developed country e.g. pandemic flu/Ebola/MERS. However, he expressed that we are still struggling with enteric diseases like HEV, which is a public health problem in Nepal. He said that we have not been able to control since long time. He stressed the fact that numerous outbreaks have been reported in urban areas of Nepal like Biratnagar outbreak in the year 2014. He also said that HEV has a long incubation period; therefore it takes almost 3 months to control the outbreak in past the epidemics and outbreaks. Referring to Annual Report of Department of Health Services, Nepal – Dr. Marasini said that there are around 50,000 cases of jaundice reported annually in Nepal which fails to describe real number and burden of HEV. There is still need a lot of work to be done to understand its real picture in the country. He also said that many people believe in traditional medicine including traditional healer and Ayurveda and therefore, people go to there for the treatment of any viral hepatitis including HEV initially. He expected a recommendation for the prevention of HEV in Nepal out of this symposium.



b) Technical Sessions

The technical session was divided into five sessions with the following sub –sessions;

- Session 1: Epidemiology and Surveillance
- Session 2: Diagnostics
- Session 3: HEV and its clinical presentation
- Session 4: HEV and Pregnancy
- Session 5: Preventive measures

Report on First National Hepatitis E Symposium
November 6-7, 2015
Kathmandu, Nepal

i) Day one

Session 1

This epidemiology and surveillance session was chaired by Dr. Buddha Basnyat. There were nine scientific presentations.

Speaker 1: Dr. Prakash Ghimire, WHO country office for Nepal

Topic: Hepatitis-E Virus Infections: Global Situation and WHO position on Hepatitis E Vaccine

Summary: In outbreak situations (high risk of Hep E) WHO recommends: Considering use of HEV 239 vaccine to mitigate risk of Hep-E outbreaks for high risk groups: Pregnant women, Travellers, Health and humanitarian relief workers. To address information gaps WHO recommends: Pre-emptive design of research protocol to study vaccine safety and immunogenicity in outbreak situations among high risk groups.

Speaker 2: Dr. Guna Nidhi Sharma, Deputy Health Administrator, EDCD

Topic: Situation of Viral hepatitis E & its surveillance in Nepal – EDCD perspective

Summary: Fifty thousand cases of Jaundice and Infective hepatitis were reported every year. This number could be just a tip of iceberg and also there is a big gap in case reporting from private Health facilities. Likewise, large numbers of jaundice patients go to traditional healers/Ayurvedic health facilities for treatment which limiting the estimation of burden of HEV in Nepal which should be studied for establishment of control and prevalence strategies.

Speaker 3: Dr. Anurag Adhikari, Liver Foundation Nepal

Topic: Asymptomatic HEV in Kathmandu

Summary: Outbreaks in different parts of Nepal had shown different clinical presentations, severity which adds in heterogeneity in HEV type in different parts. Intervention should consider characteristics of virus circulating and immune response is not uplifted/ increased with live virus being in vivo system.

Speaker 4: Dr. Thupten Lama MD, Civil Service Hospital

Topic: HEV EPIDEMIC OF BIRATNAGAR 2014

Summary: In Biratnagar and Dharan, pre-epidemic sera showed 8.3% HEV IgG indicating very low natural immunity. HEV RNA was detected in 61% of subjects. Fecal contamination was evidenced by high coliform bacteria in the water supplies. Construction and repairs of roads of Biratnagar was presumed as the cause of mixing of water and sewage pipelines. This

**Report on First National Hepatitis E Symposium
November 6-7, 2015
Kathmandu, Nepal**

contamination in population with low immunity led to this explosive epidemic with more than 8,000 being affected with an attack rate of 4.6% and 16 deaths, including that of 2 pregnant women. Rapid mass campaigning for safe drinking water was shortly ensued which led to rapid containment of epidemic.

Speaker 5: Dr. Sudhamsu K.C., Bir Hospital

Topic: Recipe for HEV epidemic in Nepal

Summary: Apart from susceptible population and HEV RNA in the sewage/ drinking water system, there may be other risk factors that may precipitate an epidemic. Proper understandings of these epidemics are important before we strive to prevent them.

Speaker 6: Dr. Deepak Kumar Yadav, BPKIHS

Topic: OUTBRAK INVESTIGATION OF HEPATITIS 'E' IN BIRATNAGAR

Summary: A large hepatitis outbreak involving around 2500 cases and 12 deaths were observed. Sewage contamination through leaking pipeline in water distribution was found as source of infection. Outbreak of hepatitis 'E' was gradually subsided after initiating the control measure in huge amount continually for a long period.

Speaker 7: Dr. Sabina Dongol, OUCRU-Nepal, PAHS

Topic: Hepatitis E virus seroprevalence in three hyperendemic areas: Nepal, Bangladesh and southwest France

Summary: Despite differences in the epidemiology and circulating genotype of HEV in Nepal, Bangladesh and southwest France, this study found more similarities in population seroprevalence than previously thought.

Speaker 8: Dr. Dipesh Tamrakar MD, Department of Community Medicine, Dhulikhel Hospital

Topic: Experience of Surveillance for Viral Hepatitis in Dhulikhel Hospital and its Outreach Centres

Summary: Hotline model of the surveillance system could be implemented in rural part of the Nepal. Hepatitis A virus is currently circulating in this region.

Speaker 9: Prativa Pandey, M.D., CIWEC Hospital and Travel Medicine Center

Topic: Enterically transmitted hepatitis among foreigners in Nepal

Summary: Hepatitis E is becoming the number one cause of hepatitis in travelers, and the risk is highest in South Asia. Hepatitis E vaccine would be of benefit to travelers to South Asia.

Report on First National Hepatitis E Symposium
November 6-7, 2015
Kathmandu, Nepal

Session 2

This diagnostics session was chaired by Dr. Sarala Malla. There were three scientific presentations in total.

Speaker 1: Dr. Geeta Shakya, Director, National Public Health Laboratory

Topic: Diagnostics for Hepatitis E Virus and its challenges in Nepal

Summary: HEV causes a water-borne epidemic of acute hepatitis in a developing country and common genotype is 1 and 2. Standardized diagnostic tests has higher sensitivity and specificity, and cost-effective. Detection of anti-HEV IgM is considered diagnostic for acute infection. The detection of HEV RNA by RT, PCR is “gold standard” for the confirmation of acute HEV infection. Considering pros and cons of both techniques, detection of anti-HEV IgM and HEV RNA should be considered for diagnosis of acute HEV infection.

Speaker 2: Prahlad Kumar Mishra

Topic: Prevalence of Hepatitis E virus (HEV) infection among patients attending Om hospital and Research Centre, Kathmandu, Nepal

Summary: Prevalence of Hepatitis E virus infection was found to be 14.4%. Maximum cases were seen in age group 16 - 40 and 56% cases were noted in females. Samples were received and analyzed from all age group but there was no incidence of HEV reactive cases below 15 years age. Hepatitis E virus infection was noted in all months but more cases were noted in Baishakh, Jestha and Bhadra according to Nepali calendar. It was a retrospective analysis, it is not known whether the females that were reactive were pregnant or not.

Speaker 3: Birendra Prasad Gupta, Liver Foundation Nepal

Topic: Three Novel Amino Acid Substitutions in RNA Dependent RNA polymerase Accelerates Hepatitis E Virus Infection in Mammalian Host

Summary: The Hepatitis E virus with RdRp-YAE mutation showed increased polymerase activity at 37°C in mammalian cells and had increased pathogenicity in experimentally infected mice compared to the wild type strain. Viral replication titers and proinflammatory cytokine levels in the lungs of mice infected with YAE are significantly higher than that of mice infected with wild type virus. YAE enhances the polymerase activity in mammalian cells, thus results suggests that the mutation YAE is likely to be favoured over TK1592 among the virus population in mammalian host.

**Report on First National Hepatitis E Symposium
November 6-7, 2015
Kathmandu, Nepal**

Session 3

This HEV and its clinical presentation session was chaired by Dr. Gyan Kayastha. There were two scientific presentations in total.

Speaker 1: Pratima Nyaupane, Patan Academy of Health Sciences, Nepal

Topic: Clinical presentation of Hepatitis E virus and results from serological and molecular diagnostic tests

Summary: Fifteen serum samples were tested with assays containing recombinant antigens designed for detection of HEV antigens designed for the detection of HEV IgM and IgG antibodies. IgM and/or IgG antibodies were detected in 14 out of 15 patients. HEV - RNA was detected in 7 out of 15 patients. Although RT -PCR was helpful in detection of circulating RNA viruses, IgM based ELISA could be equally helpful in identifying HEV cases in infected population.

Speaker 2: Nirmal Aryal, Liver Foundation Nepal

Topic: Sero-prevalence of Hepatitis E Virus among peoples living with HIV/AIDS in Nepal

Summary: Among all HIV infected patients, HEV seroprevalence was seen among 32% by anti-HEV IgG, 6% positive to anti-HEV IgM and 3% positive to HEV-Antigen cases. High seroprevalence of HEV in peoples living with HIV/AIDS were found as compared to normal population. High seroprevalence of HEV among patients infected HIV with adult age, Low CD4 count, high viral load and co-infected with other opportunistic infections.

**Report on First National Hepatitis E Symposium
November 6-7, 2015
Kathmandu, Nepal**

ii) Day II

In second day, the session was started from 8 am morning on 7th November 2015 at Gokarna Forest Resort.

Session 4

This HEV and pregnancy session was chaired by Dr. Geeta Shakya. There were three scientific presentations in total.

Speaker 1: Dr. Ashma Rana, Institute of Medicine

Topic: Maternal mortality over the last decade: a changing pattern of death due to alarming rise in hepatitis in the latter five-year period

Summary: All pregnant women must be educated to drink boiled water and consume clean and healthy food.

Speaker 2: Dr. Alessandra Berto, *Oxford University Clinical Research Unit, Wellcome Trust*

Topic: Hepatitis E outbreaks in Nepalese pregnant women

Summary: The global medical and public health communities begun to appreciate the importance of HEV infections. There are scientific, economic, cultural, and administrative obstacles to controlling the impact of HEV on morbidity and mortality worldwide. Despite the established global burden of HEV, this pathogen remains relatively neglected. Diagnostic assays with good sensitivity and specificity have only recently become commercially available, and it is important to facilitate global access to the tools necessary to identify and respond to HEV infections, whether sporadic cases or nascent outbreaks. Robust, credible surveillance is hindered by lack of medical and laboratory infrastructure and by lack of awareness of HEV.

Speaker 3: Dr. Manan Karki, Oxford University Clinical Research Unit, Patan Academy of Health Sciences

Topic: Use of Ribavirin in Hepatitis E infection in Pregnancy: Presentation on 2 Cases

Summary: It was hypothesized that Ribavirin (antiviral) can improve HEV associated biochemistry, clinical course with virological outcome. There was an improvement in liver function tests and decrease in viral load. Among both the pregnant patients after use of Ribavirin but is it due to drug or normal disease course hard to be justifiable. True biological effect needs to be established with larger patient randomized controlled trials.

Report on First National Hepatitis E Symposium
November 6-7, 2015
Kathmandu, Nepal

Session 5

This preventive measures session was chaired by Dr. Prakash Ghimire. There were two scientific presentations in total.

Speaker 1: Kazu Sekine, Health Specialist, UNICEF Nepal

Topic: WASH and prevention of Hepatitis E infection

Summary: Sixty percentage of population use improved sanitation facilities which are not shared and 26% of population practice open defecation in bush or field. Likewise, 72% of households have a specific place for hand washing where water and soap are present and 73% of households using improved source of drinking water. Similarly, 82% of households using *E. Coli* contaminated water for drinking. Almost 100,000 people gained access to improved water supply services. UNICEF distributed the hygiene kits and water purification solutions in disaster-affected areas as well as hepatitis outbreak in Biratnagar.

Speaker 1: Dr. Sushant Sahastrabuddhe, IVI

Topic: The current landscape of HEV vaccines: Timelines and ways forward

Summary: HEV infections induce maternal and child deaths and its diagnosis and treatment are difficult. Prevention by improving sanitation is far-fetched goal for developing countries. It is important to bring this vaccine outside of China, even WHO PQ which is licensed in China. Information gaps identified in the SAGE recommendations need to be considered.

c) Working groups

Context and aims:

The group work was the last activity on Day 2 of the symposium. It was aimed to integrate concepts, evidences and practices learned from various scientific presentations (*Epidemiology & Surveillance, Diagnostics, Various clinical presentations & HEV, HEV and Pregnancy, and preventive measures*) to generate recommendations in order to formulate national strategy for the prevention and control of HEV in Nepal.

Structure of the group:

The group discussion was taken in total ~2 hours before the closing ceremony of the symposium. Course participants were divided into three groups and each group discussed on assigned themes for one hour in groups. Each group had one facilitator who had directed the

**Report on First National Hepatitis E Symposium
November 6-7, 2015
Kathmandu, Nepal**

discussion according to set guidelines and key points for discussion. Each group was comprised of at least 10 persons, while the composition of the group was mixed with representation from government, academicians, lab specialists, professional organizations and public health professionals.

Each group was provided with a discussion points / papers / board + marker. One presenter was selected from each group; one of the participants was the note taker and finally prepared & delivered the presentation. All the groups were then reconvene in the main hall, where each group had given a 10 minute presentation, which was followed by 5-10 minutes of questions/discussion.

Facilitators:

Confirmed EDCD and external facilitators were indicated in the table below. The facilitator's role was not to present but to facilitate discussion leading to participants preparing their presentation.

Table 1. Facilitators

Thematic groups	EDCD Facilitator(s)	External Facilitator(s)
Group 1: Epidemiology, surveillance & diagnostics	Dr. Baburam Marasini	Dr. Budha Basnyat
Group 2: Various clinical presentations & HEV pregnancy	Dr. Guna Nidhi Sharma	Dr. Ganesh Dangal Dr. Hema Manandhar
Group 3: Preventive measures	Mr. Resham Lamichhane	Dr. Anuj Bhattachan Dr. Prakash Ghimire

Group dynamics:

All the participants were divided into different groups to ensure there were representations from government, academicians, lab specialists, professional organizations and public health professionals in each of the three groups.

Outcome:

This symposium had generated recommendations in order to formulate the national strategy in the control and prevention of future HEV outbreaks in Nepal.

Summary of Group Discussion

a) Group 1: Epidemiology, Surveillance and Diagnostics

It is the public health problem in some urban and sub-urban area, where there were outbreaks. However a comprehensive disease burden with specific risk groups needs to be understood. Often it is a sporadic and focally concentrated in particular areas but Sero-prevalence is high, especially in Kathmandu valley. It is a particularly important problem in pregnant women due to increased risks of severe morbidity and mortality. Likewise, laboratory capacity for diagnosis is limited at central and regional level. Capacity strengthening at all level is required to diagnose at most peripheral level, and coordination with private sector facilities should be established to take support of private sector in national program priorities.

Private hospitals and organization were not brought into the reporting system and 'NOTIFIABLE DISEASE' modality is not instituted. It is not known that what proportion is Hepatitis E among all jaundice (54000 reported per year). The best ways to conduct surveillance are;

- Carry out prevalence studies on representative samples of the general population in various parts of the country.
- Samples from Blood Banks could also be used.
- EDCD could facilitate active surveillance of jaundiced patients.
- Carry out a survey on Hepatitis, and/or Jaundice based on questionnaires.

Coordination among the players and stakeholders are the main challenges for surveillance. Likewise, lack of upgraded molecular facilities and also basic laboratory facilities are also the challenges. Research should be done on virulence of the virus, host factors, co-infections and drug therapy for HEV.

A comprehensive integrated surveillance to find out the prevalence and risk groups of HEV as well as preventive measures should be identified. Similarly Epidemiology and Disease Control Division should coordinate with all other stakeholders for the surveillance and ensure the availability of diagnostic facilities in all level of health facilities. Furthermore, tools should be developed for Rapid Response Team and database system should be developed.

**Report on First National Hepatitis E Symposium
November 6-7, 2015
Kathmandu, Nepal**

b) Group 2: Various Clinical Presentation and HEV in Pregnancy

The various clinical presentations are prodromal symptoms - Loss of appetite, nausea and vomiting, pain abdomen, Itching and Fever (More prominent in low age group). Likewise, Jaundice is the most common presentation (5% patients may present with anicteric hepatitis) and the complications are coagulopathy and encephalopathy. Extra-hepatic complications are acute pancreatitis (5-6%), acute kidney injury (2-3%) and less common complications are GBS and transverse Myelitis.

More often patients visit traditional/herbal/ Ayurvedic practitioners which may lead to discrepancy in burden of disease. Likewise, course of the disease is prolonged (superadded with severe dietary restrictions) and jaundice can be disappeared for longer period. Similarly, itching is more frequent in these patients (confused with obstructive jaundice) and less commonly patients have sub-acute liver failure. Obstetric Presentation is similar to the general symptoms.

Maternal complications are:

- In 1st and 2nd trimester may have normal course of illness, some cases can have spontaneous abortion, complications more common in 3rd trimester patients, may go into liver failure with mortality rate 15-40%.

Prevention of the HEV can be done by maintaining personal hygiene, sanitation, WASH intervention (Faeco-oral transmission), health education during ANC visit, practice of eating properly cooked food and proper washing of raw fruits and vegetables. Likewise, medical care such as suggestion for complete bed rest and proper food habits during 1st and 2nd trimesters.

Overall burden of disease including pregnant women, baseline prevalence to determine the threshold for epidemic, IgG status, asymptomatic carriers, availability of treatment options, trials related to use of ribavirin in 3rd trimester of pregnancy can be carried out. Moreover, vaccine efficacy in our context needs to be explored before recommending it for general population.

Awareness program on Hepatitis E with special focus on women of child bearing age should be carried. Similarly, proper nutrition during illness, compulsory admission of all patients in 3rd trimester till normalization of liver function and enforcement of WASH strategy with special focus on women of child bearing age.

**Report on First National Hepatitis E Symposium
November 6-7, 2015
Kathmandu, Nepal**

c) Group 3: Control and Preventive measures of Hepatitis E

Following activities can be done for the prevention and control of Hepatitis E;

- Education and awareness can be done at schools, community (mother's groups, FCHV—train them first), hospitality-related organizations/members
- WaSH (Water, Hygiene and Sanitation) strategy can be implemented targeting ANC (ante-natal checkups) clients, reduce open defecation and proper sewage management, safe drinking water (priority): chlorination of water, water treatment plants, chlorine tabs, boiling, solar disinfection.
- Media involvement for the awareness of people regarding prevention from HEV.
- Community participation in ward-level is essential to implement WaSH, awareness and vaccination.
- Provide rapid test kit at primary level and report HEV to concerned authority as soon as possible (provide kits before the monsoon and send it with package for other diseases like cholera-chlorine tabs etc.). Water supply pipes should be free of contamination with sewerage.
- EDCD has a protocol for RRT, needs updates and utilization. Better coordination between EDCD/D-RRT and NPHL is required for the outbreak control.
- Public private partnership (PPP) can be utilized. Tertiary care hospitals and Medical colleges are ideal for involvement.

Epidemiology and burden of HEV in Nepal is needed for vaccination. Constant /regular surveillance system should be developed. Studies need to be conducted among pregnant women which is the most vulnerable group for this infection. Ethical concern can be raised immunizing females of reproductive age vs. pregnant women.

3. Key Outcomes of working group discussion

- Based on the reports and studies, Hepatitis E is an important public health problem in urban and semi-urban areas of Nepal. Epidemiology of the HEV is not clearly known till now. Diagnostic services are not available in all level of health facilities and testing kits are not used consistently. Surveillance study should be done for the generation of evidence on Hepatitis E virus.
- HEV in pregnancy can cause severe morbidity and mortality. In 3rd trimester patients, spontaneous abortion and other complications are more common, and may go into liver failure. Likewise, other complications are bleeding disorders, high incidence of preterm labour, preterm delivery and might worsen eclampsia.
- Prevention of HEV can be done through health awareness, promotion of WaSH activities, media campaign, vaccination and community participation to the grass root level.

4. Closing Ceremony

During the closing ceremony on 7th November 2015, Dr. Baburam Marasini, Director of Epidemiology and Disease Control Division thanked all the speakers, participants and delegates for the successful completion of HEV symposium. He appreciated the works of staffs from EDCD, UNICEF country office, International Vaccine Institute and Group for Technical Assistance in successful organization of the symposium. Similarly, he committed to organize similar kind of symposium and gather the scientific evidences for other viral hepatitis. He highlighted that the recommendations from the symposium will be used to develop HEV guidelines for surveillance and prevention strategy. All the academicians, researchers, public health and medical professionals welcomed the statement. Finally, Dr. Marasini concluded the HEV symposium with a strong commitment to initiate the implementation process of the recommendations to all the participants.

5. Recommended Actions

- EDCD/DOHS should play a coordinating role between various stakeholders, scientists, clinicians, public health personnel and integrate HEV in the ongoing passive surveillance network with availability of diagnostic facilities in all level of health facilities.
- Hepatitis E database and reporting system should be established along with capacity strengthening at all level to diagnose HEV at most peripheral level, and also coordination with private sector facilities should be established to get support from private sector in national program priorities.
- Awareness program on Hepatitis E should be carried out by the government of Nepal with special focus on women of child bearing age. Also, WASH strategy need to be stressed to all with special focus on women of child bearing age should be enforced.
- Rapid response should be equipped with the skills of outbreak investigation rather than only response to outbreak.
- Conduct epidemiological study to understand the HEV disease burden and efficacy as well as cost effectiveness of the vaccines among pregnant women which is the most vulnerable group for this infection in Nepalese context.

**Report on First National Hepatitis E Symposium
November 6-7, 2015
Kathmandu, Nepal**

Bibliography

1. Kmush, Brittany, Wierzba, Thomas et al.: "Epidemiology of Hepatitis E in Low- and Middle-Income Countries of Asia and Africa", 2013 <https://www.thieme-connect.com/products/ejournals/abstract/10.1055/s-0033-1338111>
2. Wierzba, Thomas and Panzner, Ursala: "Report on the International Symposium on Hepatitis E, Seoul, South Korea, 2010" http://wwwnc.cdc.gov/eid/article/18/5/11-1916_article

Report on First National Hepatitis E Symposium
November 6-7, 2015
Kathmandu, Nepal

Annexes

Annex 1 List of Participants

S.N.	Name	Institution	Email address
1	Dr. Baburam Marasini	Director, EDCD	marasini2@yahoo.com
2	Dr. Sushant Sahastrabuddhe	Program Leader, IVI	
3	Dr. Nihal Singh	WHO	singhn@who.int
4	Dr. Prakash Ghimire	WHO	ghimire@who.int
5.	Dr. Guna Nidhi Sharma	Chief of the Epidemiology Section, EDCD	
6	Mr. Bhim Prasad Sapkota	PHO, Epidemiology and Disease Control division (EDCD)	
7	Mr. Resham Lamichhane	PHO, EDCD	reshem2016lal@yahoo.co.in
8	Dr. Geeta Shakya	Director, NPHL	geeta.nphl@gmail.com
9	Dr. Anuj Bhattachan	IVI	
10	Dr. Dilip Sharma	Bir Hospital	Dilips916@hotmail.com
11	Dr. Kedar Prasad Century	Teku Hospital	centurykp@yahoo.com
12	Dr. Anup Bastola	Teku Hospital	docanup11@gmail.com
13	Dr. Sanjay Shrestha	WARUN	ShresthaSK.ca@afirms.org
14	Prof. Dr. Asma Rana	TUTH	ashmarana2011@gmail.com
15.	Dr. Birendra Prasad Gupta	TU	birendraphd@gmail.com
16.	Dr. Buddha Basnyat	PAHS	buddhabasnyat@gmail.com
17.	Dr. Amit Aryal	PAHS	amitarjyal@yahoo.com amitaryal@gmail.com
18.	Dr. Manan Karki	PAHS	
19.	Dr. Nabin Rayamajhi	PAHS	nabin.rayamajhi@gmail.com
20	Dr. Nirmal Aryal	PAHS	hellonirmal.btech@gmail.com
21	Dr. Gyan Kayastha	PAHS	kayasthagk@hotmail.com
22	Dr. Sudhamshu KC	Bir Hospital	Sudhamshu.liver@gmail.com
23	Dr. GD Thakur	MOHP	thakuqd@gmail.com ; thakur85@hotmail.com
24	Dr. Dipesh Tamrakar	Dhulikhel Hospital	bob.dipesh@gmail.com
25	Dr. Deepak Kumar Yadav	BPKIHS	dryadav2005@gmail.com
26	Dr. Thupten Lama	Civil Service Hospital	thupten1710@hotmail.com
27	Dr. Sabina Dangol	PAHS	dongolsabina@yahoo.com
28	Deepak C. Bajracharya	GTA	bajra.deepak@gmail.com
29	Kshitij Karki	GTA	K49karki@gmail.com
30	Dr. Sarala Malla	Om Hospital	smalla504@gmail.com

Report on First National Hepatitis E Symposium
November 6-7, 2015
Kathmandu, Nepal

31	Prahlad Mishra	OM Hospital	
32	Dr. Krishna Gopal Shrestha		<i>prpkshrestha@hotmail.com</i>
33	Dr. Prativa Pandey		<i>pratibhap@gmail.com</i>
34	Dr. Shital Adhikari	CMC	<i>s.dixit@cmdnorg</i>
35	Dr. Basudev Pandey	Director, Leprosy Division	
36	Dr. Samir Mani Dixit	National Reference Laboratory	
37	Lenjana Jimée	GTA	
38	Pratima Nyeupane	PAHS	
39	Dr. Ram Raj Panthee	EDCD	<i>rpanthee@gmail.com</i>
40	Linda Kentro	USAID	<i>ikentro@usaid.gov</i>
41	Dr. Alessandra Berto		<i>aberto@oucr.org</i>
42	Dr. Anurag Adhikari	L.F.N	<i>Adhikari_anurag13@yahoo.com</i>
43	Dr. Pradeep K. Shrestha	TUTH	
44	Krista Vaidya	Dulikhel Hospital	<i>Krista_vaidya@hotmail.com</i>
45	Dr. Jeetendra Kagi Shrestha	Bir Hospital	<i>Jeetendrakagi@gmail.com</i>
46	Kazutaka Sekine	UNICEF	
47	Mr. Jagannath Poudel	EDCD	
48	Dr. Vivek Dhungana	EDCD	<i>Vivekdhungana@gmail.com</i>
49	Smita Shrestha	TU	<i>Smitabiotech01@gmail.com</i>
50	Bal Krishna Bhattachan	EDCD	<i>Balkrishna_bhattachan@hotmail.com</i>
51	Dr. Sarbagya Pandit	OURU-NP	<i>sarbagyapandit@gmail.com</i>
52	Dr. Sunil Pokharel	OURU-NP	<i>sunildrp@gmail.com</i>
53	Badri Nath Gynwali	EDCD	
54	Bai Kuntha Gautam	EDCD	
55	Dr. Neeta Pokhrel Regemi	WHO	<i>pokhrelneeta@gmail.com</i>
56	Ganesh Maharjan	GTA	
57	Prakash Budhathoki	Avinawan Media Ptd	
58	Atmaram Karki	EDCD	
59	Ratna Thapa	EDCD	
60	Mahendra	Teku Hospital	
61	Sita Ram	NPHL	

**Report on First National Hepatitis E Symposium
November 6-7, 2015
Kathmandu, Nepal**

Annex 2 Agenda of the Symposium

FIRST NATIONAL HEPATITIS E SYMPOSIUM

Venue: Gokarna Forest Resort, Gokarna, Kathmandu

Date: Friday, November 6th& 7th2015

Start Time: 12:30 PM sharp

Opening Ceremony

Time	Activities
12:30 - 01:00	Registration and Hi-Tea
01:00 – 01:10	Chief Guest –Dr. Senendra Raj Upreti, Director General, Department of Health Services, Ministry of Health and Population Chaired By Dr. Baburam Marasini, Director, Epidemiology and Disease Control Division (EDCD)
01:10 – 01:15	Opening of Hepatitis E Symposium by lighting (Panas Batti) by Dr.Senendra Raj Upreti Director General, Department of Health Services, Ministry of Health and Population
01:15 – 01:20	Welcome and Objectives of Hepatitis E Symposium -Dr. Guna Nidhi Sharma, Chief of the Epidemiology Section, EDCD
01:20 – 01:25	Remarks - Dr. Sushant Sahastrabuddhe, Program Leader, Enteric and Diarrheal Diseases, International Vaccine Institute
01:25 – 01:30	Remarks - Dr. Hendrikus Raaijmakers, Chief, Health Section, UNICEF
01:30 – 01:35	Remarks -Dr. Nihal Singh/WHO
01:35 – 01:40	Opening Remarks - Dr. Senendra Raj Upreti, Director General, Department of Health Services, Ministry of Health and Population
01:40 – 01:45	Vote of Thanks / Closing Remarks -Dr. Baburam Marasini, Director, Epidemiology and Disease Control Division (EDCD)

**Report on First National Hepatitis E Symposium
November 6-7, 2015
Kathmandu, Nepal**

TECHNICAL SESSION

Day 1 Session 1: Epidemiology and Surveillance		
Chair: Prof. Dr. Buddha Basnyat		
Time	Topic	Speaker
2:00-2:15	Global and regional update on HEV situation and WHO position paper on HEV prevention	Dr. Nihal Singh/Dr. Prakash Ghimire
2:15 - 2:30	Situation of Viral hepatitis E& its surveillance in Nepal – EDCD perspective	Dr. Guna N Sharma
2:30 - 2:45	Asymptomatic HEV carrier	Dr. Anurag Adhikari
2:45–3:00	Biratnagar HEV epidemic	Dr. Thupten Lama
3:00 - 3:15	Recipe for HEV Epidemic in Nepal	Dr. Sudhamshu KC
3:15- 3:30	Outbreak Investigation of Hepatitis E outbreak in Biratnagar, Nepal	Dr. Deepak Yadav
3:30- 3:45	Hepatitis E virus sero-prevalence in three hyperendemic areas: Nepal, Bangladesh and southwest France	Dr. Sabina Dangol
3:45- 4:00	Experience of surveillance for viral hepatitis in Dhulikhel hospital and its outreach network	Dr. Dipesh Tamrakar
4:00-4:15	Etiology of enterically-transmitted hepatitis among foreigners in Nepal	Dr. Pratibha Pandey
Day 1 Session 2: Diagnostics		
Chair: Dr. Sarala Malla		
Time	Topic	Speaker
4:45 -5:00	Diagnostics for the identification of HEV and its challenges in Nepal	Dr. Geeta Shakya
5:00-5:15	Experience on HEV diagnostics in Om Hospital	Dr. Sarala Malla
5:15-5:30	HEV mutation in Biratnagar Epidemic	Dr. Birendra Gupta
Day 1 Session 3: HEV and its clinical presentation		
Chair: Dr. Gyan Kayastha		
Time	Topic	Speaker
5:45-6:00	Clinical presentation of Hepatitis E virus and results from serological and molecular diagnostic tests	Ms. Pratima Nyaupane
6:00-6:15	Sero-prevalence of Hepatitis E Virus among peoples living with HIV/AIDS in Nepal	Dr. Nirmal Aryal

**Report on First National Hepatitis E Symposium
November 6-7, 2015
Kathmandu, Nepal**

Day 2 _ 7th Nov, 2015 / Session 4: HEV and Pregnancy

Chair: Dr. Geeta Shakya

Time	Topic	Speaker
8:30-8:45	Maternal mortality over the last decade: a changing pattern of death due to alarming rise in hepatitis in the latter five-year period	Dr. Asma Rana
8:45-9:00	Hepatitis E outbreaks in Nepalese pregnant women (Oxford Research group)	Dr. Alessandra Berto
9:00-9:15	The Use of Ribavirin in Hepatitis E in Pregnancy: A Report of Two Cases	Dr. Amit Aryal/Dr. Manan Karki,

Day 2 Session 5: Preventive measures

Chair: Dr. Prakash Ghimire/WHO

Time	Topic	Speaker
9:30-9:45	UNICEF position on control and prevention of HEV – WASH perspective	UNICEF
9:45-10:00	The current landscape of HEV vaccines: Timelines and ways forward	Dr. Sushant Sahastrabuddhe, IIVI

Day 2: Group Discussion Session

Time	Topic	Responsibility
10:30-11:30	Group Work	Group members/Facilitators
11:30-11:45	Presentation by Group 1	Team Leader Group 1
11:45-12:00	Presentation by Group 2	Team Leader Group 2
12:00-12:15	Presentation by Group 3	Team Leader Group 3
12:15-12:30	Break	
12:30-12:45	Summary of the Group Work	Symposium Coordinator
12:45-1:00	Closing & remarks	

Report on First National Hepatitis E Symposium
November 6-7, 2015
Kathmandu, Nepal

Annex 3 Memories of the symposium

