Technical Meeting on Raising Awareness, Surveillance, Prevention and Management of Viral Hepatitis in Mongolia

12 September 2014
Ulaanbaatar, Mongolia
Participants of the Technical Meeting on Raising Awareness, Surveillance, Prevention and Management of Viral Hepatitis in Mongolia
12 September 2014
Ulaanbaatar, Mongolia
TECHNICAL MEETING ON RAISING AWARENESS, SURVEILLANCE, PREVENTION AND MANAGEMENT OF VIRAL HEPATITIS IN MONGOLIA

Ulaanbaatar, Mongolia
12 September 2014

Convened by:
MINISTRY OF HEALTH, GOVERNMENT OF MONGOLIA AND WORLD HEALTH ORGANIZATION REPRESENTATIVE OFFICE IN MONGOLIA, REGIONAL OFFICE FOR THE WESTERN PACIFIC

Not for sale

Printed and distributed by:
World Health Organization
Regional Office for the Western Pacific
Manila, Philippines

16 March 2014
NOTE

The views expressed in this report are those of the participants of the Technical meeting on raising awareness, surveillance, prevention and management of viral hepatitis in Mongolia and do not necessarily reflect the policies of the World Health Organization.
Contents

ABBREVIATIONS

SUMMARY

1. INTRODUCTION .................................................................................................................. 1
   1.1 Aim and objectives ....................................................................................................... 1
   1.2 Organization ............................................................................................................... 1
   1.3 Opening remarks ....................................................................................................... 1

2. PROCEEDINGS .................................................................................................................. 2
   2.1 Session 1: Introduction ............................................................................................. 2
   2.2 Session 2. Viral hepatitis surveillance and monitoring ............................................. 5
   2.3 Session 3: Viral hepatitis diagnosis, treatment and drugs ........................................ 10

3. CLOSING AND RECOMMENDATIONS ............................................................................. 13

ANNEXES:
   ANNEX 1 – AGENDA ....................................................................................................... 15
   ANNEX 2 – LIST OF PARTICIPANTS ............................................................................ 17

Keywords:
Hepatitis, HBV, HCV, HDV, Mongolia, infection control, surveillance, prevention, Treatment.
ABBREVIATIONS

aimag provincial health facility (first-level administrative division)
anti-HBc antibody to hepatitis B core antigen
anti-HBs antibody to hepatitis B surface antigen
ALT alanine transaminase
APASL Asia-Pacific Society for the Study of Liver
APRI aspartate aminotransferase-to-platelet ratio index
BD birth dose
CDC Centers for Disease Control and Prevention
CHB chronic hepatitis B
CHC chronic hepatitis C
CME continuing medical education
ELISA enzyme-linked immunosorbent assay
EPI Expanded Programme on Immunization
EQAS external quality assurance system
EWAR early warning and response
GAVI Global Alliance for Vaccines and Immunization
GDP gross domestic product
GHP Global viral Hepatitis Programme
Global Fund Global Fund to Fight AIDS, Tuberculosis and Malaria
GT genotype
HAI hospital-acquired infection
HAV hepatitis A virus
HBeAg hepatitis B e antigen
HBIG hepatitis B immune globulin
HBsAg hepatitis B surface antigen
HBV hepatitis B virus
HCC hepatocellular carcinoma
HCV hepatitis C virus
HDV hepatitis D virus
HEV hepatitis E virus
MOH Ministry of Health
NCC National Cancer Center
NCCD National Center for Communicable Disease
NCI National Cancer Institute (USA)
NCTM National Center for Transfusion Medicine
PMTCT prevention of mother-to-child transmission
PWID people who inject drugs
QA quality assurance
RBV ribavirin
SOP standard operating procedures
<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>soum</td>
<td>district health facility (second-level administrative division)</td>
</tr>
<tr>
<td>STI</td>
<td>sexually transmitted infection</td>
</tr>
<tr>
<td>SVR</td>
<td>sustained virological response</td>
</tr>
<tr>
<td>TB</td>
<td>tuberculosis</td>
</tr>
<tr>
<td>TNM</td>
<td>classification system for malignant tumours (tumour/node/metastasis)</td>
</tr>
<tr>
<td>TTI</td>
<td>transfusion-transmitted infection</td>
</tr>
<tr>
<td>WHO</td>
<td>World Health Organization</td>
</tr>
</tbody>
</table>
SUMMARY

The Ministry of Health, Mongolia and the National Center for Communicable Diseases (NCCD) convened a one-day technical meeting on viral hepatitis in Mongolia, in collaboration with the World Health Organization (WHO) Representative Office in Mongolia and WHO Regional Office for the Western Pacific. The meeting was held at the Ministry of Health, Ulaanbaatar on 12 September 2014.

The aim of the meeting was to discuss the burden of viral hepatitis, related liver disease including liver cancer, and to develop a process for strategic actions on viral hepatitis in Mongolia.

Mongolia has a high burden viral hepatitis and related liver disease. The prevalence of chronic hepatitis B infection in adults has been estimated at ~11–12% in two major multi-province studies in 2003–2005 and in 2013. HBV genotype D accounts for >90% of cases. The prevalence of hepatitis delta virus (HDV) coinfection in HBsAg-positive individuals is as high as 40% in some studies. The population prevalence of hepatitis C antibody (anti-HCV) was estimated to be 15.6% in data from 2003 to 2005, and 11% in 2013. Mongolia has the highest rate of liver cancer and mortality from liver cancer in the world, and these rates are increasing. Liver cancer is responsible for 44% of all cancers in Mongolia, with the highest rates in the eastern provinces. Over 95% of liver cancer cases are associated with HBV and/or HCV infection.

Mongolia’s National Strategy for the Control of Viral Hepatitis (2010–2015) has achieved its goal of reducing viral hepatitis incidence to 10 cases per 10 000 by 2015. The prevalence of hepatitis B surface antigen (HBsAg) among 4–6 year olds is now 0.34%, meeting the regional goal of <1.0%. In addition, the introduction of vaccination against hepatitis A virus (HAV) into routine vaccination schedules has reduced the proportion of acute jaundice cases related to HAV infection. Planning is now under way for the new viral hepatitis strategy from 2015 onwards.

In Mongolia, acute jaundice surveillance began in 1952, with peak incidence in the early 1960s. Mongolia’s early warning and response (EWAR) system began in 2007 and has now been rolled out to all provinces. The EWAR system collects essential clinical and demographic information on people with infectious disease syndromes, including acute jaundice. The National Hepatitis and EnteroViral Laboratory (NHEL), established in 2010 at the NCCD, is the national reference laboratory for viral hepatitis. The National Center for Transfusion Medicine (NCTM) manages blood products and blood banks in all 21 provinces. All (100%) blood is screened for HBsAg, anti-HCV, anti-HIV and syphilis serology. The major centre providing clinical management for viral hepatitis is the NCCD, which provides assessment and care for acute and chronic viral hepatitis. Progress in the clinical management of chronic hepatitis is hampered by a lack of national clinical guidelines, and an allocated budget for antiviral treatment.

The most important meeting recommendation was that key outcomes discussed at the meeting would be incorporated into the new national viral hepatitis strategy to be launched in 2015. The WHO Regional Office will participate in development of the national strategy. The strategy is envisioned to align with the forthcoming regional action plan on viral hepatitis. Consensus building may facilitate further effective action on viral hepatitis.
1. INTRODUCTION

Mongolia has a high burden of viral hepatitis, especially due to hepatitis A virus (HAV), chronic hepatitis B virus (HBV), hepatitis C virus (HCV) and hepatitis delta virus (HDV) infections. Data on hepatitis E virus (HEV) infection in Mongolia are scant.

The World Health Organization (WHO) Regional Office for the Western Pacific is working towards a regional hepatitis action plan to be released in 2015. Mongolia’s National Strategy for the Control of Viral Hepatitis covers 2010–2015. Planning is under way for the next national strategy. To support Mongolia to develop the new national strategy, and to allow alignment of national and regional strategies for viral hepatitis, a meeting of key stakeholders was held in Ulaanbaatar on 12 September 2014 at the Ministry of Health. The agenda for the one-day meeting is available at Annex 1. The list of participants is available at Annex 2.

1.1 Aim and objectives
Aim: to discuss the burden of viral hepatitis and related liver cancer, and develop a process for strategic actions on viral hepatitis in Mongolia.

The meeting objectives were:

(1) to update national stakeholders on global and regional hepatitis action plans and recent developments;
(2) to review available viral hepatitis and liver cancer data in Mongolia;
(3) to discuss issues on viral hepatitis awareness, surveillance, prevention and treatment in Mongolia; and
(4) to develop strategic actions and agree on next steps on viral hepatitis in Mongolia.

1.2 Organization
The meeting was attended by 54 participants including: 12 staff of the Mongolian Ministry of Health, seven staff of the National Center for Communicable Disease (NCCD), two staff of the Center for Health Development, two staff of the National Cancer Center, three staff of the National Transfusion Center, senior staff from large general hospitals in Ulaanbaatar, the Mongolian Medical Academy, United States Centers for Disease Control and Prevention (US-CDC) and WHO staff from the Mongolian Representative Office and Regional Office.

1.3 Opening remarks
Dr Amarsanaa, Vice Minister of Health, Mongolia opened the meeting. He emphasized that viral hepatitides are common across the world and that viral hepatitis is a major public health priority, both globally and in Mongolia. Two billion people have been infected by HBV and there are 240 million people living with chronic hepatitis B worldwide.

Mongolia has a high burden of hepatitis B and C infections. Liver cancer and liver cirrhosis are major public health issues. The prevalence of chronic hepatitis B infection in the general population ranges from 9.8% to 20%, while for hepatitis C the range is 10–15%.
Vaccination against HBV was introduced in 1991. In 2009–2010, a national study on hepatitis B surface antigen (HBsAg) seroprevalence among 5 year olds reported a prevalence of 0.53%, indicating that Mongolia had reached the regional goal of less than 1%.

Despite this achievement, many Mongolians are living with chronic hepatitis B and C. The prevalence of chronic hepatitis among health-care workers is even higher.

Mongolia has successfully implemented the National Strategy on Viral Hepatitis Prevention and Control, 2010–2015. Dr Amarsanaa concluded by noting the importance of developing a national programme on viral hepatitis control from 2016 onwards, which will be aligned with the upcoming regional hepatitis strategy.

Dr Soe, WHO Representative in Mongolia, noted that this was one of the first meetings focusing on a comprehensive response to viral hepatitis in the Western Pacific Region, which was strongly supported by the Ministry of Health. He emphasized the importance of working together and noted global events in play to reduce the prices of medications and improve access. Similarly to HIV drugs, which were very expensive initially, but have reduced considerably in price over time. Discussions are under way with generic manufacturers in India to produce less expensive medications for viral hepatitis, which will ultimately benefit many countries. He emphasized caution in making long-term commitments on drug prices as prices will reduce in future.

Dr Surenkhand, Deputy Director, National Centre for Communicable Diseases (NCCD) hoped the participants would increase the understanding of viral hepatitis and help to improve policy documents in Mongolia.

2. PROCEEDINGS

2.1 Session 1: Introduction

2.1.1 Update on the Global and Regional Hepatitis Programme

Dr Ying-Ru Lo provided a summary of the global and regional burden of viral hepatitis. Compared with other major infectious diseases, the burden of viral hepatitis is high. Globally, mortality from viral hepatitis is equivalent to that of HIV and tuberculosis (TB) combined, while in Asia, there were more deaths from viral hepatitis than HIV and TB. The majority of viral hepatitis deaths are from HBV followed by HCV infection.

The WHO Global Hepatitis Programme has developed a four-axis framework for viral hepatitis response:
1. Cooperation between partners to formulate effective policies.
2. Strategic information for policy and action.
3. Effective partnerships in the prevention of transmission.

The regional response has also gained momentum with an informal viral hepatitis meeting (Manila, April 2014), the appointment of a viral hepatitis focal point in the Regional Office in August, and a side event on viral hepatitis at the sixty-fifth session of the Regional Committee.
Lessons from the HIV response include: (1) a public health approach is effective in mounting a comprehensive response; (2) medicines must be accessible to patients, particularly through affordable drug prices; (3) ambitious goals combined with major funding initiatives can assist low- and middle-income countries in providing comprehensive responses, such as the WHO 3 by 5 initiative and the Global Fund to Fight AIDS, Tuberculosis and Malaria (the Global Fund); (4) simplified treatment regimens; (5) innovative and simplified diagnostics; (6) new service delivery models, including decentralization and task shifting; (7) monitoring the treatment cascade; (8) linking programme planning to surveillance and monitoring systems; (9) high-quality research; and (10) engagement with the affected community.

Countries can build on the success of immunization programmes, develop national strategies for viral hepatitis to include prevention and treatment, and achieve major antiviral price reductions. One strategy for Mongolia might be to determine the disease burden through triangulation of available data in a workshop, and pilot a hepatitis treatment cascade intervention to determine suitable service delivery models prior to scale up.

2.1.2 Comprehensive action on viral hepatitis

Dr Nick Walsh provided an update of the global progress in addressing viral hepatitis, including the 2014 WHO Guidelines for screening, care and treatment for hepatitis C infection.

In 2010, and again in 2014, the World Health Assembly called for comprehensive action on viral hepatitis. In response, the Global Hepatitis Programme developed the four-axes framework for action.

Prevention has to be a key component of action on hepatitis. Transmission in health-care settings has been a major issue in many countries, including Mongolia. WHO has issued a number of guidance documents on infection control (including viral hepatitis) in health-care settings. These include the WHO Best practices for injections and related procedures toolkit (2010), Standard precautions in health care (2007), Guidelines on hand hygiene in health care (2009), and the Aide-memoire: standard infection control precautions in health care (2006).

Prevention of viral hepatitis can be enhanced through a number of key activities, including hepatitis B vaccination, screening of the blood supply, ensuring safe therapeutic injection practices, ensuring adequate sterilization of surgical equipment, maintaining universal precautions in health-care settings, having safe sex (condoms), providing harm reduction for people who inject drugs, counselling infected persons to reduce transmission risk behaviour, and testing for HBV and HCV (HDV in some settings).

The mechanism of liver disease in chronic HBV and HCV infection is ongoing liver inflammation and progressive fibrosis (scarring). Progression of liver disease in viral hepatitis is modulated by several key factors; these include age, gender (men > women), coinfection with other viruses, diabetes and exposure to liver toxins such as aflatoxin. In the case of HBV infection, the genotype causing the infection, persistence of HBeAg and coinfection with HDV can accelerate disease.

Consequently, secondary prevention focuses on hepatitis A virus (HAV) and HBV vaccination to prevent superinfection, and on reducing alcohol consumption. The staging of liver disease is an important consideration when assessing the need for treatment, particularly in HCV infection. Effective viral hepatitis treatment will reduce the progression and complications of liver disease, including the development of cancer.
WHO recommends the use of the treatment cascade as a framework for monitoring progress through the continuum of care (from diagnosis to treatment) at a population level and to identify points at which there is a loss to follow up (leak). Staging of liver disease as part of the cascade prior to treatment initiation is important, as it prioritizes patients with advanced liver disease for treatment, especially in settings with limited resources.

The second part of the presentation focused on the 2014 WHO Guidelines for the screening, care and treatment of hepatitis C (1). Key aspects highlighted were as follows: (1) anti-HCV antibody is the screening test, while HCV RNA estimation is the confirmatory test; (2) assessment of alcohol intake is recommended, as is intervention if indicated, given the interaction between chronic HCV and alcohol; (3) non-invasive testing to stage liver disease is recommended. Aspartate aminotransferase-to-platelet ratio index (APRI) and FIB-4 are two recommended tests that are widely available, cheap and have a similar sensitivity and specificity to Fibroscan; and (4) all chronically infected individuals, including people who inject drugs (PWID), should be assessed for treatment.

Implementation of these and upcoming viral hepatitis screening, care and treatment guidelines require consideration of a number of factors. Of particular importance is the local epidemiology of viral hepatitis (existing genotypes, priority populations), accessibility of treatment, intersectoral overlaps (for example, with HIV) and the cost of treatment. The latter is especially relevant, given the high cost of new, effective direct-acting antivirals for hepatitis C.

In conclusion, WHO guidance relates to viral hepatitis surveillance: technical guidance for middle- and low-income settings (in early 2015) and Guidelines for the screening, care and treatment of HBV infection (also in early 2015).

### 2.1.3 Addressing hepatitis B and C infections in the USA

Dr Geoff Beckett spoke of the development of the US hepatitis policy in response to the identification of chronic HBV and HCV epidemics in the USA. An estimated 800 000 to 1 400 000 people live with chronic HBV in the USA, and 2.7–3.9 million live with chronic HCV. In 2007, mortality attributable to HCV infection in the US superseded HIV-attributable mortality.

Public health prevention and management strategies were initiated from the early shortly after HCV had been identified. In the 2010s, highly effective direct-acting antivirals for HCV treatment became available and US CDC issued recommendations for HCV screening of all people born between 1945 and 1965.

In 1998, US CDC published recommendations that health-care providers should offer HCV testing to all people with a history of any risk for HCV exposure and to people with unexplained liver disease (e.g. elevation of alanine transaminase (ALT)).

However, by 2012, only about half of people with chronic HCV infection were aware of their status, and only a small proportion of those diagnosed were receiving HCV-directed medical care. At US CDC, epidemiologists and health economists developed models that predicted that almost half (1.47 million) of the 3 million people now living with HCV would develop cirrhosis in the absence of medical interventions, 350 000 would develop hepatocellular carcinoma (HCC) and that almost 900 000 people would die of HCV-related disease during the coming decades. Modelling also showed that enhanced screening and identification of people with chronic HCV infection and the administration of effective care and treatment could avert many deaths and complications, and would be cost effective.
In 2010, the Institute of Medicine (a prestigious institution of accomplished scientists and clinicians) released a report on hepatitis B and C, and proposed a national strategy for prevention and control, focused especially on decreasing the burden of liver cancer(2). The strategy identified low levels of awareness among providers and the public, and inadequate allocation of resources to address the HBV and HCV epidemics. Recommended strategies centred on improving surveillance, public and provider education, immunization and integration of viral hepatitis services. This report and subsequent evaluations and analyses identified barriers to HCV testing and treatment among health-care providers (lack of expertise, limited access to specialists for referral and consultation, concerns about cost and effectiveness of treatment) and among patients (limited geographical and financial access to treatment specialists, asymptomatic nature of early infection and disease, stigma and access to treatment).

In 2011, the US Department of Health and Human Services responded to the Institute of Medicine report by publishing “An action plan for the prevention, care and treatment of viral hepatitis”, which set goals for US CDC and its sister health agencies to address education, training, primary prevention, surveillance and immunization-related problems (3). Specifically, this included: educating providers and communities; improving testing, care and treatment; strengthening surveillance of viral hepatitis transmission and disease; eliminating vaccine-preventable viral hepatitis; reducing viral hepatitis caused by drug-use behaviours; and protecting patients and workers from health-care-associated viral hepatitis.

In 2012, US CDC published new recommendations for the identification of HCV infection, which expanded criteria for testing to include all people in the 1945–1965 birth cohort (“baby boomers”) who comprise the majority of Americans with hepatitis C (4). One of the main recommendations was a one-time test for adults born between 1945 and 1965 without prior assessment of risk. This was based on the higher prevalence (this cohort includes 2 in 3 Americans with chronic HCV infection) as well as benefits of therapy in reducing liver cancer risk and all-cause mortality.

To assist implementation of these recommendations, CDC behavioural scientists and communications specialists developed a targeted and phased multimedia education and awareness-raising campaign (“Know More Hepatitis”) for persons at risk, for the general public, and for health professionals, and published a simplified algorithm for HCV screening in 2013. Finally, as funding became available in 2012 and 2013, CDC initiated a number of demonstration projects intended to develop and evaluate models of care in a variety of settings, which would increase HCV testing and facilitate linkage to medical care for those who are HCV RNA positive.

Similar demonstration projects were also initiated to improve HBV testing for people at risk and provide linkage to care and treatment for those who are HBsAg positive. As lessons are learnt from the evaluation of these initiatives, information will help to inform further advances in viral hepatitis testing and treatment policies.

While new HBV and HCV treatments have become available, primary prevention of new infections remains a key public health responsibility. For example, an epidemic of HCV infection was recently identified in many rural and suburban communities in the USA among young adults who inject heroin and other opiates. Developing and implementing more effective primary prevention strategies remains critical, as well as attending to the testing and assurance of care for those who are infected.
2.2 Session 2. Viral hepatitis surveillance and monitoring

2.2.1 Surveillance and reporting system for communicable diseases

Dr Ambaselmaa provided an overview of the communicable disease reporting system in place in Mongolia. The early warning and response (EWAR) system aims to detect events early and respond appropriately. The system operates at all levels of the Mongolian health system. It was introduced in 2007 in three provinces and later expanded to all provinces. Reporting units (1300 in total) are located at aimags, at the district level and at the national level. While some analysis and collaborative response does occur at the district level, the response and financial planning is mainly conducted at the national level. There is reporting from the NCCD to higher levels in the MOH. Both event and indicator reporting occurs.

EWAR reporting is syndromic. There are six major syndromes, with viral hepatitis covered through the proxy of jaundice. There are both passive and active reporting systems for communicable diseases. Active surveillance is conducted for vaccine-preventable diseases and influenza infections. The influenza reporting system (since 2009) utilizes reporting from selected sentinel sites. Passive surveillance is done for other infections, which are reported monthly. Immunization surveillance is both passive and active, including vaccine coverage and vaccine expenditure.

A TB and sexually transmitted infection (STI) information and surveillance system operates within the NCCD, and includes the option for voluntary reporting (the other systems do not). The system, supported with Global Fund funding, is web-based. The system includes case reports, drug monitoring, expenditure and resistance. When communicable disease reports are received at the NCCD, a response team is sent to the field if detailed further investigation is required. Responses may include outbreak investigation and monitoring measures.

The NCCD has a responsibility to monitor hospital-acquired infections (HAI) and respond accordingly. The reporting system is the same as described above. Single cases of HAI are considered to represent an outbreak, and must be reported within 24 hours. Weekly reporting occurs through the EWAR system. Monthly and quarterly summaries are reported.

2.2.2 National strategy for viral hepatitis control – lessons learnt

Dr G. Surenkhand presented the key lessons learnt following implementation of the national strategy for viral hepatitis control, which can inform the proposed new national strategy.

Mongolia started reporting jaundice (the proxy for acute viral hepatitis) in 1952 and has since recorded more than 530 000 cases of acute jaundice. The peak incidence occurred in 1962 (331/10 000 people).

Key changes to the epidemic curve occurred after the introduction of HBV vaccination in 1991 (3–4 doses at birth/infancy), and after the introduction of HAV vaccination in 2012 (2 doses at 1.2 years and 2 years of age). Both resulted in marked reductions in acute jaundice cases. For example, with regard to hepatitis B, a recent retrospective review of all cases of jaundice associated with acute hepatitis B at the NCCD (2009–2013, N = 508) found that 91% were born prior to 1998. Currently, the prevalence of HBsAg among 4–6-year-old children in Mongolia is <2% (0.34%).

Peak ages for reported acute jaundice cases admitted to the NCCD are 2–9 years for HAV, 15–35 years for HBV and >24 years for HCV. Dr Surenkhand noted that health-care workers are
at particular risk of viral hepatitis infection, with higher rates of anti-HCV antibody and hepatitis B core antibody (HBcAb) than the general population.

Chronic viral infection is associated with the development of liver fibrosis, cirrhosis and HCC. Infection with multiple hepatitis viruses increases this risk. For example, a retrospective review of HCC patients at the NCCD found that 31% had dual infection with either HBV/HDV or HBV/HCV, while 19% had triple (HBV/HCV/HDV) infection. The incidence of HCC has been steadily increasing since record-keeping began in 1967. Liver cancer accounts for 38.5% of all cancers in Mongolia and 43.8% of all cancer deaths (5).

The National Strategy on Viral Hepatitis Control, 2010–2015 was approved by Ministerial Order # 119 and had the strategic goal to decrease the incidence of viral hepatitis to 10 cases per 10 000 population by 2015 through four objectives: (1) to introduce vaccination for viral hepatitis A in a phase-based manner; (2) to control viral hepatitis B and C, and decrease the hepatitis B surface antigen (HBsAg) carrier rate to <2% among children less than 5 years of age; (3) to strengthen capacity for surveillance, control and laboratory diagnosis of viral hepatitis; (4) to increase intersectoral coordination for strategy implementation; and (5) to monitor and evaluate the strategy, including a mid-term review in 2012. Within the strategic objectives are nine indicators relating specifically to vaccination, and five focusing on diagnosis and treatment.

A number of recommendations for the new strategy were proposed. These include increasing antenatal screening among pregnant women for HBsAg and hepatitis B e antigen (HBeAg), ensure complete reporting of these data, and providing HBV vaccination to infants born to HBsAg-positive women (including administration of hepatitis B immune globulin (HBIG)). The birth dose of vaccine should be a priority. The prevention of viral hepatitis in health-care workers must be a priority. Laboratory capacity should be strengthened for improved identification of viral hepatitis markers at the aimag and district levels, including in places where these tests are not currently available. Genotype testing should be provided. Follow-up care after discharge of patients admitted for HBV or HCV infection or for exacerbation of hepatitis is weak, so practitioner training is required. Improving information systems for acute and chronic hepatitis should be a focus. Finally, there is a need to build awareness in the general population to assist with action on viral hepatitis.

2.2.3 Epidemiology of viral hepatitis and sequelae in Mongolia

Dr Oidov Baatarkhuu presented the epidemiology of viral hepatitis B, C and D, and discussed disease outcomes based on published and unpublished data.

Mongolia has high endemicity for three bloodborne hepatitis viruses – HBV, HCV and HDV. The number of patients with acute hepatitis has decreased considerably from the estimated annual 13 000 cases in 1991 to 3200 cases in 2013. Hepatitis B and C virus infections are major causes of liver cirrhosis and HCC in Mongolia.

Dr Baatarkhuu presented the work of his group on the epidemiology of viral hepatitis in Mongolia (6). The study was conducted in 12 provinces and Ulaanbaatar from 2003 to 2005, and published in 2008. The national prevalence of anti-HCV was 15.6%, while that of HCV RNA was 11%. Prevalence was higher in those > 40 years old.

The study estimated that there were 267 000 people living with HCV in Mongolia. There were no gender differences in prevalence. The key risks were undergoing dental procedures, surgery, tattooing or being a health-care worker. Genotype 1b was found in 98.8% of the sample. The prevalence of genotype 1b was 93.1% in Ulaanbaatar, and 100% in rural areas. The prevalence of genotype 2a was 6.9% in Ulaanbaatar and lower elsewhere.
Health-care workers were at particular risk for HCV infection. There were 40 nurses included in the analysis with a prevalence of anti-HCV antibody of 20.8%. The prevalence went up to 60% in the age cohort >51 years. The prevalence among those who had worked for more than 5 years was also substantially higher than those who had worked less than 5 years.

Published data were presented on risk factors for HBV and HDV in 12 provinces and Ulaanbaatar (O. Baatarkhuu, Y. Dahgwahdorj, et al., Asian Pacific Association for the Study of the Liver (APASL] 2012). The prevalence of HBV in “apparently” healthy individuals in Mongolia was 11.8%, and that of HDV was 4.8%. The major risk factors for HBV infection (in order from the highest to the lowest) were having a history of hospitalization, dental care, tattooing, surgery, a family history of hepatitis and blood transfusion. The risk factors for HDV were (in order of frequency) dental procedures, surgery and tattooing.

A 2013 study by the Onom Foundation, conducted in four provinces and Ulaanbaatar, found a prevalence of 10.6% for HBsAg and 11.1% for anti-HCV antibody among adults. There was no major difference in prevalence in these provinces. Again, the prevalence of HCV increased with age, particularly above 45 years. HBV prevalence did not vary with age in adults, suggesting past vertical or perinatal transmission.

Dr Baatarkhuu presented data from a 2005 examination of viral hepatitis aetiology in a cohort of 118 patients with acute jaundice, treated at the NCCD (7). The prevalence of acute HAV was 16.4%, while acute HBV was 32.4%, HDV superinfection in chronic HBV was present in 27.3%, HBV/HDV coinfection in 1.8% and HCV in 6.4%. There was no HEV identified in these acute cases. Genotype distribution among these patients with acute jaundice was as follows: HAV genotype was 100% 1a; HBV genotypes were D (98.3%) and C (1.3%); HCV genotype was 1b (100%); and HDV genotype was 1 (100%). Most HAV cases (83%) were seen in the youngest cohort (16–19 years) while 22/36 (60%) of acute HBV infections were seen in 20–29-year-olds and 12/36 (33%) in 16–19-year-olds. Of 30 persons who had HDV superinfections complicating chronic HBV infection, 93% were less than 29 years of age. Of the acute HCV infections, 5/7 (70%) were above 30 years of age. Surgery and dental care were identified as the most common risk factors among persons with acute HBV, acute HCV and acute HDV, although there were other potential risk factors as well.

Recent (unpublished) data indicate that over 75% of acute jaundice cases in Mongolia result from either acute HAV or HBV infection. In 2014, 29% were HAV related and 5% HCV related (both relatively stable since 2004 – 33% and 5%, respectively), while 9% had HDV superinfection. The prevalence of superinfection with HDV in acute jaundice cases has reduced from 27% in 2004.

Older data on chronic hepatitis infection indicated dual and triple infections were common among individuals with chronic liver disease and live carcinoma (8). Of HCC cases in Mongolia, 95–98% are related to HBV and/or HCV infection. Triple (HBV/HCV/HDV) infection was identified in 63% of individuals with HCC, compared with 0% of healthy individuals. It was suggested that coinfection and triple infection influence the likelihood of HCC in Mongolia.

Cancer is the second most common cause of death in Mongolia after circulatory disorders (9). Liver cancer is responsible for 44% of all cancers. Stomach cancer is the next most common (14.7%). The mean age at diagnosis of HCC is 61 years, and males account for 55% of cases. Cirrhosis is present in most patients with HCC (84% of all cases). Among persons with HCC, 46% are anti-HCV antibody positive, 34% HBsAg positive, and 14% have coinfection (much higher proportions attributable to viral hepatitis than in other countries). Patients with HCC are diagnosed late; 65% have lesions ≥5 cm, 14% have only one tumour and 18.5% have M1 disease. The mean alpha-fetoprotein level at diagnosis is 196 ng/mL. There is limited treatment
available for HCC, a fact that is complicated by late presentation. Consequently, HCC outcomes are poor, with >50% surviving <2 years. The 5-year survival is 7%.

### 2.2.4 Monitoring blood bank systems for transfusion-transmitted disease, including viral hepatitis

Ts Alimaa outlined the management of blood products and transfusion safety in Mongolia. Facilities managing blood products include the NCTM in Ulaanbaatar, and 26 blood banks in the 21 provinces. In addition, blood products are available in 347 *soums*. The NCTM is responsible for maintaining the safety of blood supply and providing guidance to hospital blood banks. In rural areas, provincial hospitals oversee *soum*-level blood product management. Governance, including approval of guidelines, is under the Ministry of Health.

A voluntary, non-remunerative blood donor system was implemented in 1994. The rate of blood donation nationwide is 7.7 units/1000 population, being higher (12/1000) in Ulaanbaatar and lower in rural areas. All (100%) donated blood is screened at all levels of the health sector for anti-HIV (since 1987) HBsAg (since 1996), anti-HCV and syphilis (since 1997). Screening methods differ by level of the health system. At the NCTM, enzyme-linked immunosorbent assay (ELISA) and polymerase chain reaction (PCR) are used. At blood banks (in *aimags*), ELISA and particle agglutination are used, while at health centres (*soums*), only rapid tests are used.

In 2013, 10.5% of donations tested positive for one of the screened infections, a decrease from 13.6% in 2009. The most common infection was HBV (4.3%) followed by syphilis (3.1%) and HCV (3%). No cases of HIV have been detected in the past five years. At the NCTM, nucleic acid testing of donated blood began in 2012. In 2013, the prevalence of HBV DNA was 0.24% for people who tested HBsAg-negative, while HCV RNA was 0.04% in people testing anti-HCV negative.

WHO provided financial assistance to the NCTM to screen for HIV, HBV and HCV from 2005 to 2009. Since 2010, the Global Fund has provided funding for blood banks to screen for HIV, HBV, HCV and syphilis. A domestic external quality assurance system (EQAS) commenced in 2012 with technical assistance from the National Reference Laboratory of Australia (NRL) in collaboration with the NCCD. This EQAS programme focuses on serology testing for transfusion-transmitted infections (TTIs) at all levels of the health system, including *soums*. The EQAS panel is twice annual anti-HIV, anti-HCV, HBsAg and *Treponema pallidum* antibody.

Recommendations for further improvement of transfusion services in Mongolia include continuing improvement of test kits and equipment (calibration, service and maintenance), and expanding the number of laboratories participating in EQAS. Finally, there is a need to set up an internal quality control system for TTI testing.

### 2.2.5 Cancer registry system for liver cancer and other liver diseases

Ts Badamsuren provided an overview of the cancer registry system in Mongolia, with a focus on liver cancer.

The National Cancer Registry is a population-based reporting system. Data are reported from 21 province hospitals, nine district hospitals in Ulaanbataar, 16 other specialized hospitals and the National Pathology Register. The registry is both passive and active. Data reported are confirmed from the original source by the National Cancer Center. While reporting is not
electronic, most data are sent electronically. Collected data is line-by-line and identifying, and includes name and social security numbers, which can then be used to correlate with the original source.

There are limited human resources with only three people working at the Registry. The Center provides training for oncology residents and cancer registrars as well as statisticians within clinics. There is a high turnover of staff in the office. Regular training may provide an incentive that will improve retention. There are guidelines and manuals in the Registry, including the Cancer Registry Guidelines (approved by the MOH), the International Classification of Diseases system and a manual for cancer registrars. There are plans to introduce the tumour, node, metastasis (TNM) manual to stage disease.

Compared to other countries (10), both the incidence and mortality associated with liver cancer are the highest in the world. In 2013, there were 1967 new cases of liver cancer, 2792 cases being followed from previous years and 1578 deaths. Liver cancer is by far the most common cancer in both men and women. Liver cancer represents 43% of all cancers among men and 34% of all cancers among women. The rate of increase in liver cancer for men annually is 1.37/100,000 while for women it is 1.59, indicating that there will be larger numbers of liver cancer cases in the coming years. The highest rate of liver cancer in Mongolia is in the eastern region of the country, peaking in Sukhbaatar, which is the province with the highest rate (more than double the national average). Investigations into the cause of the variability in prevalence have not been undertaken, beyond there being a higher prevalence of viral hepatitis in the eastern region of the country.

Of all cancers, 45% are confirmed histopathologically, while only 11.5% of liver cancer is confirmed in this way. Liver cancer is usually diagnosed late, with 48% being diagnosed at TNM stage III, and 33% at TNM stage IV. Consequently, treatment options are limited and survival is poor. Of the 1967 diagnoses in 2013, 10.8% received surgery, 6.9% chemotherapy and 76.4% received palliative care. The 1-year survival for liver cancer is currently 22%, 3-year 10%, and 5-year survival is 7%.

2.3 Session 3: Viral hepatitis diagnosis, treatment and drugs
Moderator Dr Ya. Amarjargal, Head of Medical Services Division, Ministry of Health

2.3.1 Hepatitis laboratory support and external quality assurance services in Mongolia

Laboratory support is key to all aspects of comprehensive action on viral hepatitis. Dr G. Sarangua outlined the legal framework, capacity and challenges facing laboratory support for viral hepatitis in Mongolia.

The legal framework for action on viral hepatitis was created in 1990, when a Ministerial Order first outlined a national strategy to begin addressing viral hepatitis. Formal laboratory standards and protocols were established in 2007. Each level of the health system currently has a standard operating procedure (SOP) on viral hepatitis.

Laboratory standards and protocols were developed in 2007. There are laboratory SOPs at the different levels of the health systems. Two objectives in the national strategy relate to laboratory support:

- objective 2: Limiting the spread of viral hepatitis and HBsAg carriers to <2% among children under age 5; and
objective 3: Improve capacity of viral hepatitis surveillance, case management and laboratory diagnosis.

The NCCD is the key implementer of these objectives.

The National Hepatitis and Enteroviral Laboratory was established at the NCCD in 2012 and functions as the National Reference Laboratory. It has developed SOPs for Mongolia based on key external and domestic guidelines, including WHO and US-CDC guidance on surveillance, diagnosis and treatment, Mongolian laws related to health, hygiene and immunization, and Ministerial Orders.

The Hepatitis and Enteroviral Laboratory at NCCD provides viral hepatitis, rotavirus and enterovirus testing. The staff profile is three laboratory doctors, one biologist, three laboratory technicians and one assistant. Equipment includes ELISA, reverse transcriptase (RT)-PCR and immunoflocytometer. The laboratory has the capacity for genotyping of rotavirus, but not for genotyping the hepatitis viruses.

External quality assurance for the Reference Laboratory began in 2010 with the Korean-CDC. At the Hepatitis and Enteroviral Reference Laboratory, the sensitivity and specificity is >99.5% for ELISA (HBsAg and anti-HCV) and for HBV DNA and HCV RNA PCR. The RT-PCR system at the NCCD is Cobas E411-ECL, which is fully automated and can run 48 samples concurrently over 5–6 hours, including HBV DNA and HCV RNA at a cost of 95 000–100 000 MNT per test. Currently, around seven samples are run per week. Costs are covered by health insurance only if the patient is hospitalized.

The NCCD has participated in international EQAS since 2011. The National Transfusion Center joined an international external quality assurance programme in 2005, while other blood banks joined the programme in 2010.

Domestic EQAS commenced in 2011. Technical assistance has been provided by the Australian National Reference Laboratory (Melbourne), which provided initial and ongoing training, and supported the development of policy documentation. Tests included in EQAS are anti-HIV1/2, anti-HCV: and HBsAg and syphilis antibody. In 2013, there were 46 laboratories participating (21 aimags, 5 soums, 9 district-level health facilities and 11 hospitals in Ulaanbaatar). There are also plans to include the private sector.

In addition to EQAS, the Mongolian Viral Hepatitis Reference Laboratory has undertaken an equipment and human laboratory survey, and established a plasma pool for controlled packaging, including identifying the plasma components to be included.

The challenges to laboratory testing for viral hepatitis are many and varied, but include the diversity of test kit quality, adherence by laboratories to SOPs for EQAS, use of expired products, insufficient human resources and difficulty in double-checking the results.

Dr Sarangua recommended: (1) current SOPs at the various levels of the health services should be updated; (2) an internal quality assurance system should be introduced; (3) management of reagents should be strengthened; (4) equipment servicing and maintenance should be improved; (5) training for laboratory staff should be emphasized; (6) a Health Ministerial Order is recommended to implement a nationwide external quality assurance programme; and (7) clear lines of responsibility should be established within the laboratory networks.
2.3.2 Current status of the clinical management of viral hepatitis in Mongolia

Dr G. Batsukh presented clinical data on the management of acute and chronic hepatitis at the NCCD. The NCCD has a special inpatient unit for managing acute jaundice. The proportion of acute HBV cases by birth cohort begins to decline in those born from 1995 onwards. There are very few (<1%) acute HBV cases in those born after 2002. This would suggest that HBV vaccination coverage among infants improved in the 1990s and reached optimal effectiveness in the early to mid-2000s.

Acute jaundice cases admitted to the NCCD have a mandatory follow-up period of 3–6 months for acute HAV, and 1–2 years for HBV or HCV, and lifelong for HDV. Follow up is done at the outpatient department of the NCCD. Since 2009, the proportion of patients followed up post HAV has declined, while that for HBV and HCV has increased, reflecting the changing epidemiology of HAV infection since the introduction of infant vaccination. Ministerial Order #318 focuses on symptomatic treatment of acute and chronic hepatitis, and antiviral treatment for chronic hepatitis.

Data on the likelihood of developing chronic viral hepatitis following acute HBV, HCV or HDV varied widely in the rate of chronicity by province for both HBV and HCV, indicating data recording and management issues at the provincial level.

The cost of managing acute jaundice at the NCCD is highest for HBV inpatients, followed by that for HCV inpatients. The cost of managing acute HAV patients is around 25% of cost of HBV inpatients. HBV inpatient management costs increased from 2009 to 2013 at a more rapid rate than that for the other viral hepatitides, largely related to the costs of medicines.

Only 36 individuals have been treated at the NCCD for HCV with a combination of pegylated interferon/ribavirin (PEG-IFN/RBV) since 2010. The overall sustained virological response (SVR) is 52%. Major challenges for HCV antiviral therapy in Mongolia are the absence of national guidelines for the management of viral hepatitis, persisting supply issues for diagnostic reagents and the high cost of treatment.

Dr Batsukh recommended: (1) further training; (2) updating the national viral hepatitis clinical guidelines; (3) incorporating clear clinical management guidance into the new national strategy (post 2015); (4) allocating a budget specifically for antiviral therapy; and (5) improved treatment monitoring systems.

2.3.3 Training and health worker development in communicable diseases in Mongolia

Dr Bayarsaikhan provided an overview of the postgraduate training initiatives at the NCCD for health workers. Two key Ministerial Orders relate to the training of doctors. These are (1) Joint Order No. 491/A/472 of the Health Minister and Minister of Education and Science “Approval of updated regulation” 27 December 2013, and (2) Health Ministerial Order on “Approval of mainstream and index of postgraduate specialization training” 17 February 2014.

Training is divided into continuing medical education (CME) and specialization training. Specialization training is further divided into either core (essential) training or advanced training (specialization). Medical postgraduate training takes 1–3 years. Graduate doctors need to work in general medicine for 2 years and can only then apply for a residency programme. The NCCD has provided specialty training under permission from the Health Development Centre (Order #43) since 2002. Postgraduate training topics include HIV, viral hepatitis, STIs, intestinal infections,
airborne and droplet infections, and zoonotic infections as well as other topics. The time is divided roughly equally between these topics. The NCCD has provided postgraduate training to 37 infectious disease specialists and 19 epidemiologists.

The training duration varies for the various medical specialities. Residency for infectious disease practitioners and TB specialists is one year. Residency for epidemiologists and paediatric infectious disease practitioners is six months, while advanced training for infectious disease practitioners, TB specialists or epidemiologists is three months. The NCCD has provided training (including CME) to 211 specialists (epidemiology and infectious diseases) over the past 10 years.

3. CLOSING AND RECOMMENDATIONS

In her closing remarks, Dr D. Narangerel focused on the transition from the national strategy ending in 2015 to the next strategy. Dr Y. Amarjargal stated that the discussions in this workshop will be recorded and incorporated into the new national strategy.

Dr Soe presented the closing remarks. He thanked delegates and stressed that the new viral hepatitis strategy should include key issues discussed during the meeting. WHO’s primary mission in Mongolia is to support the Mongolian people. Both WHO and US CDC approach viral hepatitis through the lens of evidence and will continue to provide the Government of Mongolia with evidence-based recommendations. WHO is engaged in viral hepatitis prevention and control at the global level and will bring its experience from this effort around the world to Mongolia. WHO is developing a regional strategy for viral hepatitis, and it is suggested that the new Mongolian national plan be developed in synchrony with this process. WHO seeks to provide all the necessary support to Mongolia so that the new national strategy can be optimized.

In addition to the recommendations at the conclusion of each presentation, the following key recommendations were made at the conclusion of the meeting:

1) There is a need to continue to build consensus around hepatitis action in Mongolia.

2) Key outcomes of the workshop will be incorporated into the new national viral hepatitis strategy.

3) The new National Strategy for Viral Hepatitis will be launched in 2015.

4) Relevant clinical guidelines will be revised in line with WHO guidelines on prevention, care and treatment of hepatitis B and C in 2015.

5) There is a need to improve the quality of data on hepatitis.

6) WHO will participate in the strategy development process, which will align with the time and content of the regional strategy.

7) Mongolia will participate in development of the WHO regional hepatitis action plan.
REFERENCES

ANNEX 1 – AGENDA

Technical meeting on raising awareness, surveillance, prevention and management of viral hepatitis in Mongolia

**Aim:** To discuss burden of viral hepatitis and related liver cancer and develop strategic actions on viral hepatitis

**Specific objectives:**
1. To update national stakeholders on global and regional hepatitis action plans and recent developments
2. To review available viral hepatitis and liver cancer data in Mongolia
3. To discuss issues on viral hepatitis awareness, surveillance, prevention and treatment in Mongolia
4. To develop strategic actions and agree on next steps on viral hepatitis

**Date and time:** Friday, 12 September 2014, 9.00-17.15

**Venue:** Meeting hall “B”, Ministry of Health

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
<th>Responsible</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:00-9:20</td>
<td>Opening remarks</td>
<td>J. Amarsanaa, Vice Minister of Health Dr Soe Nyunt-U, WHO representative Mongolia</td>
</tr>
<tr>
<td>9:20-9:30</td>
<td>Objectives and expected outcomes of the meeting</td>
<td>G. Surenkhand, Deputy Director of NCCD</td>
</tr>
<tr>
<td>9:30-10:00</td>
<td>Group photograph</td>
<td>M. Oyun, NCCD</td>
</tr>
</tbody>
</table>

**Part 1. Introduction, Moderator, D. Narangerel, Head of Public health division, MOH**

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
<th>Responsible</th>
</tr>
</thead>
<tbody>
<tr>
<td>10:00-10:20</td>
<td>Update on the Global and Regional Hepatitis Programme (GHP)</td>
<td>Ying Ru-Lo (World Health Organization WESTERN PACIFIC REGIONAL OFFICE)</td>
</tr>
<tr>
<td></td>
<td>What can we learn from HIV for viral hepatitis</td>
<td></td>
</tr>
<tr>
<td>10:20-10:35</td>
<td>World Health Organization hepatitis C treatment guidelines</td>
<td>Nick Walsh (World Health Organization WESTERN PACIFIC REGIONAL OFFICE)</td>
</tr>
<tr>
<td>10:35-10:50</td>
<td>Moving from silent epidemic through data to response – experience from the US</td>
<td>Geoff Beckett (US-CDC)</td>
</tr>
<tr>
<td>10:50-11:15</td>
<td>Questions and answers</td>
<td></td>
</tr>
<tr>
<td>11:15-11:30</td>
<td>Coffee/tea break</td>
<td></td>
</tr>
</tbody>
</table>

**Part 2. Viral hepatitis surveillance and monitoring, Moderator Dr D. Narangerel, Head of Public health division, MOH**

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
<th>Responsible</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:30-11:50</td>
<td>Surveillance and reporting system for communicable diseases:</td>
<td>A. Ambaselmaa, Head of Infectious disease surveillance and research department, NCCD</td>
</tr>
<tr>
<td></td>
<td>- Viral hepatitis</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- EPI</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- HIV/STI</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- TB</td>
<td></td>
</tr>
<tr>
<td>11:50-12:10</td>
<td>National strategy for viral hepatitis control: implementation progress, weakness, lessons learnt, challenges and issues</td>
<td>G. Surenkhand, First Deputy Director of NCCD</td>
</tr>
<tr>
<td>12:10-12:30</td>
<td>Prevalence and genotype of viral hepatitis in</td>
<td>O. Baatarkhuu, President of Mongolian</td>
</tr>
<tr>
<td>Time</td>
<td>Event Description</td>
<td>Presenter/Position</td>
</tr>
<tr>
<td>--------------</td>
<td>-----------------------------------------------------------------------------------</td>
<td>--------------------------------------------------------</td>
</tr>
<tr>
<td>12:3-12:50</td>
<td>Monitoring blood bank system for the detection of transfusion transmitted diseases (TTD) including viral hepatitis</td>
<td>Ts. Alimaa, Deputy Director of National Center of Transfusiology</td>
</tr>
<tr>
<td>12.50 -13.10</td>
<td>Cancer registry system for liver cancer and other liver diseases</td>
<td>Ts. Badamsuren, Head of public health, research and training department, National Cancer Center</td>
</tr>
<tr>
<td>13:10-14:30</td>
<td>Lunch at Laviva restaurant</td>
<td></td>
</tr>
<tr>
<td>14:30-15:00</td>
<td>Q/A and discussions on the data</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Part 3. Viral hepatitis diagnosis, treatment and drugs, Moderator Dr Ya. Amarjargal, Head of medical services division, MOH</strong></td>
<td></td>
</tr>
<tr>
<td>15:00-15:15</td>
<td>Hepatitis diagnostic infrastructure: laboratory diagnosis, validation and EQAS-hepatitis test kit</td>
<td>G. Sarangua, Viral hepatitis laboratory head, NCCD</td>
</tr>
<tr>
<td>15:15-15:30</td>
<td>Availability of viral hepatitis clinical services and treatment in Mongolia. Hepatitis management and treatment guidelines in Mongolia</td>
<td>B. Batsukh, Head of emergency department, NCCD</td>
</tr>
<tr>
<td>15:30-15:45</td>
<td>Training of health care workers on communicable diseases (skills based epidemiology training, residency training)</td>
<td>J. Bayarsaikhan, Officer in charge of training, NCCD</td>
</tr>
<tr>
<td>15.45-16.00</td>
<td>Coffee tea break</td>
<td></td>
</tr>
<tr>
<td>16.00-17.00</td>
<td>Q/A and discussions on the data</td>
<td></td>
</tr>
<tr>
<td>17.00-17.15</td>
<td>Closing remarks</td>
<td>C. Narangerel, Head of Public health division, MOH</td>
</tr>
<tr>
<td>18:00</td>
<td>Welcome reception at the Continental hotel</td>
<td></td>
</tr>
</tbody>
</table>
ANNEX 2 – LIST OF PARTICIPANTS

List of participants for technical discussion on viral hepatitis

Ministry of Health:

1. Vice Minister of Health, Dr J. Amarsanaa
2. D. Narangerel, Director, Division of Public Health
3. S. Evlegsuren, OIC for Policy implementation and coordination for the prevention and control of communicable diseases including hepatitis
4. S Amarzaya, OIC for Policy implementation and coordination for the prevention and control of STIs/AIDS/Tuberculosis
5. Ya. Amarjargal, Director, Division of Medical Services
6. A. Unurjargal, Division of Medical Services
7. J. Munkhjargal, Division of Medical Services
8. N. Bolormaa, Division of Medical Services
9. B. Purevjav, Division of Medical Services
10. G. Soyolgerel, Policy Implementation and coordination Department
11. M. Uranchimeg, Head of Division of pharmaceuticals and medical devices
12. N. Oyungerel, Policy planning department, MOH
13. L. Jargalmaa, media focal point, MOH,

Center for Health Development

14. Ch. Bat-erdene, Director
15. Ts. Amarzaya, Head, Division for regulation of postgraduate trainings

National Center for Communicable Diseases (NCCD)

16. Dr D. Nyamkhuu, Director-General, NCCD
17. Dr G. Surenkhand, Deputy-Director, NCCD
18. S. Enkhbold, Deputy Director for research, training and foreign affairs
19. M. Tunsag, Deputy Director for medical Services
20. Dr A. Ambaselmaa, Head of Surveillance and research department
21. N. Tsend, NCCD
22. G. Sarangua, Head of viral hepatitis laboratory
23. M. Oyun, Hepatitis department, NCCD
24. Ts. Amgalan, Hepatitis department
25. A. Baasanjav, Hepatitis department
26. Ts. Narangarav, Hepatitis department
27. J. Nyamsuren, Infection control unit
28. N. Suvdmaa,
29. B. Batsukh, Infectious clinic
30. O. Sumiya, quality manager
31. J. Bayarsaikhan, OIC of training
32. Ch. Urtnasan, media focal point
33. Mr Tsendjav, hepatitis clinic
34. Mr. Puntsag, Head of TB surveillance and research department
Bayanzurkh district health department
35. J. Tamir, Director
36. Ch. Byambaa, epidemiologist

National Cancer Center
37. L. Tumurbaatar, Director
38. Ts. Badamsuren, Head of Public Health, Research and training

National Blood Transfusion Center
39. N. Erdenebayar, Director
40. T. Alimaa, Deputy Director
41. M. Tserendejid, Head of reference laboratory

General tertiary hospitals
42. B. Byambadorj, Director of general hospital #1
43. G. Bayasgalan, Director of general hospital #2
44. Ts. Tumur-Ochir, Director of general hospital #3

Mongolian association for study liver diseases
45. O. Baatarkhuu, President
46. Undram, Board member

World Health Organization:
47. Dr Soe Nyunt-U, WHO representative, World Health Organization/CO
48. Dr J. Narantuya, TO/HIV/STI, World Health Organization/CO
49. Dr O. Ariuntuya, TO/ESR
50. Dr E. Erdenechimeg, TO/HCF, World Health Organization/CO
51. Dr B. Tsogsolmaa, TO/NCD
52. Dr Ying-Ru, Team Leader, HIV, Hepatitis and STI, World Health Organization Western Pacific Regional Office
53. Dr Nick Walsh, Medical Officer, Viral Hepatitis, World Health Organization Western Pacific Regional Office
54. Geoffrey A. Beckett, prevention branch chief, Division of viral hepatitis, US CDC