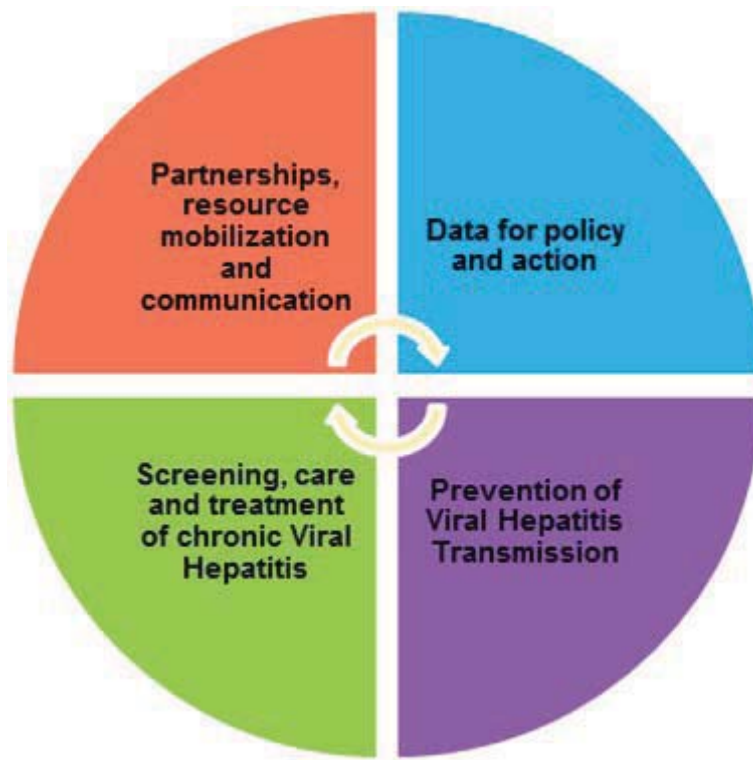


Informal Expert Working Group Meeting on Surveillance, Prevention and Management of Viral Hepatitis in the Western Pacific Region

Regional Hepatitis Action Plan



Manila, Philippines
1–2 April 2014



Participants of the Informal Expert Working Group Meeting on Surveillance, Prevention and Management of Viral Hepatitis in the Western Pacific Region
Manila, Philippines, 1–2 April 2014

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INFORMAL EXPERT WORKING GROUP MEETING ON SURVEILLANCE,
PREVENTION AND MANAGEMENT OF VIRAL HEPATITIS IN THE WESTERN
PACIFIC REGION

Manila, Philippines
1–2 April 2014

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NOTE

The views expressed in this report are those of the participants at the Informal Expert Working Group Meeting on Surveillance, Prevention and Management of Viral Hepatitis in the Western Pacific Region and do not necessarily reflect the policies of the Organization.

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Keywords:

Hepatitis – epidemiology, prevention and control / Hepatitis, viral, Human / Hepatitis viruses / Immunization
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ABBREVIATIONS

ALT	alanine aminotransferase
anti-HBc	antibody to hepatitis B core antigen
anti-HBs	antibody to hepatitis B surface antigen
anti-HCV	antibody to hepatitis C virus
APASL	Asian Pacific Association for the Study of the Liver
CDC	(United States) Centers for Disease Control and Prevention
CEA	cost-effectiveness analysis
EPI	Expanded Programme on Immunization
EQA	external quality assessment
GHP	Global Viral Hepatitis Programme
HBIG	hepatitis B immune globulin
HBeAg	hepatitis B e antigen
HBPTPP	Hepatitis B Perinatal Transmission Prevention Program (Republic of Korea)
HBsAg	hepatitis B surface antigen
HBV	hepatitis B virus
HCC	hepatocellular carcinoma
HCV	hepatitis C virus
HLA	human leukocyte antigen
ICER	incremental cost-effectiveness ratio
IQA	internal quality assessment
PEG-IFN	pegylated interferon
PMTCT	prevention of mother-to-child transmission
PWID	people who inject drugs
QA	quality assurance
QALY	quality-adjusted life year
STAC	Strategic Technical and Advisory Committee
STAG	Strategic Technical and Advisory Group
UNICEF	United Nations Children's Fund
VIDRL	Victorian Infectious Diseases Reference Laboratory (Australia)
WHO	World Health Organization

SUMMARY

The World Health Organization (WHO) Regional Office for the Western Pacific convened the first meeting of the Informal Expert Working Group on Surveillance, Prevention and Management of Viral Hepatitis in the Western Pacific Region in Manila, Philippines from 1 to 2 April 2014. The meeting was attended by 11 temporary advisers from eight countries in the Western Pacific Region (Australia, China, Mongolia, Republic of Korea, Japan, Malaysia, the Philippines and Viet Nam), three resource persons (participating remotely), one consultant, three observers (one each from China, France and the United States), and 14 members of the WHO Secretariat. The goal of the meeting was to identify activities for the development of a regional priority action plan for viral hepatitis within the 2012 WHO Framework for Global Action.

The Western Pacific Region was the first to adopt the goal of reducing the prevalence of hepatitis B infection, as indicated by the seroprevalence of hepatitis B surface antigen (HBsAg), to less than 2% among children at least 5 years of age by 2012 and to less than 1% prevalence by 2017, through universal three-dose hepatitis B vaccination of infants, with the first dose provided within 24 hours of birth. Although the Region has largely reached the 2012 goal, as 30 of 37 countries and areas in the Region have reduced the proportion of 5-year-old children infected with hepatitis B to less than 2%, additional measures toward improved awareness, surveillance, prevention and management are needed, as the Region continues to bear the highest global burden of viral hepatitis-related deaths. Further, the majority (~85%) of cases of liver cancer, which is among the most common cancers in the Region, are due to hepatitis B or C virus infection. In order to address the tremendous burden of morbidity and mortality from viral hepatitis, the Regional Office for the Western Pacific has taken the initiative to develop a plan to guide priority activities for countries of the Region to improve awareness, surveillance, prevention and management of viral hepatitis. Convening the meeting of the Informal Expert Working Group was the first step toward this initiative.

The two-day meeting on 1–2 April 2014 consisted of five sessions. The first four sessions were devoted to presentations and discussions of each of the four axes that comprise the WHO Framework for Global Action. During the fifth session, attendees drew conclusions from first four sessions, and developed recommendations for priority activities under each axis. The following is a summary of the key recommendations that will form the basis of the regional priority action plan for viral hepatitis.

Summary of recommendations

Axis 1: Raising awareness, promoting partnerships and mobilizing resources

- (1) A multisectoral National Hepatitis Task Force should be constituted, which comprises policy-makers, health-care providers (medical associations or societies), researchers, media, nongovernment organizations, and representatives from affected communities and people living with chronic active hepatitis B and C.
- (2) High-quality information and education should be developed, including ambitious targets (such as the "3 by 5" initiative for HIV) and aspirational messages, to reduce stigma, discrimination and raise awareness about viral hepatitis in the community, and among providers, civil societies and policy-makers.
- (3) A focal point should be identified in the ministry of health to coordinate all viral hepatitis-related activities, including the development and implementation of a national action plan that addresses awareness, surveillance, prevention and management of viral hepatitis.

(4) Through a situational analysis of the burden of disease, data should be derived to develop evidence-based policies and mobilize resources for the prevention and control of viral hepatitis.

Axis 2: Evidence-based policy and data for action

(5) Using existing data resources, a situational analysis should be conducted of the burden of disease of viral hepatitis, with a focus on hepatitis B and C, but including the burden of hepatitis A, hepatitis D and hepatitis E where appropriate; gaps in epidemiological profiles should be identified and an operational research agenda developed accordingly to fill up the gaps.

(6) A plan or strategy should be developed for ongoing viral hepatitis surveillance in the country.

(7) Laboratory capacity should be built for quality-controlled diagnostics by designating at least one WHO national reference laboratory in the country (where feasible), validating available test kits, and developing testing strategies and algorithms.

Axis 3: Prevention of transmission

(8) More than 95% coverage should be achieved with three doses of hepatitis B vaccine, including the birth dose, through education of parents in antenatal clinics, greater leadership by professional societies and providers, and partnerships with organizations with a common goal.

(9) Transmission in health-care settings should be reduced through strengthening prevention measures: universal hepatitis B vaccination of health-care workers, safe therapeutic injection practices, investigation of outbreaks to identify gaps in infection control, and implementing the WHO universal precautions and infection control guidelines.

(10) Transmission should also be reduced in people who inject drugs by setting up an infrastructure to reach them, and implementing the WHO-recommended harm reduction interventions (2013).

(11) Universal access to safe blood and blood products should be ensured through mandatory screening that includes testing for hepatitis B and C, and implementation of the WHO Global Strategic Plan (2008–2015) for universal access to safe blood transfusion.

Axis 4: Screening, care and treatment

(12) Screening should be conducted in populations at risk for HBV and HCV infection and settings serving these populations; populations at increased risk of infection should be identified through existing data and studies.

(13) It should be ensured that persons detected with infection receive counselling and follow up for treatment eligibility, and receive treatment if eligible.

(14) Health-care capacity to diagnose and treat chronic active hepatitis B and C disease should be built by training primary care providers.

(15) Equitable access to HBV and HCV medicines and diagnostics for hepatitis B and C should be improved through dialogue with stakeholders (e.g. the pharmaceutical industry).

These recommendations for priority activities were based on regional immunization targets, gaps in existing programmes and resources covering these activities, and the burden of disease in certain settings and subpopulations. Although not listed among the Region's new priority activities, efforts to ensure food and water safety as global public goods should continue. Countries should also conduct other viral hepatitis prevention and control activities as recommended by the WHO Global Viral Hepatitis Programme.

As next steps, the Informal Working Group members were requested to identify other experts in the fields of viral hepatitis, policy and communication, who would need to provide feedback for the

development of the regional priority action plan for viral hepatitis. The goal is to finalize an outline by the middle of 2014, develop and finalize the regional priority plan for viral hepatitis by early 2015 for approval by Member States, and convene a Strategic and Technical Advisory Group (STAG).

1. INTRODUCTION

The countries of the World Health Organization (WHO) Western Pacific Region have a heavy burden of morbidity and mortality from viral hepatitis, mostly from hepatitis B (HBV) and hepatitis C (HCV) viruses. Liver cancer caused by HBV infection is among the top three causes of death from cancer in men, and a major cause of cancer in women in this Region. Chronic HBV infection remains hyperendemic in China and many other countries of the Region, with prevalence rates of over 7% among adult cohorts in most of these countries. Because of a large proportion of women who deliver at home in some countries, challenges remain in reaching newborns and providing hepatitis B vaccination within 24 hours of birth (the most effective protection). Better HBV surveillance is also needed, as the burden of disease in the Region is extremely varied and most estimates are based on extrapolations of severely limited data.

The situation of HCV prevention and management is more complex and less well documented than that of HBV. HCV transmission is driven by unsafe medical practices, including blood transfusions and medical procedures and injections, and sharing contaminated injecting equipment among PWID (some data show up to 74% prevalence of infection in those who inject drugs). Despite the recent development of effective, well-tolerated medications that have the potential to achieve cure in more than 90% of those with HCV infection, challenges include the low rates of diagnosis, poor linkages to care and lack of access to treatment among HCV-infected persons. In 2010, the World Health Assembly passed resolution WHA63.18 on viral hepatitis. This resolution provides a mandate to improve hepatitis prevention and control by strengthening the health system's capacity to address viral hepatitis, and proposes a context where new tools for primary (e.g. vaccination and injection safety) and secondary prevention of viral hepatitis (e.g. diagnostics, treatment) can be adopted and integrated into existing systems. Collaborations at the global, regional and national levels will be key for implementation. In January 2011, an informal consultation at WHO headquarters defined the directions of the new WHO Global Viral Hepatitis Programme (GHP) by publishing a Framework for Global Action based on the following four axes:¹

(1) raising awareness, promoting partnerships and mobilizing resources; (2) evidence-based policy and data for action; (3) prevention of transmission; and (4) screening, care and treatment.

As the WHO Regional Office for the Western Pacific works with countries to reach the goal of less than 1% prevalence of hepatitis B surface antigen (HBsAg) among children aged 5 years or older through immunization, it also needs to help prepare countries for the next steps of reducing viral hepatitis-related morbidity and mortality, within the WHO Framework of Global Action, through improved advocacy and awareness, surveillance, prevention and management, including linkages to care and treatment. With the goal of identifying key activities for the regional priority action plan for viral hepatitis, the first Meeting of the Informal Expert Working Group on Surveillance, Prevention and Management of Viral Hepatitis in the Western Pacific Region was held in Manila, the Philippines from 1 to 2 April 2014.

1.1 Objectives

- (1) To determine gaps and activities within each of the axes of the WHO Global Hepatitis Programme
- (2) To discuss the outline of the regional priority action plan for viral hepatitis to improve awareness, surveillance, prevention and management

¹ <http://www.who.int/csr/disease/hepatitis/Framework/en/index.html> (accessed 14 May 2014).

- (3) To develop next steps, timelines, and roles and responsibilities of Working Group members and the Secretariat.

1.2 Organization

The meeting was attended by 11 temporary advisers from eight countries in the Region, three resource persons (one each from Australia, United Kingdom and the United States presented remotely via WebEx), one consultant, three observers (one each from China, France and the United States), and 14 members of the WHO Secretariat. The agenda of the meeting is provided in Annex 1 and the list of participants in Annex 2.

1.3 Opening remarks

Dr Shin Young-soo, WHO Regional Director for the Western Pacific, welcomed participants and opened the meeting by affirming the Regional Office's strong commitment to hepatitis prevention and management. Although great strides have been made in achieving the 2012 milestone of HBV infection prevalence of less than 2% among children aged 5 years, Dr Shin articulated the need for ongoing work to achieve the 2017 goal of less than 1% hepatitis B prevalence in children, and for strong hepatitis prevention and management campaigns, advocacy and commitment by governments of countries. About a quarter of the world's population lives in the Region, yet it is home to half of the chronic hepatitis B cases globally.

The good news is that now both HBV and HCV can be treated. For example, tenofovir, a drug used for HIV treatment, can cost less than one dollar a day. Several new drugs with the potential to cure hepatitis C with three months of treatment are now available. However, better awareness among providers is needed to improve treatment rates, the cost of both HBV and HCV medication needs to be reduced, and standard guidelines and resolutions to advocate for treatment are necessary. Hospitals, doctors, nurses, policy-makers and the public all need to be more aware of the benefits of treatment.

The 2010 World Health Assembly called on WHO to collaborate with Member States to improve prevention and control of viral hepatitis. This year (2014), the Executive Board drafted a resolution to accelerate concerted efforts towards developing strategies for the prevention, diagnosis and treatment of viral hepatitis with time-bound goals. The strategy will be presented to the 2014 World Health Assembly in May.

By the 2015 Regional Committee meeting, the Region will propose a resolution on the prevention and management of viral hepatitis for consideration by Member States. However, high-burden countries such as China, which has the technology and infrastructure to prevent and treat hepatitis, should be empowered to begin implementation immediately. Dr Shin requested that the Informal Working Group ("Hepatitis Expert Working Group") provide a framework for the prevention and management of viral hepatitis in the Region. He thanked the Working Group and expressed appreciation for the support provided by the ZeShan Foundation and United States Centers for Disease Control and Prevention (US CDC).

2. PROCEEDINGS

2.1 Objectives, expected outcomes and role of the Hepatitis Expert Working Group

Dr Ying-Ru Lo summarized the goal and specific objectives of the meeting of the Hepatitis Expert Working Group (HEWG), along with the timeline of key events for the prevention and

management of viral hepatitis in the Region, and WHO Secretariat activities for the next three years (2014–2016).

After the meeting of the Hepatitis Expert Working Group, an outline for the regional priority action plan (“the Regional Plan”) for improving awareness, surveillance, prevention and management of viral hepatitis will be developed by mid-2014 and circulated for feedback. By early 2015, the Regional Plan should be developed so that Member States can review and finalize it along with the Strategic and Technical Advisory Group (STAG), which will be convened to meet in spring 2015 to finalize the regional priority action plan for viral hepatitis, draft a resolution for the prevention and management of viral hepatitis, and propose a budget for the Secretariat. By the end of 2015, it is expected that the Regional Plan will be endorsed, as will the resolution on viral hepatitis control by the Sixty-sixth WHO Regional Committee. The goal will be to have the Regional Plan implemented by the end of 2016, with ongoing monitoring. Lessons learned from HIV will be used to establish a public health approach to viral hepatitis.

Dr Lo also outlined the following accomplishments by the Regional Office: (1) mobilization of resources for two medical officers (viral hepatitis), one full-time in the Regional Office and the other part-time in China for 3 years; and (2) an initial stakeholders’ meeting on viral hepatitis held between the Chinese government, WHO, China CDC and US CDC in February 2014.

2.2 Update on the Global Hepatitis Programme: where are we today?

Dr Lo provided an overview of the epidemiology of viral hepatitis, and global and regional actions, including a potential future approach in the Western Pacific Region.

Viral hepatitis is among the top five leading causes of infectious disease deaths worldwide. Compared with other geographical regions, the Asia–Pacific region has the largest number of viral hepatitis-related deaths per year, exceeding those related to HIV, tuberculosis and malaria. Further, the Asia–Pacific region accounts for approximately 77% of global deaths related to HBV infection. Within the Asia–Pacific region, the highest percentage of hepatitis-related deaths is attributable to HBV (60%), followed by HCV (27%), acute hepatitis A (8%) and hepatitis E (5%).

The four axes of the WHO Global Hepatitis Framework provide a structured approach to prevention and control activities for viral hepatitis. These activities in the Region need such an approach to address all aspects of control, including awareness, surveillance, prevention and management for all hepatitis viruses (A–E). The Region has been the leader in HBV elimination through immunization. A broader approach will probably involve defining the burden of disease in each country; determining gaps in awareness, surveillance, prevention and management, including access to care and treatment; and then conducting activities to address these gaps.

As a way forward, the Hepatitis Expert Working Group should help the Regional Office prepare the Regional Plan and guide countries towards an approach to improving awareness, surveillance, prevention and management of viral hepatitis. Countries in the Region should work together, learn from each others’ experiences, and share resources (e.g. investment cases, laboratory).

2.3 Feedback from the Global Strategic Advisory Group and Partners Meeting on Viral Hepatitis and implications for the Western Pacific Region

The purpose of this presentation was to provide an update from the inaugural Strategic and Technical Advisory Committee (STAC) meeting that took place in Geneva on 24–26 March 2014. Twenty-four viral hepatitis experts and members of civil society organizations active in conducting advocacy for hepatitis were invited by the WHO Director-General to serve as members of the STAC for viral hepatitis. The objectives of STAC were to provide the Director-General with an independent evaluation of WHO’s work on viral hepatitis; advise on existing WHO policies and strategies; and recommend key priority areas for action to help promote a coordinated global response to viral

hepatitis. Topics under each axis were covered, with a focus on preventive measures associated with health care and injection drug use as well as immunization, to reduce transmission (Axis 2), and on treatment expansion and access (Axis 4). Recommendations from the STAC meeting are still being vetted. The following WHO priority actions are under consideration to improve surveillance for, and prevention and treatment of, viral hepatitis: (i) develop tools (e.g. software for data collection) and a methodology for viral hepatitis surveillance; (ii) develop a system that would allow for regular reporting on the status of the viral hepatitis response; (iii) promote immunization of health-care workers and establish targets for coverage with vaccination; (iv) improve advocacy for blood safety; (v) promote and implement the new global injection safety campaign; (vi) integrate, expand and link hepatitis programmes and services targeting people who inject drugs (PWID) with other health programmes and services (e.g. HIV, tuberculosis); (vii) set targets to ensure full implementation of the existing recommendations for hepatitis B vaccination and delivery of a timely birth dose; and (viii) develop and disseminate treatment guidelines for HBV and HCV infection.

To strengthen national viral hepatitis plans, WHO will collaborate with ministries of health in conducting an analysis of national policies, establishing national goals, developing monitoring indicators and drafting national strategies, and linking them to the national health plan, with ongoing support for implementation.

2.4 Update on the World Health Assembly resolution on viral hepatitis

To enhance understanding of the global framework in which the Region operates, this presentation provided information on the events leading up to the proposal of the draft resolution of the Sixty-seventh World Health Assembly. Because of the high burden of viral hepatitis in the Region, the need for greater involvement of countries in the process was highlighted. The Regional Office staff and others were encouraged to convey to Member States through WHO country offices the importance of speaking out at the Assembly and supporting the resolution. The following upcoming advocacy activities by the World Hepatitis Alliance were described:

- (i) Encourage as many Member States as possible to intervene during the Assembly to send a clear message to WHO in support of the STAC-HEP regarding the prioritization of hepatitis.
- (ii) Engage with global funders after the resolution.
- (iii) Promote the resolution as part of cancer prevention.
- (iv) Discuss with Member States the inclusion of hepatitis in the post-2015 agenda.
- (v) Organize Member States to sign a letter to the Director-General requesting inclusion of hepatitis in the title of both the department of HIV and cluster HIV, TB, Malaria and Neglected Tropical Diseases at WHO Headquarters.

2.5 Axis 1: Raising awareness, promoting partnerships and mobilizing resources

2.5.1 Public-private partnerships and catalytic philanthropy

Established in Hong Kong in 2004, ZeShan is a privately funded foundation with a mission to improve the lives of the less privileged in the world through philanthropy. ZeShan's endeavours are underpinned by three guiding principles: strategic and engaged philanthropy, effective and equitable partnerships, and deep and lasting impact. The Foundation has five mandates: public health, education, promoting strategic philanthropy, human services in Hong Kong, and disaster relief and community rebuilding. To maximize the impact of its initiatives, ZeShan creates synergies and leverages opportunities with funders and organizations dedicated to causes that the Foundation supports.

In response to the growing burden of hepatitis B infection and the inadequate attention to it, in 2006, ZeShan made effective control and eventual elimination of hepatitis B a long-term strategic goal. Since 2006, the Foundation has adopted a proactive, multipronged approach to addressing hepatitis B, and has supported 13 projects in the areas of hepatitis B vaccination, education and media advocacy, and prevention of mother-to-child transmission (PMTCT) of HIV and hepatitis B. ZeShan's main role has been to serve as a catalyst and change agent through supporting the work of WHO and country governments. For example, by supporting the effort of the Government of China to provide catch-up vaccination, children less than 5 years of age have an HBsAg prevalence of below 1% in China. Other achievements in China include development of the first documentary film on hepatitis B to raise awareness, and development of a national programme on integrated prevention of mother-to-child transmission. ZeShan is in a good position to convince other organizations to provide funds to support hepatitis control. Demonstrating impact is important to attract like-minded funders.

2.5.2 Building partnerships and creating a national action plan for viral hepatitis in the Philippines: issues and challenges

The Philippines has a population of 92 million (2010 Census). Based on a serosurvey of 2150 randomly selected adults (aged 20 years and above) participating in the National Nutrition and Health Survey in 2003, the prevalence of HBV infection was estimated to be 16.7%. HBV accounts for approximately 67% of liver cancer, which is the second leading cause of cancer-related deaths in the country. The burden of disease from the other hepatitis viruses (A, C, D, E) is unknown, although the burden of hepatitis C is estimated to be high in certain subpopulations such as people who inject drugs. The Philippines does not yet have a comprehensive programme that is endorsed by the Ministry of Health for the prevention and control of viral hepatitis. While there are laws on infant HBV vaccination, the country has seen a drop in timely birth dose (about 38% in 2012, WHO data). Lack of public awareness about risk factors, prevention and treatment hinders testing and treatment for chronic HBV and HCV infection. Further, social stigma and discrimination by employers, such that infected persons are considered “unfit” to work, results in unwillingness to get tested or seek treatment. Lack of awareness by providers and policy-makers are additional challenges to hepatitis control; World Hepatitis Day activities to raise awareness are largely conducted through civil society groups..

In response to the need for organizing a multisectoral private–public coalition to address viral hepatitis in the Philippines, in 2012, the Hepatology Society of the Philippines convened a coalition composed of representatives from the Department of Health, WHO, Occupational Safety and Health Centre, PhilHealth (national health insurance programme), professional societies and patient organizations to develop a “road map” or a national action plan within the Global Hepatitis Programme Framework. The finalized plan was presented on 20 November 2013 at a meeting attended by the media and government officials. However, the endorsement of the action plan by the government is pending. Meanwhile, finding resources to increase access to services for prevention and control activities is challenging. As efforts to engage government organizations are ongoing, segments of the action plan that can be implemented by the members of the coalition will be put into action. Some activities that have already been initiated include submission and approval of a bill to address discrimination of those with hepatitis B in the workplace, campaigns on public information and education of health-care providers and policy-makers, gathering of data to assess burden, renewed efforts to improve infant vaccination rates, and inclusion of outpatient services for viral hepatitis in PhilHealth.

2.6 Axis 2: Evidence-based policy and data for action

2.6.1 Overview of hepatitis surveillance

This presentation provided an overview of the objectives of surveillance, data sources, and potential surveillance priorities, activities and approach for resource-limited settings.

Surveillance can be conducted for either acute or chronic disease or both. The main objectives of surveillance for acute disease are to monitor trends in incidence, assess sources of infection and monitor changes in transmission patterns, and identify outbreaks. The objective of surveillance for chronic disease is to assess the burden of disease (e.g. morbidity, mortality and health system impact). Surveillance for both acute and chronic disease can additionally identify at-risk contacts for intervention, and evaluate and guide prevention and treatment efforts.

Potential sources of data for surveillance include outpatient and inpatient hospital records, blood banks, serological surveys and special studies, liver failure and transplantation records, cancer registries, vital statistics, laboratory data and pharmaceutical consumption data.

Several examples of utilization of surveillance data and systems in different countries were provided. For example, jaundice surveillance in Uganda identified a high incidence of hepatitis E infection, and sentinel surveillance data from Pakistan identified receipt of medical injections as an important risk factor among reported hepatitis B and C cases. In the United States, analysis of serological surveillance data identified a higher prevalence of hepatitis C among persons born during 1945–1965, resulting in broadening of the national HCV screening recommendations.

Some suggested priority surveillance activities for consideration include conducting sentinel surveillance for acute hepatitis, screening special populations at risk (e.g. prisoners, people who inject drugs), and conducting surveillance at antenatal clinics and during national serosurveys (and special studies) to assess the contribution of viral hepatitis to the burden of cirrhosis, liver cancer and mortality. Other surveillance activities may include assessing the impact of hepatitis on the health-care system, monitoring prevention efforts, and the effectiveness of care and treatment are other surveillance activities. Suggested first steps include identifying gaps in knowledge and utilizing existing/available data. Integrating surveillance for hepatitis with existing surveillance programmes, such as HIV surveillance, may be cost efficient. Surveillance activities should be included in the national hepatitis control action plans and strategies.

2.6.2 Hepatitis A and E surveillance and outbreak response

This presentation provided an overview of the basic principles of surveillance, and key issues for hepatitis A and E surveillance.

Viral hepatitis is caused by five types of viruses (named A–E) with different clinical manifestations and epidemiology. These can present challenges to surveillance, prevention and control. Of the five types of viral hepatitis, hepatitis A and hepatitis E share many similarities. For example, both viruses are transmitted through the fecal–oral route and vertical transmission does not take place. The two viruses also have differences: person-to-person transmission is common for hepatitis A but rare for hepatitis E; the severity of disease increases with age for hepatitis A infection, whereas hepatitis E infection mainly causes severe disease in pregnant women. Hepatitis A and E are both associated with poor hygienic conditions related to poverty; however, hepatitis E is seen mainly in South Asia and Africa, whereas hepatitis A is more widespread globally.

There are six principles in surveillance for hepatitis A and E (the same principles are generally applicable to surveillance for other types of hepatitis viruses):

- (1) Clear objectives that focus on informing public health actions;
- (2) High-quality laboratory support to diagnose different types of viral hepatitis. Laboratories must have the essential equipment and reagents, standardized algorithms and protocols, and quality assurance;
- (3) Standardized case definitions that are unambiguous and easy to use. Case definitions should balance simplicity versus accuracy, and flexibility versus comparability;

- (4) Astute clinicians with up-to-date knowledge about viral hepatitis to diagnose and report infections. Clinicians should understand the basic principles of public health, and should be willing to order appropriate tests to differentiate between hepatitis of various types;
- (5) Collection of surveillance data that address surveillance objectives, with ongoing and regular data analysis and dissemination of results to inform public health actions;
- (6) Feedback mechanism to foster regular, two-way communication. The data must be disseminated to end-users, including public health professionals, to enable public health action. In turn, the system should allow end-users to give feedback for evaluation and improvement of the surveillance system;

2.6.3 Strategies for viral hepatitis surveillance and building laboratory testing capacity for hepatitis surveillance in Viet Nam

Based on several sero-epidemiological studies, the estimated prevalence of HBV and HCV infection in Viet Nam is, respectively, 10–25% and 0.4–4.1%. Hepatitis B accounts for 80% of viral hepatitis cases based on laboratory records at Viet Nam’s referral hospitals. To strengthen prevention and control activities, a recently established national consultative working group facilitated the development of HCV treatment guidelines; improved incorporation of immunization against HBV in the Expanded Programme on Immunization (EPI); and facilitated the conduct of sentinel surveillance for HBV and HCV through integrated behavioural and biological surveillance.

Viral hepatitis infection is included in the national notifiable disease surveillance system, which collects data on the monthly aggregate number of cases and deaths related to viral hepatitis by province and region. However, reporting is based on clinical diagnosis only: standardized case definitions and laboratory tests to distinguish between the various hepatitis viruses are absent, and case-level data are not collected.

The strengths of laboratory testing are as follows: (i) available laboratories at the central and regional levels with the capacity to run most tests for viral hepatitis; (ii) established screening of blood for HBV and HCV at certain laboratories; (iii) requirement of registration for test kits and equipment; and (iv) recently approved biosafety guidelines. However, many gaps still exist. For instance, there are no guidelines for testing and use of test kits, no systems are in place for external and internal quality assessment (EQA/IQA), there is no functioning national reference laboratory, and there is inadequate laboratory capacity at the provincial and district levels. Further, the HBsAg and HCV antibody (anti-HCV) assays in use have not been validated. Rapid tests are primarily used at the district hospitals.

Based on the WHO Framework for Global Action, the Ministry of Health developed a National Action Plan (2014–2018) to address some of these gaps in surveillance and laboratory testing. The Action Plan calls for the development of surveillance guidelines that include virus-specific case definitions and mechanisms for information exchange between stakeholders. The National Action Plan also proposes activities to enhance laboratory testing and improve quality control at all levels, including the development of standard operating procedures, standardized tests and reference laboratories.

2.6.4 Building a laboratory network

The Region has established a laboratory network of over 400 public health laboratories for the laboratory diagnosis of diseases covered by EPI, such as poliomyelitis, measles, rubella, Japanese encephalitis, rotavirus and bacterial meningitis. In 2010, the Region designated the Victorian Infectious Diseases Reference Laboratory (VIDRL) as a WHO regional reference laboratory to support verification of hepatitis B control in the Region. Establishing laboratory capacity to test all types of viral hepatitis, including hepatitis B and C, through the laboratory network was discussed. The experience gained from EPI in building and coordinating laboratory networks and implementing quality assurance mechanisms could be used to establish a viral hepatitis laboratory network in this Region, once the funding source is identified. Given the experience of the laboratories network in testing for other pathogens, it could play an important role in the following ways:

- (1) Evaluate available kits for diagnosing viral hepatitis.
- (2) Develop the WHO manual or guideline for the laboratory diagnosis of viral hepatitis.
- (3) Coordinate networking between WHO global specialized, regional reference and national/subnational laboratories.
- (4) Provide training opportunities for the network laboratories, and establish the quality assurance programme and assessment/accreditation.

Dr Cowie provided an overview of the VIDRL via WebEx. The Region has relied on seroprevalence surveys to validate achievement of immunization goals as the Region lacks laboratory networks or centres of expertise to support the process. To address this gap, the VIDRL was designated as a WHO regional reference laboratory in 2010. Based on the terms of reference, VIDRL will be providing (i) technical support for HBV serosurveys, including confirmatory testing and quality assurance; (ii) general technical laboratory support by serving as a resource for HBV diagnostics and surveillance; (iii) support for research, for example, in areas of modelling and molecular epidemiology; and (iv) laboratory training.

The establishment of VIDRL as a reference laboratory presents multiple opportunities in the Region, such as laboratory capacity building at all levels (subnational, national and regional); improving partnerships in training and exchange of technical knowledge; integrating local capacity building with quality assurance and reference functions (e.g. in serology testing, molecular analysis, antiviral resistance, epitope mapping); and in resource development (e.g. HBV laboratory manuals).

At the same time, there are potential challenges and obstacles related to limited resources to build capacity at both the subnational and national levels, conduct quality assurance and reference functions, and coordinate laboratory network functions. Striking a balance between diagnostics and routine surveillance will be another challenge.

Relationships with existing and proposed partners and networks (i.e. how a regional laboratory would work with, or relate to, existing activities) pose both opportunities and challenges.

2.6.5 Results of the regional laboratory gap analysis

This session described the preliminary findings of an analysis conducted by the Regional Office to identify gaps in HCV, HBV, HIV and syphilis testing and infrastructure in laboratories in seven countries of the Region.

The National Reference Laboratory, St Vincent's Institute of Medical Research, Fitzroy, Victoria, was established in 1985 as part of the Australian Government's HIV/AIDS strategy and is a designated WHO Collaborating Centre. It was contracted to develop and administer a laboratory

assessment tool. The tool consisted of two Microsoft Excel questionnaires administered electronically. The Systems Questionnaire collected information about the presence of government or national-level support in the areas of coordination of laboratory activities; licensing of laboratories; management of test kits; national standards; quality management systems and their assessments; external quality assessment schemes (EQAS); and staff, education and training. The Testing Questionnaire collected information about the types of tests being conducted in the country and how they were being used.

The two questionnaires were distributed to seven countries (Cambodia, Fiji, Lao People's Democratic Republic, Mongolia, Philippines, Papua New Guinea and Viet Nam) in February 2014; of these, the first six countries provided a response.

An analysis of the two questionnaires showed that HCV and HBV testing laboratories had fewer systems in place to support assessed activities than did HIV and syphilis testing laboratories. Three countries (Cambodia, Lao People's Democratic Republic and Papua New Guinea) had almost no systems in place. Systems that were not in place or only partially in place in most surveyed countries included EQAS, licensing of laboratories, quality management systems and management of test kits. Most laboratories reported results based on a single anti-HCV or HBsAg test, and few undertook confirmatory testing. None of the laboratories in the six countries performed the HCV RNA test for confirmation of the diagnosis. Many laboratories in countries had no national testing algorithm.

Laboratories in all the six countries experienced difficulties in maintaining appropriate stocks of test kits, with stock-outs occurring more frequently among "not-for-profit" than among "for-profit" laboratories.

2.6.6 Foundation Mérieux's experience: building laboratory capacity and increasing hepatitis awareness in resource-limited settings

Established in 1967, Fondation Mérieux is an independent family foundation and charity with the mission of strengthening local capacities in developing countries to reduce the impact of infectious diseases in vulnerable populations. The foundation has three main focus areas: (i) strengthen local applied research capacities for more accurate and timely identification of infectious diseases, by creating and equipping laboratories to modernize local health structure; (ii) improve the quality and accessibility of biological diagnoses for vulnerable populations to ensure appropriate care; and (iii) promote information exchange among public health stakeholders to enhance knowledge in infectious diseases and foster innovation by holding health professional trainings. The Foundation has a presence in at least 13 countries worldwide.

Fondation Mérieux promotes the development of laboratory networks by following the examples of: (i) the Global Approach to Biological Research, Infectious diseases and Epidemics in Low-income countries (GABRIEL), a laboratory network primarily for diagnostics for respiratory infectious diseases and tuberculosis; and (ii) Reinforcing Access and Quality of Biological Diagnosis in West Africa (RESAOLAB), which links seven countries in West Africa (Benin, Burkina Faso, Guinea, Mali, Niger, Senegal, Togo), to enhance capability in laboratory diagnosis.

In Lao People's Democratic Republic, several workshops were held during 2010–2013 to improve HBV and HCV testing among providers. These were conducted in collaboration with the Centre d'Infectiologie Christophe Mérieux, a public health centre based in Vientiane. In addition, laboratory capacity to test for viral serologies and nucleic acid was developed. The impact of these activities was demonstrated through a steady increase in the number of samples received in laboratories for HBV DNA and HCV RNA tests. Potential opportunities to improve provider knowledge in appropriate treatment regimens were discovered through data collected on treatment regimens.

In Thailand, the Foundation has collaborated with the Program for HIV Prevention and Treatment to expand capacity for preventing and controlling hepatitis C and B in South-East Asia through the development of two programmes: (i) a programme for maternal antiviral prophylaxis to prevent perinatal transmission of HBV in Thailand, a study to investigate the efficacy of tenofovir in preventing HBV transmission through a randomized controlled trial of 328 women and their infants at 17 sites in Thailand; and (ii) a prospective, observational, multicentre, cohort HCV treatment study.

2.6.6 National Center for Global Health and Medicine's role in assisting with surveillance activities: the example of Lao People's Democratic Republic

The National Center for Global Health and Medicine is a highly specialized medical research centre that promotes high-grade comprehensive medical care as well as research with partners (e.g. WHO, ministry of health). It comprises general hospitals, a research institute, including the centre for hepatitis and immunology, and a bureau of international medical cooperation.

Hepatitis B is regarded as a serious public health issue in Lao People's Democratic Republic; however, the prevalence of HBsAg in the general population is not known. A nationwide cross-sectional survey for HBsAg prevalence in children and their mothers was conducted during 2011–2012.

By applying probability sampling, 965 child (5–9 years old) and mother (15–45 years old) pairs were randomly selected from 48 villages throughout the country. In total, 17 children and 27 mothers were HBsAg-positive (using the Determine[®] rapid test). HBsAg prevalence was estimated to be 1.7% (95% confidence interval: 0.8–2.6%) in children, and 2.9% (95% confidence interval: 1.7–4.2%) in their mothers after taking the sampling design and weight of each sample into account.

Despite slow implementation of the hepatitis B vaccination programme, HBsAg prevalence among children and their mothers was lower in Lao People's Democratic Republic compared with that in neighbouring countries. To understand the reasons for this difference in HBsAg prevalence and epidemiology of HBV infection, seroprevalence surveys should be conducted in populations born before and after the implementation of a hepatitis B vaccination programme.

The Center's other areas of work in Lao People's Democratic Republic include maternal, neonatal and child health, sectorwide coordination in health, and nursing and midwifery regulations. Recently, collaboration with the Pasteur Institute of Lao People's Democratic Republic was started for research in malaria.

2.7 Axis 3: Prevention of transmission

2.7.1 Prevention of hepatitis through vaccination

Vaccines have been developed and are available for hepatitis A and B, while a hepatitis E vaccine has been developed in China but is not WHO prequalified and not widely available. WHO recommends universal hepatitis B vaccination for infants (at birth and two or three doses) and vaccination of groups at high risk of infection such as health-care workers and key populations (men who have sex with men, PWID and sex workers). WHO recommends hepatitis A and B vaccination for anyone with chronic liver disease, and recommends universal hepatitis A infant vaccination, depending on incidence and cost considerations. WHO has formed a working group to review the issues for the hepatitis E vaccine but no recommended strategies have been formulated to date.

Hepatitis B disproportionately affects the Western Pacific Region, which accounts for over 50% of global deaths. Vaccination coverage is increasing in the Region and overall regional vaccination coverage in 2012 was 91% for all three doses of hepatitis B vaccine, and 76% for the birth dose. This high immunization coverage has led to a dramatic reduction in the prevalence of chronic hepatitis B infection among children. In 2013, the Western Pacific Region adopted the goal of

reducing the seroprevalence among 5-year-olds to less than 1% by 2017, with coverage targets of 95% for the birth dose and three doses of hepatitis B vaccine nationally, and 85% in all districts. Some countries continue to have low birth dose coverage. As of December 2013, 11 countries have been verified as having achieved the goal of less than 1% prevalence, five countries are ready for verification, 13 countries are planning serosurveys in the next two years, and seven countries require programme improvements in order to meet the 1% goal. Of 37 countries and areas in the Region, 17 (46%) have a policy on vaccinating health-care workers.

Hepatitis A is responsible for 103 000 deaths annually, with high infection rates in Asia. The disease is usually asymptomatic among children and case fatality rates increase with age. China has already introduced hepatitis A vaccination. As sanitation improves in the region and transmission among children decreases, the importance of hepatitis A vaccination will increase. Hepatitis E is responsible for 56 000 deaths annually with highest incidence of hepatitis E in East and South Asia. The case fatality rate is high (10–40%) among pregnant women. In 2011, China licensed the first hepatitis E vaccine. The earliest the vaccine will be available outside China would be 2020.

2.7.2 Prevention of mother-to-child-transmission of hepatitis B: ongoing clinical trials and potential implications for national guidelines and public health policies

Since the introduction of hepatitis B vaccine in the Republic of Korea in 1982, the overall prevalence of HBsAg in the adult population has declined from 7.3% in the pre-vaccination era to 3.0% in 2011. This decline is attributed in part to policies to facilitate immunization.

In the early 1980s, the Republic of Korea developed a domestic hepatitis B vaccine. The government has recommended hepatitis B vaccination for high-risk groups since 1985, and for all newborns since 1995, as a part of the national immunization programme.

In 2002, the national “Hepatitis B Perinatal Transmission Prevention Program (HBPTPP)” was implemented. As part of this programme, infants born to HBsAg-positive mothers receive hepatitis B immune globulin (HBIG), three doses of hepatitis B vaccine, and testing for HBsAg and anti-HBs free of cost. Based on an evaluation of this programme, among 69 999 children enrolled in the HBPTPP during 2002–2010 with available follow-up serological test results, the prophylaxis failure rate was 3.1%.

Published data on the failure of perinatal prophylaxis have found a potential role of human leukocyte antigen (HLA) or the cytokine gene, the presence of surface gene variants (such as G145R) in the hepatitis B virus and maternal HBV DNA level. Several antiviral drugs (such as lamivudine, tenofovir, telbivudine) have been shown to be effective in reducing mother-to-child transmission of HBV.

In the Republic of Korea, an estimated 15 000 neonates per year are exposed to hepatitis B at birth. Assuming a perinatal prophylaxis failure rate of 3%, 500 neonates are infected each year and, of these, an estimated 90% will become chronically infected. An ongoing clinical study funded by the government is evaluating the efficacy and safety of administering telbivudine during the third trimester of pregnancy; the study shows promising results and the data are likely to lead to a policy change with the addition of antivirals to the HBPTPP.

Future areas of study in preventing mother-to-child transmission of HBV include determining the threshold of maternal serum HBV DNA level for initiating antiviral therapy, optimal choice of antiviral agents, cost-effectiveness of therapy, optimal time to start (28 or 32 weeks) and end treatment (just after delivery, postpartum week 4 or 12), and role of breast milk in transmission.

2.7.3 Hepatitis C prevention and lessons learnt from Australia for safe injections and harm reduction

Although the major burden of HCV disease is in people who previously injected drugs, people who currently inject drugs drive HCV transmission. This presentation provided an overview of strategies to prevent transmission based on recent studies in Australia.

The literature provides limited evidence that behavioural counselling and peer education interventions alone reduce HCV transmission among PWID. However, a recently completed study from Australia (in press) suggests that disclosure of HCV status reduced the frequency of injecting among a cohort of PWID followed for 5 years (since 2006). Participants underwent face-to-face interviews and HCV testing at three-month intervals, with pre- and post-test counselling. Analysis of collected data found that while diagnosis and counselling did not significantly impact needle and syringe borrowing or the number of injecting partners, the frequency of injecting heroin steadily declined over time among persons who were HCV-infected. Although further larger studies are needed, the data from this study support the development of a policy around HCV testing of PWID to reduce transmission.

Modelling data suggest that treatment can reduce the prevalence of HCV infection among PWID. However, because treatment is still expensive, additional strategies are needed to reduce prevalence. A modelling study using the social network data of PWID was presented. The study showed that HCV incidence increases as the number of injecting partners increases; each additional network partner increased the incidence rate by 6.9 infections per 100 person-years. Treating 15 contacts per 1000 PWID per year led to an HCV infection prevalence of 350 per 1000 PWID, representing a 30% reduction in prevalence (from 500 cases per 1000 PWID) if no treatment was given. The strategy of treating friends of infected persons was the most effective in reducing prevalence compared with other explored strategies (prioritizing treatment of closest contacts) e..

Thus, developing policies to improve HCV testing and treatment of infected persons and their infected friends with antiviral medications are some effective harm reduction strategies to reduce HCV transmission among PWID. Because of increasing evidence that high coverage (close to 100%) of opioid substitution therapy and needle and syringe programmes can reduce the risk of infection, these two programmes should also be considered among harm reduction strategies, as work continues toward cost reduction of and improved access to HCV medications.

2.7.4 Prevention of hepatitis B in Mongolia: vaccination implementation success

Based on seroprevalence studies, an estimated 10–17% of Mongolia's population of 2.9 million people are chronically infected with HBV. Hepatitis B immunization was introduced in the EPI in 1991, after which the incidence of HBV infection declined steadily, from 134 cases in the 1960s to 5 cases per 10 000 persons in 2013. However, the burden of cases with chronic hepatitis B is still high among persons born before 1990 and among health-care workers who handle blood and blood products. Health-care workers are not universally vaccinated but are vaccinated based on a high risk of exposure. Approximately 45% of health-care workers have been vaccinated during the past three years. The prevalence of HCV infection general population is estimated to be about 10% and increasing.

Mongolia's National Strategy on Combating Viral Hepatitis was approved in 2010 by order of the Minister of Health. The three objectives of the plan are: (i) to introduce vaccination against viral hepatitis A in a phased manner; (ii) to control viral hepatitis B and C, and decrease the HBsAg carrier rate to 2% among children below 5 years of age; and (iii) to strengthen capacity for surveillance, control and laboratory diagnosis of viral hepatitis. The established targets include increasing hepatitis A vaccination coverage from 0 to 90% and hepatitis B birth dose from 92% to 97%, during 2009–2015.

As a result of implementation of the national strategy in 2010, Mongolia was certified as a country that had achieved the Regional goals for viral hepatitis B control. The last nationwide survey conducted in 2009–2010, showed an HBsAg prevalence of 0.53% among children aged 4–6 years. In 2013, vaccination coverage of the birth dose is estimated to be 96.7% and for three doses 98.0%.

Mongolia's future activities in the area of prevention and control of viral hepatitis will be ensuring the financial sustainability of vaccination; expanding treatment coverage of chronic hepatitis B and C through the establishment of regional diagnostic and treatment centres; testing for antibodies to hepatitis B core antigen (anti-HBc) as well as HBsAg; developing a policy on safety of medical injections and risk reduction among health-care workers; screening for HBsAg and hepatitis B e antigen (HBeAg) in antenatal clinics; providing HBV vaccination to infants born to HBsAg-positive women with concomitant administration of HBIG where indicated; and genotyping of HBV and HCV.

2.8 Axis 4: Screening, care and treatment

2.8.1 Hepatitis C virus care and treatment cascade, United States

During 1999–2007, HCV-related deaths in the US doubled to more than 15 000 per year; without intervention, the mortality is predicted to grow. Cohort studies of approximately 3–4 million chronically infected people show that only an estimated 50% are tested, 11% are treated and 6% achieve virological cure.

The presentation provided an overview of the following measures taken by CDC to improve the HCV care cascade in the US:

- (1) Broaden HCV testing recommendations: because persons belonging to the 1945–1965 birth cohort have a five times higher prevalence of anti-HCV than adults born in other years and account for approximately three fourths of all cases and HCV-related deaths, since 2012, national testing recommendations have been expanded. Testing should not only be offered to persons at risk but also all persons born during 1945–1965 (without ascertaining risk).
- (2) Education of communities and providers: to raise awareness of the new HCV testing recommendations, CDC launched a multimedia campaign in 2012 called Know More Hepatitis. As part of this campaign, Twitter and airport dioramas were used.
- (3) Simplified laboratory testing algorithm: to improve uptake of testing and emphasize the importance of HCV RNA testing to diagnose chronic infection, CDC released a simplified HCV testing algorithm in June 2013.
- (4) Building capacity for testing and care: since September 2012, CDC has funded 20 sites serving populations at risk for HCV infection to build capacity and understand best practices.
- (5) Developing and expanding effective care models: CDC funded two states to implement Project ECHO (Extension for Community Health care Outcomes), a model proven to expand clinician capacity in HCV management in underserved areas, through case-based learning and sharing of "best practices" via videoconferencing.
- (6) Updating hepatitis C treatment guidelines: given advances in HCV treatment, CDC collaborated with the Infectious Diseases Society of America and the American Association for Study of Liver Disease to release "Recommendations for testing, managing, and treating HCV" (www.hevguidelines.org).

- (7) Leveraging policy: as the quality of provider care is incentivized under the health-care reform, CDC is working to develop electronic performance measures for HCV testing and management, and clinician decision support tools for incorporation into electronic medical records.

2.8.2 Consensus cost-effectiveness model for treatment of chronic hepatitis B in Asia-Pacific countries

On behalf of the Asian Pacific Association for the Study of the Liver (APASL) Hepatitis B Cost-effectiveness Working Group, Dr John Wong presented the APASL Consensus cost-effectiveness model for treatment of chronic hepatitis B in Asia Pacific countries. The cost of antiviral medications represents a major barrier for most Asian countries because of their low-to-intermediate gross domestic product per capita. As per the 2012 APASL hepatitis B guidelines, "Cost-effectiveness of drug therapy is specific for each country and should be studied independently." Thus, this APASL Working Group sought to assess the cost-effectiveness of alternative antiviral treatment for different Asian countries, given country-specific drug availability, drug costs and affordability based on per capita gross domestic product. The decision analysis considered alternative antiviral drug strategies initially and in sequence for HBeAg-positive 35-year-old and HBeAg-negative 40-year-old patients. Based on WHO criteria for cost-effectiveness and data estimates, the optimal strategy varied among the six countries examined. The results demonstrated the human and economic burden of chronic hepatitis B infection and the importance of country-specific economic resources, clinical practices, and local pricing and reimbursement on optimal health policy-making.

2.8.3 Diagnosis and treatment for hepatitis B and C in China: current status, challenges and opportunities

With the successful implementation of a universal HBV vaccination programme among infants and mandatory screening for anti-HCV among blood donors, the incidence of chronic hepatitis B and C infection has declined dramatically during the past two decades in China. However, the country still has a high burden of chronic hepatitis B and C, with an estimated prevalence of 7.18% for HBsAg and 0.43–1% for anti-HCV. Most infected persons are not aware of their infection and disease status.

The diagnostic facilities and treatment expertise vary greatly across regions, with western and rural areas having a lower capacity than other parts of China. Although most internationally accepted diagnostic reagents and antiviral drugs for HBV and HCV have been approved in China, they are usually not reimbursed or only partially reimbursed due to their high prices. Officially approved generic diagnostic reagents and antiviral drugs are widely used in the clinical management of chronic hepatitis B and C.

Due to the large numbers of infected persons who require treatment combined with the high cost of treatment, only a small proportion of persons with chronic hepatitis B and C are treated. Those who do receive treatment are often prescribed suboptimal antiviral drugs or regimens because of limited reimbursement. For example, although the 2010 update of China's guideline on the management of chronic hepatitis B suggests that drugs with a high potency and high barrier to resistance (such as entecavir) are preferred for therapy, drugs with a lower resistance barrier or lower potency (such as lamivudine and adefovir) are still widely used in some regions, especially in rural areas in China.

National health-care reform and efforts reduce unequal social benefits between urban and rural areas offer great opportunities to address the unmet needs of diagnostics and treatment for HBV and HCV. As already demonstrated in the management of HIV/AIDS, a public health campaign, which includes attention to the need for a massive price reduction of antiviral drugs for HBV and HCV, such as through governmental negotiation, could be successful in preventing and controlling chronic hepatitis B and C.

2.8.4 Systematic review and cost-effectiveness analysis of viral hepatitis B and C treatment

Cost-effectiveness analysis (CEA) is a method used to evaluate the outcomes and costs of interventions designed to improve health. The purpose of a CEA is to help decision-makers determine how to allocate resources. The quality-adjusted life year (QALY) is a measure of the length and quality of life (that is, perfect health) gained from an intervention or treatment. The incremental cost-effectiveness ratio (ICER) is the net increase in the cost of the intervention compared to standard care or no treatment to gain one QALY. WHO defines the threshold value for intervention cost-effectiveness as 1–3x the gross domestic product per capita of a country. For China, the cost-effectiveness threshold ranges between USD 9083 and USD 27 249 (2012).

Recent CEA studies for chronic hepatitis B have focused mainly on monotherapy with entecavir and tenofovir. Cost-effectiveness studies for HCV have mainly focused on the outcome of patients with genotype 1 infection with dual therapy (pegylated interferon [PEG-IFN] + ribavirin). All the studies suggest that treatment versus no treatment is cost-effective. The largest and most impressive gain in QALYs results from treatment for chronic hepatitis B with or without cirrhosis compared to no treatment. The QALYs for no treatment scenarios range from 8.80 to 14.00 and treatment with a low-resistance potent drug range from 15.43 to 19.00.

According to a recent study (in press) that addresses the clinical impact and cost-effectiveness of managing inactive chronic hepatitis B carriers in Shanghai, China, monitoring and treating on activation of chronic hepatitis B is cost-effective. Inactive infection was defined as HBsAg positivity with normal HBV DNA and alanine aminotransferase (ALT) levels, and monitoring entails twice-yearly testing of HBV DNA and ALT levels. In comparison to the current practice (33% of those with active chronic hepatitis B treated, 65% treatment adherence achieved), in Shanghai, the strategy to monitor and treat (35% inactive infections monitored, 33% active chronic hepatitis B treated, 65% treatment adherence) was shown to be cost-effective with an ICER of USD 2996 per QALY gained. If the percentage of inactive infections monitored, active chronic hepatitis B treated and treatment adherence were to all increase to 85%, then the estimated impact of long-term treatment with the low-resistance profile drug would be a reduction in deaths from chronic hepatitis B by 83%, from hepatocellular carcinoma (HCC) by 78% and cirrhosis by 85%. Achieving substantial population-level health gains depends on identifying more cases with chronic hepatitis B in the population, and increasing the rates of treatment, monitoring and treatment adherence.

2.8.5 Determining the cost and cost-effectiveness of hepatitis B and C treatment in China and what additional studies are needed

China has the highest burden of HBV infections worldwide. In 2006, HBsAg prevalence was estimated to be 7.18% (93 million people). This includes an estimated 20 million people with chronic hepatitis B infection. The prevalence of chronic hepatitis C infection is 1.8–3.7% (25–50 million), resulting in China carrying 15–30% of the global burden of HCV infection. China also accounts for approximately 50% of the global burden of HCC and of HCC-related deaths.

The estimated direct medical cost of hepatitis B in 2001 was nearly USD4.3 billion, accounting for 5% of China's total national health expenditure. The average cost of HCV treatment (with PEG-IFN and ribavirin) is USD18 000/patient.

Under urban health-care reimbursement policies, for inpatients, most nucleot(s)ide analogues (except tenofovir) against HBV had been covered by health insurance with 10% co-payment. PEG-IFN and ribavirin are also covered in most parts of China. In a few provinces in the western/southern region, just lamivudine and PEG-IFN-2a are covered for chronic hepatitis B and standard interferon-alpha and ribavirin are covered for chronic hepatitis C. For outpatients, there is a decentralized system for reimbursement; in some areas, such Beijing and Shanghai, self-payment is 10% and different payment schedules apply for the other 90%. Other areas might have a ceiling for insurance reimbursement or a certain deductible amount, and in a few areas, outpatients cannot get

reimbursement for any drug for chronic hepatitis B and chronic hepatitis C. This reimbursement policy possibly leads to more inpatient care for HBV and HCV, raising the cost of care. A recently developed Rural Cooperative Medical System provides coverage for rural settings and different percentages of reimbursement for outpatients, inpatients and severe disease, regardless of the kind of drug. Overall, insurance coverage of antiviral treatment has increased in the past five years; however, improved coverage for outpatients will be key in the future. Government negotiation with pharmaceutical companies, generic drug development and establishing achievable targets are needed strategies.

Since 2011, more and more cost and cost-effectiveness research on the treatment of chronic HBV infection is being conducted in China. Recently, one Markov modelling study showed that for a treatment duration of 5 years and a follow-up period of 30 years, entecavir treatment was cost saving at USD2.69 per day compared with no treatment.

Another study showed that PEG-IFN 2a could prolong 2.19 discounted QALYs and save 15 296 CNY (Chinese Yuan) or USD 2,451 of the total cost per patient compared with conventional IFN.

More cost-effectiveness studies are needed to assess the impact of treatment on the development of cirrhosis and HCC, and impact of screening for different populations.

2.8.6 Increasing access to affordable hepatitis treatment in the Western Pacific Region

The objective of this presentation was to demonstrate that decision-making in the health sector is complex and that decision support frameworks can help.

Given the inherent complexities of the health sector and the fact that many people working within this sector have different definitions for each element of the system, it should come as no surprise that countries and communities find it difficult to come to a consensus about priorities regarding allocation of scant resources. Many countries in the Western Pacific Region are resource poor and face several challenges. At the same time, many are in transition as they undergo health-care reform. Most importantly, offering hepatitis treatment appears to be a daunting task because of the large numbers, cost and complexity of treatment.

The key problem to be addressed is how to get individuals at local, regional, state and national levels of a health system to share common health-care objectives and then act in unison to achieve these objectives – in this case, ensuring equitable access to effective hepatitis treatment. A decision framework is a valuable guide to decision-making and the power of the framework is increased if costs and impact can be quantified. An example of a framework that can inform decision-making is to undertake a *situational analysis* followed by a *gap analysis*. An *option appraisal* can then be undertaken to explore opportunities for moving forward, taking into account the impact and costs. The option appraisal can be informed by other studies such as *budget impact analysis* and *cost consequence analysis*. In the first instance, however, it is important to engage all key stakeholders by making them aware of the social and economic burden of disease associated with hepatitis. It is essential that all key decision-makers are involved in the decision-making process and, where possible, this should include potential funders.

In order to make informed decisions, countries need reliable information such as the economic burden of disease, what services are available to whom and at what cost, how funds flow at the country level (flow of funds from source of funds to providers to implementers), key target groups, diagnosis and treatment options, alternate service delivery models, and the current and potential barriers to access. Some key questions that need to be answered are: can current resources be redistributed such that service models can be adjusted to be more effective and efficient can new services be funded from current resources (government/ donor/health insurance, out of pocket), can hepatitis treatment programmes be integrated into service models of other programmes (such as HIV treatment), can price be reduced (price of drugs, medical costs, hospital admissions) and is it possible

to attract new resources (such as government funds, donor funds, health insurance payments, out-of-pocket payments)?

3. CONCLUSIONS AND RECOMMENDATIONS

3.1 Conclusions

3.1.1 Axis 1: Raising awareness, promoting partnerships and mobilizing resources

In many countries, engaging and gaining the interest of policy-makers is challenging. Key messages from international organizations such as WHO, emphasizing the negative health outcomes of hepatitis (such as cancer and cirrhosis), could help raise awareness among policy-makers. Further, a WHO resolution that addresses price reduction, reimbursement for medicines, treatment coverage (as was done for hepatitis B vaccination) and setting goals could place hepatitis on the agenda of policy-makers. WHO will continue to advocate for nomination of focal points in every country to facilitate a coordinated response to viral hepatitis, which is necessary because activities in the area of viral hepatitis can be fragmented, as responsibilities lie with different sections of ministries of health (e.g. for raising awareness, advocacy, surveillance, immunization, other prevention activities such as infection control and blood safety, and management of persons living with chronic hepatitis).

Raising awareness in the community and among health-care workers to reduce stigma and discrimination, and educate them about the benefits of testing and prevention remains key to hepatitis prevention and management. Inclusion of ambitious targets (such as the "3 by 5" initiative for HIV) and aspirational messages could have a strong impact, as they did for HIV infection.

Advocacy and partnerships to reduce the prices of medications so that treatment is affordable is critical. Countries such as Egypt and Pakistan have been able to negotiate a reduced price for hepatitis C medications. Within health-care systems, partnership between primary care physicians and specialists can increase the capacity to treat.

WHO is unable to finance all the activities necessary for the prevention and control of viral hepatitis; the Hepatitis E Working Group, national governments and other experts from the field need to work together to plan consultations and mobilize resources by exploring existing funding sources (e.g. health insurance, hospital funds) and contacting potential donors. Influential global donors such as the Bill & Melinda Gates Foundation and Clinton Health Access Initiative should be approached to raise awareness about the burden of morbidity and mortality related to viral hepatitis. Data that reflect the burden of disease, cost, effectiveness of treatment and investment cases are needed to mobilize resources. Advocacy groups consisting of hepatitis patients could also play a powerful role in mobilizing resources. Countries that are emerging economies should proactively identify resources for the prevention and management of viral hepatitis.

3.1.2 Axis 2: Evidence-based policy and data for action

The Region should aim to collect standardized surveillance data using uniform (WHO) case definitions among countries. Because resources for surveillance are limited, conducting a situational analysis (with technical support from WHO and CDC) could be the first step to identifying key populations and gaps in surveillance. A survey of surveillance systems in each country could assist in establishing a baseline. Some of the current challenges in surveillance include duplicate reporting, inability to distinguish between acute and chronic hepatitis B and C, inability to distinguish the burden of disease by virus type, and lack of reliable prevalence data in key populations. A surveillance system (e.g. registries) to monitor viral hepatitis-related morbidity (cancer, cirrhosis) and mortality would provide strong evidence for policy development and action. Where cancer registries

already exist, improving linkages to surveillance data is needed to better define the burden of cancer from viral hepatitis.

It is important to develop laboratory capacity in countries so that each has at least one reference laboratory or easy access to a reference laboratory. There is a need for activities that would help to develop standardized methods of testing, ensure quality control for tests, and enable uniform access to standard tests.

3.1.3 Axis 3: Prevention of transmission

Immunization, prevention in health-care settings, ensuring a safe blood supply and harm reduction for PWID are four key areas for the Region's priority action plan for viral hepatitis, based on regional immunization targets, gaps in existing programmes and resources covering these activities, and the burden of disease in certain settings and subpopulations. Although not listed among the Region's new priority activities, efforts to ensure food and water safety as global public goods should continue.

Immunization: challenges exist in understanding the reasons for gaps in birth dose coverage in some countries, and in implementing policy and activities to address these gaps. The Regional Office is working to conduct pilot studies that could help determine which strategies will be the most effective in improving vaccination coverage. The Regional Office is also looking at improving linkages between community workers and health facilities to increase coverage of the birth dose of hepatitis B vaccination, improve linkages between the maternal and child health programme and EPI, and use opportunities to deliver messages about the birth dose at antenatal screening programmes. One possible strategy is to ensure vaccine availability as stock outages continue to be an issue in some countries.

Alongside public health, professional societies (e.g. in infectious diseases or hepatology) could also take a leadership role in HBV vaccination for infants to improve coverage of the birth dose. Partnerships with organizations (e.g. United Nations Children's Fund [UNICEF]) with a common goal of improving vaccination could also be an effective measure.

Investigation of outbreaks of hepatitis B and C could inform prevention measures. Health-care workers remain a high-risk group and universal vaccination of health workers can reduce the burden of disease. Better education and stronger emphasis needs to be placed on safe injection practices, safety in medical procedures and infection control practices.

Harm reduction among PWID requires developing an infrastructure that supports easier access to testing, care and treatment, and clean injecting equipment as well as other harm reduction measures. WHO has published harm reduction guidelines that should be implemented in countries of the Region.

3.1.4 Axis 4: Screening, care and treatment

The prevalence of hepatitis B and C varies in different countries and subpopulations. Identifying key subpopulations and then implementing screening in these groups is a key activity. In some countries, implementing screening in certain settings, for example, hospitals in China, has been a high-yield activity. Screening activities need to be linked to counselling and, ideally, care and treatment programmes. Stigma and lack of access to treatment remain barriers to HBV and HCV testing, and need to be addressed to improve the uptake of screening.

Primary-care providers in most countries are not equipped to treat hepatitis B and C and do not have access to medications. Capacity building among such providers could enhance linkage to care, as would provider education on the need to assess all infected persons for chronic disease and provide treatment. Countries should develop HBV and HCV testing, care and treatment guidelines consistent

with the recently released WHO hepatitis C guidelines and HBV guidelines currently under development. Each country will have its unique barriers to treatment, which should be identified. Partnerships and advocacy to reduce the cost of drugs will be needed. A phased approach towards introducing screening, diagnosis and treatment of hepatitis to determine service delivery models and financing strategies tailored to country-specific health systems could be considered. Some countries may have developed or adapted existing guidelines; an inventory of current guidelines should be undertaken as a first step.

3.2 Recommendations

The following were recommended to be priority activities for inclusion in the regional action plan for viral hepatitis. Of note, these activities were identified as priority based on the following considerations: regional immunization targets, gaps in existing programmes and resources covering these activities, and the burden of disease in certain settings and subpopulations. Although not listed among the Region's new priority activities, efforts to ensure food and water safety as global public goods should continue. Countries should also conduct other viral hepatitis prevention and control activities as recommended by the WHO Global Viral Hepatitis Programme.

3.2.1 Axis 1: Raising awareness, promoting partnerships and mobilizing resources

- (1) Raising awareness about viral hepatitis and its negative health outcomes
 - (a) A multisectoral National Hepatitis Task Force should be constituted, which comprises policy-makers, health-care providers (medical associations or societies), researchers, media, nongovernment organizations, and representatives from affected communities and people living with chronic active hepatitis B and C.
 - (b) Awareness should be raised and stigma and discrimination reduced through high-quality activities conducted on World Hepatitis Day and through activities such as provider training and public service announcements. Development and inclusion of ambitious targets (such as the "3 by 5" initiative for HIV) and aspirational messages should be considered. Development of an education and communication strategy tailored to different target groups such as policy-makers, donors, civil society and the general public will be essential to raise awareness about the importance of testing, care and treatment, and reduce stigma and discrimination as a barrier to testing.
- (2) Developing a policy for viral hepatitis prevention and control
 - (a) Countries should work toward developing a national action plan.
 - (b) Countries should identify a focal point in the ministry of health to coordinate all viral hepatitis-related activities, including the development and implementation of a national action plan that addresses awareness, surveillance, prevention and management of viral hepatitis.
- (3) Mobilize resources for viral hepatitis prevention and control
 - (a) Resources should be made available to conduct a situational analysis of the disease burden (Axis 2) and cost-effectiveness of screening and treatment— data from these analyses will facilitate the development of evidence-based policies and mobilization of resources to improve awareness, surveillance, prevention and management of hepatitis.
 - (b) Programmes for hepatitis should be integrated with HIV programmes to address coinfection and optimize resources. Pilot projects assessing the effectiveness and cost-effectiveness of integrating hepatitis monoinfection programmes into existing HIV control and prevention programmes should be conducted to inform policy.

(c) Through advocacy and partnerships (for example, with the pharmaceutical industry, influential global donors, patient advocacy groups, professional societies and others), opportunities to increase access to affordable hepatitis medications should be explored.

(d) The WHO Country and Regional Office should support countries in raising awareness, especially among policy-makers, for example, through resolutions, communications with ministries of health, and emphasizing on the burden of hepatitis on society (such as cancer and cirrhosis).

3.2.2 Axis 2: Evidence-based policy and data for action

(1) Situational analysis of the burden of disease

(a) Existing data (for example, from blood banks, antenatal clinics) should be identified and used to estimate the disease burden with a focus on hepatitis B and C, but including the burden of hepatitis A, hepatitis D and hepatitis E when appropriate; existing tools could be used to assess disease burden and expert consultation sought (e.g. WHO, US CDC) to conduct analyses. The investment case used for HIV could also be conducted (e.g. basic modelling to inform policy-makers about investment needs to reach the desired outcomes).

(b) Serosurveys should be conducted to estimate the HBsAg and HCV antibody prevalence among the general adult population possibly as part of existing population-based surveys.

(c) Evidence-based epidemiological profiles should be developed to identify high-risk groups.

(d) Gaps in knowledge of the disease burden need to be identified and an operational research agenda to address these gaps developed accordingly.

(e) Capacity of the ministry of health should be enhanced to analyse/understand surveillance data.

(f) A plan or strategy should be formulated for ongoing viral hepatitis surveillance in the country.

(2) Standardized data for surveillance across countries

(a) A reporting system should be developed which requires minimum burden on the reporter but utilizes standard case definitions.

(b) WHO surveillance guidelines (under development) should be adapted to meet the needs of countries in the Region.

(c) A tool kit for surveillance should be developed.

(3) Building laboratory capacity: WHO-designated global, regional and national/subnational laboratories

(a) Where feasible, at least one WHO national reference laboratory should be designated in a country that participates in the WHO accreditation programme.

(b) Available test kits need to be validated and guidance provided (by global and regional laboratories) on testing consistent with WHO manuals/guidelines.

(c) Testing strategies and algorithms need to be developed, for example, for blood banks, surveillance and diagnosis.

(d) A WHO EQAS needs to be established for laboratories in the hepatitis network. National laboratories should also establish an EQA system for local laboratories, including community-based facilities that use rapid tests.

(e) The laboratory's role in public health surveillance and response should be strengthened.

3.2.3 Axis 3: Prevention of transmission

(1) Immunization: More than 95% coverage should be achieved of universal three-dose vaccination of infants, with the first dose given within 24 hours of birth.

(a) Parents in antenatal clinics need to be educated.

(b) Professional societies and providers should take the lead in implementing the birth dose of hepatitis B vaccine.

(c) Partnerships should be built to implement the birth dose (e.g. with UNICEF, the media).

(d) Measures should be taken to reduce stock-outs and shortages.

(e) Outreach should be conducted to vaccinate children born at home with the first dose of hepatitis B vaccine within 24 hours of birth.

(2) Prevention in health-care settings: reduce transmission in health-care settings through strengthening prevention measures

(a) All health-care workers should be vaccinated for HBV (e.g. by vaccinating them while undergoing training).

(b) Outbreaks in health-care settings should be investigated to identify gaps in infection control.

(c) Safe therapeutic injection practices need to be implemented (WHO best practices for injections and related procedures toolkit).²

(d) Implementation of the WHO universal precautions and infection control guidelines should be promoted.

(3) Harm reduction: reduce transmission in people who inject drugs

(a) Infrastructure and service delivery models should be set up to reach PWID to support easier access to hepatitis testing, care and treatment.

(b) Implementation should be promoted of the WHO-recommended harm reduction interventions (2013).³

(c) WHO-recommended HBV catch-up vaccination should be promoted and provision made for the use of low dead-space syringes (2012).⁴

² http://whqlibdoc.who.int/publications/2010/9789241599252_eng.pdf (accessed 14 May 2014).

³ http://www.who.int/hiv/pub/idu/targets_universal_access/en/ (accessed 14 May 2014).

- (4) Blood safety: ensure universal screening of the supply of blood and blood products
 - (a) National screening policies should be developed, which include screening for HBV and HCV in blood and blood products, tissues and organs.
 - (b) A national transfusion service should be developed and integrated into the national health system, with full authority and responsibility to ensure safe blood supply.
 - (c) Quality tracking and monitoring systems need to be developed
 - (d) The WHO Global Strategic Plan (2008–2015) for universal access to safe blood transfusion should be implemented.⁵

3.2.4 Axis 4: Screening, care and treatment

- (1) Screening: identify populations for HBV and HCV screening
 - (a) Existing data should be reviewed to assess the disease burden and identify populations that may be infected with HBV (e.g. children born to women with chronic HBV infection, persons who receive blood products or medical injections, health-care workers) and HCV (e.g. PWID, people who are HIV-positive, persons with multiple sex partners).
 - (b) Studies should be conducted to identify persons at increased risk for infection, with consideration to reducing stigma and discrimination (for example, maintaining confidentiality or conducting anonymous testing, as was done for HIV).
 - (c) Screening needs to be integrated into hospital systems and other settings that serve key populations.
 - (d) Screening for HBV infection (e.g. HBsAg) should be conducted in antenatal health-care delivery settings, and those found to be positive should be referred for management.
- (2) Linkage to care: ensure linkage to counselling and care, and enhance health-care capacity to treat
 - (a) It should be ensured that all those detected with HBV and HCV infection receive counselling and follow up for treatment eligibility.
 - (b) Primary-care providers should be trained to manage HBV and HCV infection.
- (3) Treatment: improve equitable access to quality, safe and affordable HBV and HCV medicines and diagnostics
 - (a) Government-endorsed guidelines should be developed for care and treatment, consistent with WHO guidelines and recommendations.
 - (b) Countries should identify barriers to access to treatment and take action to ensure equitable access to treatment.

⁴ <http://www.who.int/hiv/pub/guidelines/hepatitis/en/> (accessed 14 May 2014).

⁵ <http://www.who.int/bloodsafety/publications/UniversalAccessToSafeBT.pdf> (accessed 14 May 2014).

- (c) Country-specific goals/targets for treatment should be developed.
 - (d) A country-specific analysis should be performed of access to quality care and treatment, and cost-effectiveness and economic analyses conducted on the cost of burden of disease (e.g. HCC, cirrhosis) and treatment.
 - (e) Dialogue with stakeholders should be initiated (e.g. pharmaceutical industry, those responsible for compiling the essential drugs list) to improve treatment access.
 - (f) Plans should be made for phased implementation of screening, diagnosis and treatment of hepatitis (starting with pilots to determine service delivery models, financing strategies, etc.).
- (4) Areas for additional research: develop collaboration in research and develop an operational research agenda, with consideration to the following areas
- (a) Development should be supported of heat-stable hepatitis B vaccines for use outside the cold chain; such vaccines need to meet WHO standards for prequalification and be available at low cost.
 - (b) For preventing mother-to-child transmission of HBV infection, universal access to three-dose coverage needs to be enhanced, including a birth dose within 24 hours and, where appropriate, the use of antiviral medications to further reduce mother-to-child transmission of HBV.
 - (c) Treatment as prevention for HBV and HCV infection should be further studied through modeling, and considered and evaluated where appropriate.

AGENDA

Day 1 – Tuesday, 1 April 2014

Time	Topic	Presenter
09:00–09:20	<i>Opening remarks</i>	Dr Shin Young-soo, Regional Director, <i>WHO Regional Office for the Western Pacific</i>
09:20–10:00	<i>Introduction</i> <ul style="list-style-type: none"> Objectives, expected outcomes and role of the Hepatitis Expert Working Group (HEWG) Introduction of participants Update on the Global Hepatitis Programme (GHP): where are we today Feedback from the Global Strategic Advisory Group and Partners Meeting on Viral Hepatitis and implications for the Western Pacific Region 	Ying-Ru Lo, HIV, Hepatitis and STI, <i>WHO Regional Office for the Western Pacific</i> Rosmawati Mohamed, <i>University of Malaya Medical Center</i>
10:00–10:15	<i>Coffee/tea break</i>	
10:15–10:30	<i>Axis 1: Raising awareness, promoting partnerships and mobilizing resources</i> <ul style="list-style-type: none"> Public–private partnerships and catalytic philanthropy 	Yan Chan, <i>ZeShan Foundation</i>
10:30–10:45	<ul style="list-style-type: none"> Building partnerships and creating a national action plan for viral hepatitis in the Philippines: issues and challenges 	Janus Ong, <i>Hepatology Society of the Philippines; University of the Philippines College of Medicine</i>
10:45–11:50	<i>Discussion: Raising awareness on hepatitis and activities for World Hepatitis Day</i>	Moderator: Eric Wiesen, Expanded Programme on Immunization, <i>WHO Regional Office for the Western Pacific</i>
11:50–12:00	<i>Group photograph on the front lawn</i>	
12:00–13:00	<i>Lunch</i>	
13:00–13:15	<i>Axis 2: Evidence-based policy and data for action</i> <ul style="list-style-type: none"> Overview of hepatitis surveillance 	Francisco Averhoff, <i>US Centers for Disease Control and Prevention</i>
13:15–13:30	<ul style="list-style-type: none"> Hepatitis A and E surveillance and outbreak response 	Bao-Ping Zhu, <i>WHO EURO, Turkey Office</i>
13:30–13:45	<ul style="list-style-type: none"> Strategies for viral hepatitis surveillance and building laboratory testing capacity for hepatitis 	Vu Ngoc Long, <i>Ministry of Health, Hanoi, Viet Nam</i>

Time	Topic	Presenter
13:45–14:45	surveillance in Viet Nam <i>Discussion: Role of surveillance in management of hepatitis</i>	Moderator: Nicole Seguy, <i>WHO Regional Office for the Western Pacific</i>
14:45–15:00	<i>Coffee/tea break</i>	
15:00–15:20	<ul style="list-style-type: none"> Building a laboratory network 	Benjamin Campbell Cowie, <i>Victorian Infectious Disease Laboratory, Australia</i>
15:20–15:40	<ul style="list-style-type: none"> Fondation Mérieux’s experience: building laboratory capacity and increasing hepatitis awareness in resource-limited settings 	Christian Trepo, <i>Fondation Mérieux</i>
15:40–15:50	<ul style="list-style-type: none"> Results of regional laboratory gap analysis 	Sandra Walker, <i>WHO Regional Office for the Western Pacific</i>
15:50–16:05	<ul style="list-style-type: none"> National Center for Global Health's role in assisting with surveillance activities – the Lao PDR example 	Masahiko Hachiya, <i>National Center for Global Health and Medicine, Tokyo</i>
16:05–16:45	<i>Discussion: Laboratory testing, new diagnostic tests, laboratory capacity, priorities/actions for plan</i>	Moderator: Youngmee Jee, <i>Expanded Programme on Immunization, WHO Regional Office for the Western Pacific</i>
16:45–17:15	<ul style="list-style-type: none"> Update on the World Health Assembly resolution on viral hepatitis 	Charles Gore, <i>World Hepatitis Alliance, Geneva, Switzerland</i>

Day 2 – Wednesday, 2 April 2014

Time	Topic	Presenter
8:00–8:15	<p>Axis 3: Prevention of transmission</p> <ul style="list-style-type: none"> Prevention of hepatitis through vaccination 	Eric Wiesen, <i>WHO Regional Office for the Western Pacific</i>
8:15–8:30		Jong-Hyun Kim, <i>The Catholic University of Korea</i>
8:30–8:45		Margaret Hellard, <i>Burnet Institute</i>
8:45–9:00		Surenkhand Gungaa, <i>National Center of Communicable Diseases, Mongolia</i>
9:00–10:00		Moderator: Jose Sollano, <i>University of Santo Tomas, Philippines</i>
10:00–10:45	<i>Coffee/tea break and courtesy call with RD</i>	
10:45–11:00	<p>Axis 4: Screening, care and treatment</p> <ul style="list-style-type: none"> Hepatitis C virus care and treatment cascade 	Kiren Mitruka, <i>US Centers for Disease Control and Prevention</i>
11:00–11:15		John Wong, <i>Tufts University School of Medicine, USA</i>
11:15–11:30		Jia Jidong, <i>Beijing Friendship Hospital, Capital Medical University</i>
11:30–12:00		Moderator: Rosmawati Mohamed, <i>University of Malaya Medical Center</i>
12:00–13:00	<i>Lunch break</i>	
13:00–13:15	<ul style="list-style-type: none"> Systematic review and cost–effectiveness analysis on viral hepatitis B and C treatment 	Mehlika Toy, <i>Asia Pacific Alliance against Viral Hepatitis, Stanford University</i>
13:15–13:30		Wei Lai, <i>Peking University Hepatology Institute, China</i>
13:30–13:45		Carol Beaver, <i>Charles Darwin University, Australia</i>

Time	Topic	Presenter
13:45–14:15	<i>Discussion: Regional and national strategies for increasing access and lowering drug costs</i>	Moderator: Xu Ke, <i>Health Care Financing, WHO Regional Office for the Western Pacific</i>
14:15–14:30	<i>Coffee/tea break</i>	
14:30–17:00	<p><i>Final discussion, prioritization and action plan</i></p> <ul style="list-style-type: none"> • Introduction to group work • Breakout Group I: axes 1 and 2, Group II: axes 3 and 4 • Reports from Groups I and II • Plenary discussion <ul style="list-style-type: none"> ○ Development of a regional action plan ○ Next steps 	<p>Moderators:</p> <p>Francisco Averhoff, <i>US Centers for Disease Control and Prevention</i></p> <p>Ying-Ru Lo, <i>HIV, Hepatitis, and STI, WHO Regional Office for the Western Pacific</i></p>
17:00	<i>Closing remarks</i>	

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