



MEETING REPORT

**AN INFORMAL CONSULTATION ON VALIDATION OF ELIMINATION OF  
MOTHER-TO-CHILD TRANSMISSION OF HIV,  
HEPATITIS B AND SYPHILIS: DEVELOPING THE METHOD FOR  
VALIDATING HEPATITIS B VIRUS ELIMINATION**

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**World Health  
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Representative Office  
for Malaysia, Brunei Darussalam  
and Singapore



World Health Organization Office of the Representative to  
Malaysia, Brunei Darussalam and Singapore

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DEVELOPING THE METHOD FOR VALIDATING HEPATITIS B VIRUS ELIMINATION

Convened by:

MINISTRY OF HEALTH, MALAYSIA

WORLD HEALTH ORGANIZATION

OFFICE OF THE REPRESENTATIVE TO  
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## NOTE

The views expressed in this report are those of the participants of the *Informal Consultation on Validation of Elimination of Mother-to-Child Transmission of HIV, Hepatitis B and Syphilis: Developing the Method for Validating Hepatitis B Virus Elimination* and do not necessarily reflect the policies of the conveners.

This report has been prepared by the World Health Organization Office of the Representative to Malaysia, Brunei Darussalam and Singapore for those who participated in the Informal Consultation on Validation of Elimination of Mother-to-Child Transmission of HIV, Hepatitis B and Syphilis: Developing the Method for Validating Hepatitis B Virus Elimination in Putrajaya, Malaysia from 27 to 28 February 2018. The first draft of the report was written by Karina Razali.

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Keywords:

Child health / Maternal health / Hepatitis B - prevention and control / HIV infections / Syphilis



# SUMMARY

The *Informal Consultation on Validation of Elimination of Mother-to-Child Transmission of HIV, Hepatitis B and Syphilis: Developing the Method for Validating Hepatitis B Virus Elimination* was held in Putrajaya, Malaysia from 27 to 28 February 2018. The consultation was convened by the Malaysian Ministry of Health and the World Health Organization (WHO) to discuss potential approaches for validation within the primary context of Malaysia, and to provide input to the development of WHO guidance on elimination of mother-to-child transmission (EMTCT) of hepatitis B virus (HBV).

Participants discussed the following:

- 1) the definition and criteria of EMTCT, particularly in the context of countries with sustained high vaccination coverage and low hepatitis B surface antigen (HBsAg) prevalence among children, as well as shifting the focus from HBsAg prevalence to a threshold mother-to-child transmission (MTCT) rate,
- 2) the lessons learnt in EMTCT of HBV as shared by country representatives from China, Mongolia and Thailand;
- 3) the application of combined validation methods including the potential for integration with existing or planned surveys;
- 4) the use of modelling approaches along with empirical data to design intervention strategies, define threshold rates, determine validation methods and advocate for resource allocation; and
- 5) the use of programme data for monitoring and validation.

Recommendations for the Government of Malaysia are as follows:

- 1) Establish a national task force for the triple EMTCT of HIV, HBV and syphilis.
- 2) Address EMTCT of HBV in the broader context of primary health care and comprehensive viral hepatitis control.
- 3) Review the experiences and data from Sabah state, and expand voluntary antenatal HBsAg testing and management of mothers and exposed infants.
- 4) Integrate the management of pregnant women diagnosed with chronic HBV with existing EMTCT guidelines for HIV and syphilis, within the context of broader maternal, newborn and child health (MNCH) and clinical guidelines.
- 5) Establish a monitoring and evaluation framework for EMTCT of HBV.
- 6) Strengthen programme data and develop mechanisms to include private sector data.
- 7) Use modelling approaches in the design of strategies and the validation of EMTCT of HBV.
- 8) Link a planned HBsAg serosurvey to a suitable existing survey, and expand it to include other age groups.
- 9) Address the issue of migrant and undocumented populations in the context of universal health coverage.
- 10) Ensure that HBV control activities address stigma and discrimination of people living with chronic HBV.
- 11) Harmonize the approach to EMTCT of HBV with existing HIV and syphilis mechanisms.
- 12) Mobilize and allocate sufficient resources for the implementation of these recommendations.

Recommendations for WHO are as follows:

- 1) Provide guidance for the use of alternative methods to large-scale serosurveys to document achievement of 0.1% HBsAg prevalence among 5-year-old children.
- 2) Consider the use of an MTCT rate consistent with a 0.1% prevalence target for validation of EMTCT of HBV and determine its threshold.
- 3) Develop and gain experience in vetting a small number of essential process indicators for EMTCT of HBV.
- 4) Develop guidance and a toolkit for implementation of interventions for EMTCT of HBV.
- 5) Develop integrated global guidance and tools for the validation of triple elimination of HIV, HBV and syphilis.
- 6) Consider the establishment of a strategic information and modelling reference group or consortium for hepatitis.
- 7) Ensure a stronger representation of triple EMTCT of HIV, HBV and syphilis within the *WHO* global health sector strategies on HIV, hepatitis and STI.



# 1. INTRODUCTION

## 1.1 Meeting organization

The *Informal Consultation on Validation of Elimination of Mother-to-Child Transmission of HIV, Hepatitis B and Syphilis: Developing the Method for Validating Hepatitis B Virus Elimination* was held in Putrajaya, Malaysia from 27 to 28 February 2018. It was convened by the Malaysian Ministry of Health and the World Health Organization (WHO). It brought together representatives from the Ministry of Health, local experts from Malaysia and international subject-matter experts, including representatives from China, Thailand and Mongolia. The participants discussed potential approaches for validation within the primary context of Malaysia, and developed recommendations for global guidance on elimination of mother-to-child transmission (EMTCT) of hepatitis B virus (HBV).

## 1.2 Meeting objectives

The objectives of the meeting were:

- 1) to review the latest evidence on mother-to-child transmission (MTCT) of HBV, including country data;
- 2) to discuss lessons learnt by countries that are planning for validation of EMTCT of HBV;
- 3) to discuss methods for validation of EMTCT of HBV; and
- 4) to develop recommendations for the establishment of national guidance on piloting validation of EMTCT of HBV in Malaysia.

## 1.3 Expected outcomes

The expected outcomes of the meeting were:

- 1) recommendations for next steps for pilot validation of EMTCT of HBV in Malaysia;
- 2) proposed indicators and methods for validation of EMTCT of HBV reviewed;
- 3) cost and feasibility of different approaches and funding sources for national validation efforts discussed; and
- 4) draft recommendations for national guidance on process and criteria for validation of EMTCT of HBV.

## 2. PROCEEDINGS

### 2.1 Opening session

The draft Regional Framework for Triple Elimination of Mother-to-Child Transmission (EMTCT) of HIV, Hepatitis B and Syphilis in Asia and the Pacific 2018–2030 proposes a coordinated approach towards triple elimination using maternal, newborn and child health (MNCH) platforms. The integrated Framework sets global targets for each of the three diseases:  $\leq 50$  new paediatric HIV infections per 100 000 live births and a transmission rate of either  $< 5\%$  in breastfeeding populations or  $< 2\%$  in non-breastfeeding populations;  $\leq 50$  cases of congenital syphilis per 100 000 live births by 2030; and 0.1% prevalence of hepatitis B surface antigen (HBsAg) prevalence rate among 5-year-old children by 2030. The Regional Framework, which was endorsed in October 2018 by the WHO Regional Committee for the Western Pacific and by all Member States, proposes a coordinated approach to achieve and sustain elimination in an effective and efficient manner, based on three pillars: 1) coordinated national policy and strategy; 2) seamless high-quality care for women, newborns, children and their families; and 3) coordinated monitoring and evaluation of elimination.

The EMTCT of HIV and syphilis is measured through the achievement of global impact targets and process targets (intervention coverages of antenatal care [ANC], testing and treatment). There are also additional requirements for validation. Candidate countries must meet the following global minimum criteria, as stated verbatim in the global guidance on EMTCT of HIV and syphilis:

- 1) National-level evidence of achievement of the EMTCT validation process indicator target for two years and achievement of validation impact indicator targets for one year. In countries where impact targets can be collected every year, achievement of validation impact indicator targets for two or more years is recommended before applying for EMTCT validation.
- 2) Evidence that EMTCT of HIV and/or syphilis has been adequately addressed in the lowest-performing subnational administrative units. The lowest-performing subnational administrative units are those known to perform poorly on relevant health indicators (e.g. those with the highest disease burden, lowest levels of service coverage, or an estimated MTCT rate of HIV and/or congenital syphilis rate that may not meet the global EMTCT validation targets). This approach is similar to that used by the maternal and neonatal tetanus elimination programme. It helps to ensure that the validation process addresses equity in health service coverage. Where specific key populations are important for EMTCT, assessment of EMTCT efforts in these groups should be part of the process. Countries are encouraged to work with the regional validation committee to determine an appropriate selection process for the subnational administrative unit.
- 3) Existence of an adequate 'validation standard' national monitoring and surveillance system that can capture process data from both the public and private health sectors, and detect the great majority of cases of MTCT of HIV and/or syphilis.
- 4) Validation criteria must have been met in a manner consistent with basic human rights considerations.<sup>1</sup>

### 2.2 Elimination of mother-to-child transmission of HBV

#### 2.2.1 EMTCT of HBV intervention strategies

The Regional Framework presents potential new interventions for preventing HBV transmission, building upon high coverage hepatitis B vaccination programmes to achieve the hepatitis B global target. It proposes an incremental approach to the prevention of HBV infection at birth and in the first years of life that is built upon a four-tiered pyramid structure. At the base is the provision of at least three doses of hepatitis B vaccine, including a timely birth dose within 24 hours. Next is the conduct of HBsAg testing of pregnant women, with linkage to care and follow-up of infants. The top two tiers relate to the provision of hepatitis B immunoglobulin (HBIG) for children born to HBsAg-positive mothers, and ultimately, antiviral treatment if the viral load is high.

<sup>1</sup> Global guidance on criteria and processes for validation: elimination of mother-to-child transmission of HIV and syphilis, 2nd edition. Geneva: World Health Organization; 2018 (<http://www.who.int/reproductivehealth/publications/emtct-hiv-syphilis/en/>).

Vaccination including birth-dose immunization is still very much the foundation of the intervention strategies for EMTCT of HBV. Interventions beyond immunization, including antenatal HBsAg testing and antiviral treatment, need to be tailored to the context of each country. Evidence on the efficacy of antiviral treatment for mothers with high viral loads is being generated. For the combination intervention of HBIG and antivirals, the question of whether HBIG can be removed from the treatment protocol has yet to be answered.

Intervention efforts for EMTCT of HBV need to be integrated within the MNCH platform, where prevention and treatment are provided during and after pregnancy. In other words, addressing EMTCT and caring for mothers with hepatitis B should be done within the context of an integrated programme to better health of mothers and children.

### 2.2.2 Challenges

The meeting participants acknowledged that there is agreement and support for the adoption of the triple elimination target. However, Malaysia, like most low- and middle-income countries, does not have the experience of reaching and validating EMTCT of HBV against the new target of 0.1% HBsAg prevalence by 2030, and thus will require further guidance on the methods and strategies. Efforts toward achieving EMTCT of HIV, HBV and syphilis should fall in line with the push for universal health coverage.

Challenges are foreseen in the following areas: data availability and quality, preparation and readiness of the overall health-care system, countries with large populations, and adequate laboratory support as well as the affordability, cost and quality of testing, particularly sensitivity and specificity of rapid tests.

## 2.3 Country experiences

### 2.3.1 Malaysia

In 2011, Malaysia was verified as having achieved the 2018 regional target of <1% HBsAg seroprevalence among 5-year-old children. National estimates of HBsAg prevalence among the general population were 1.1% [95% confidence interval (CI): 0.8–1.5%] in 2015,<sup>2</sup> and 0.7% (<1% among adults and <0.5% among children) in 2016. The country has submitted a request to WHO for pre-validation of dual EMTCT of HIV and syphilis, and it was proposed by WHO that the EMTCT of HBV be included. It was with this consideration that Malaysia expressed interest in being involved in the development and piloting of WHO global guidance on validation of EMTCT of HBV.

Malaysia introduced hepatitis B vaccine into the National Immunization Programme in 1989, with two to three years of implementation roll-out. Free vaccination is provided for all citizens (with a minimal fee required for non-Malaysian citizens since 2015). While the sampling of data and estimates of coverage are not currently standardized, existing data indicate that the coverage of hepatitis B vaccination is greater than 95% nationwide. Hepatitis B vaccination is given at birth within 24 hours, followed by boosters at one month and six months.

Large-scale antenatal HBsAg testing had been provided in the state of Sabah in Malaysia where hepatitis B prevalence is high, in particular among local ethnic groups and among migrant populations. In other states, antenatal care attendees are offered risk-based testing based on clinical judgement, with no national definition of high-risk groups. For adults, hepatitis B vaccination is given to health-care workers and others in high-risk occupational groups.

Nationally, data on hepatitis B are limited to notification data, which are obtained largely through passive case detection. Reporting of diagnosed hepatitis B is compulsory, through an either online or manual reporting system. A spike in notification rates was observed in 1998, marking the initiation of HIV testing of foreign workers, but these rates eventually dropped by 2004, when case detection among foreign workers was no longer included in the national incidence notification reports. By 2012, notification rates began to climb again, mostly due to the undifferentiated reporting of both acute and chronic cases.

In the state of Sabah, the State Health Department has been making efforts to implement state-wide universal HBsAg testing of antenatal care attendees.

2 Global and country estimates of immunization coverage and chronic HBV infection: WHO HBsAg dashboard. (<http://whohbsagdashboard.com/#global-strategies>).

The prevalence of HBV infection among antenatal care attendees in Sabah was reported to have increased from 1.5% in 2015 to 2.8% in 2018. These data however do not reflect a time trend, particularly due to the changing denomination. Notably, since 2018, testing was scaled back due to financial constraints. Sabah is also known to have a relatively high proportion of migrant and undocumented populations; migrants make up about 30% of vaccinations. Similarly, among mothers who were vaccinated for hepatitis B, 10–30% were migrants.

### 2.3.2 China

- 1) China reported a 5.5% HBV prevalence in 2016, but with a high degree of geographical differences.<sup>3</sup> High antenatal HBsAg testing coverage has been recorded, and HBIG is given free of charge for exposed infants.
- 2) The three-dose hepatitis B vaccination regimen was introduced between 1992 and 1996. The prevention of mother-to-child transmission (PMTCT) programme was initiated in one province in 2001 and gradually expanded nationwide by 2015. The EMTCT of HBV programme was launched in 2016.
- 3) Based on WHO validation tools, China developed its own EMTCT guidelines. The EMTCT strategy follows a “life cycle” approach, involving before and after pregnancy care, maternal care, child care as well as adolescent care. Furthermore, through an integrated (iPMTCT) programme, a comprehensive package of services is provided free of charge to pregnant women with HIV, HBV or syphilis.
- 4) With over 98% birth-dose and third-dose coverage, HBIG treatment for children born from HBsAg-positive mothers and antenatal HBsAg testing (up to 99%), China is conducting several projects using new intervention strategies. The Shield project provides antiviral treatment for HBsAg-positive pregnant women with high levels of HBV DNA ( $>10^6$  IU/mL), and a post-vaccination serologic testing (PVST) project monitors the outcome of exposed infants.

### 2.3.3 Mongolia

In Mongolia, over 96% of pregnant women were screened for HBV in 2018, and 2.5% of these women were found to be infected with HBV (HBsAg and HBV DNA positive). National guidelines issued in 2016 recommend antiviral therapy for pregnant women with HBV DNA  $>10^6$  IU/mL starting at 28–32 weeks of gestation, similar to the threshold used in China’s Shield project. This antenatal treatment threshold differs from Australia, which currently uses a HBV DNA  $>10^7$  IU/mL threshold to begin tenofovir treatment at 28–32 weeks of gestation through four weeks postpartum. The Mongolian Ministry of Health recommends antiviral treatment with tenofovir for patients with chronic hepatitis B as it is available at US\$ 7 per month with 50% coverage by health insurance and 50% by patients. However, national implementation of antiviral therapy for pregnant women has been difficult as the cost has to be primarily paid out of pocket (tenofovir for EMTCT is neither included in the health insurance benefit package nor part of the Healthy Liver programme, which covers hepatitis B and C testing and treatment for adults aged 40–65 years old). Moreover there is no detailed operational guidance on antenatal hepatitis B treatment. The next phase of the Healthy Liver programme will recommend voluntary universal hepatitis B and C testing for people aged 15–40 years old. Hepatitis C antibody testing for pregnant women is offered.

### 2.3.4 Thailand

In Thailand, universal hepatitis B vaccination was piloted in two provinces in 1988, and was expanded to the entire country by 1992 through integration into the Expanded Programme on Immunization (EPI). Thailand also provides antenatal HBsAg testing. Whilst the hepatitis B vaccine is provided free of charge, HBIG has to be paid out-of-pocket. In 2016, hepatitis B vaccination coverage was high ( $>99\%$  for the birth dose and third dose). Thailand had  $>98\%$  health facility delivery coverage and antenatal HBsAg testing. The HBV serosurvey in seven Thai provinces in 2014 showed HBsAg prevalence among children  $<5$  years was 0.1%. It also revealed a significant reduction in HBsAg prevalence among children born after the launch of the EPI programme in 1992 (0.6%) compared to those born before it (4.5%).

<sup>3</sup> Hepatitis data and statistics: epidemiological estimates for viral hepatitis for the Western Pacific. Manila: WHO Regional Office for the Western Pacific; 2018 ([http://www.wpro.who.int/hepatitis/data/hepatitis\\_data\\_statistics/en/](http://www.wpro.who.int/hepatitis/data/hepatitis_data_statistics/en/)).

Thailand received WHO certification for dual elimination of HIV and syphilis in June 2016. It is now aiming for triple elimination, with the target of EMTCT of HBV (<0.1%) by 2025. A national EMTCT HBV working group was established in January 2018. Guidelines for EMTCT of HBV (2018) recommend antiviral treatment with tenofovir for hepatitis B e antigen (HBeAg)-positive pregnant women from gestational age of 26–30 weeks through four weeks after delivery and monitoring of alanine aminotransferase (ALT). The new guidelines will be piloted in 12 provinces in 2018. Data from the demonstration project will be used to promote tenofovir inclusion in the benefit package and expansion of the programme nationwide.

## 2.4 Defining EMTCT of HBV and the threshold for MTCT rate

As vaccination coverage increases and prevalence decreases, the risk of horizontal transmission becomes very low. This may enable us to assess final (EMTCT) outcome at younger ages (i.e. under 5 years compared to 5 years and older) and the use of MTCT rate at 12 months. Shifting from a focus on HBsAg prevalence to an evidence-based MTCT rate or threshold may be the way forward (including the consideration of setting cut-off point of HBsAg prevalence to move to MTCT rate) for countries with sustained high vaccination coverage and low HBsAg prevalence among children.

In order to calculate a recommended MTCT rate, there is a need to screen pregnant women and determine the effect of various hepatitis B interventions on the outcome of exposed infants through PVST. Moreover, the benefit of antenatal testing goes well beyond the prevention of MTCT to also include linkages to care and treatment, prevention of cirrhosis and cancer, and expansion of testing and care for other possibly affected family members. Cost analysis of recommending universal antenatal testing and other interventions may support high-level advocacy for allocation of resources.

Modelling can inform the MTCT threshold that can qualify for EMTCT. Provision of antenatal testing and PVST for exposed babies will also be able to suggest the MTCT criteria (e.g. China).

## 2.5 Modelling approaches in EMTCT strategies and for validation of EMTCT

Modelling was used to inform the *Global Health Sector Strategy for Viral Hepatitis 2016–2021* after the 2014 World Health Assembly resolution. A systematic review of HBV data for adults and children by country revealed gaps in data availability, particularly for some countries that have not done a biomarker survey. These data gaps were filled using modelling estimates.

China has used modelling to examine different packages of interventions against HBV and their projected impact on achieving the global target of 0.1% HBsAg prevalence among 5-year-olds, as did Thailand in forecasting a plan to achieve EMTCT by 2025. The potential roles of modelling in validation of EMTCT could include: to determine intervention coverage levels consistent with elimination, to determine the MTCT threshold that is consistent with EMTCT, to conduct spatial mapping using subnational estimates, and to combine with a new WHO survey design to strengthen validity of areas for survey sampling (See section 2.5.2 for more details).<sup>4</sup>

## 2.6 Methods for validation

### 2.5.1 Alternative approaches to serosurveys

Global guidelines for validation of elimination of HIV and syphilis already exist,<sup>1</sup> and these could be used as a reference point for the development of guidance for validation of EMTCT for HBV. However, particular aspects of EMTCT need to be addressed. One such matter is the need for alternative approaches to serosurveys to determine HBV prevalence in the population.

Documentation of  $\leq 0.1\%$  prevalence among children needs alternative approaches because traditional serosurveys require large sample sizes and are expensive. As Malaysia plans its next serosurvey in 2019, careful consideration of alternative approaches is needed. Where possible, integration of any new approaches with existing and/or planned surveys should be explored.

<sup>4</sup> Vaccination coverage cluster surveys: reference manual. Manila: World Health Organization; 2015. ([http://www.who.int/immunization/monitoring\\_surveillance/Vaccination\\_coverage\\_cluster\\_survey\\_with\\_annexes.pdf](http://www.who.int/immunization/monitoring_surveillance/Vaccination_coverage_cluster_survey_with_annexes.pdf))

Malaysia is planning its next serosurvey in 2019. If a *two-step cluster survey* was used (See section 2.5.2), data from hepatitis B notification, cancer registry and vaccination coverage could be used to identify high-risk areas for oversampling. Antenatal sentinel HBsAg surveillance could also be incorporated into this study to inform prevalence and trends, identify high-risk areas and provide data for modelling.

### 2.5.2 Two-step method

WHO had published a reference manual on vaccination coverage cluster surveys (2015) which include guidelines for using classification cluster surveys to determine if the prevalence is above or below a specified threshold.<sup>5</sup> Another alternative method to traditional hepatitis B serosurveys includes the two-step method, where regions are first categorized as either high or low risk, and then community-based surveys are conducted with oversampling of high-risk areas to determine whether these areas are below the predetermined threshold. If the high-risk regions are below this threshold, then it can be reasonably deduced that regions at lower risk will also have met this threshold. The target population could potentially be expanded to the general population (e.g. women of reproductive age). Based originally upon the verification of maternal and neonatal tetanus elimination,<sup>5</sup> a pilot of this two-step method for hepatitis B testing is planned to be completed in Columbia in 2018.

The meeting participants recognized that it is necessary to combine several methods to validate EMTCT of HBV where prevalence of chronic hepatitis B among children is low (e.g. <1%).

Programme data (e.g. antenatal testing, hepatitis B vaccination coverage, outcome of exposed infants) will help provide the MTCT rate or threshold for EMTCT of HBV. Combined with demographic and epidemiological data (e.g. prevalence of HBsAg among pregnant women), seroprevalence among children can be estimated through modelling.

While the meeting participants agreed that a traditional serosurvey may not be feasible or cost-effective for the documentation of 0.1% seroprevalence, the use of a *two-step method* or other survey methods may be considered where feasible, potentially expanding the target population to the general population (e.g. women of reproductive age), to estimate prevalence among children as well as provide data for programme planning (e.g. high-burden areas) and modelling.

## 2.7 Review of programme data

The participants recognized the importance of programme data for monitoring and validation. Data quality including completeness and coverage needs to be ensured and sensitivity analysis needs to be conducted for EMTCT of HBV validation, taking experiences from EMTCT of HIV and syphilis validation. It was recognized that availability of high-quality programme data, including universal antenatal testing coverage data, is essential in order to pursue assessment of the achievement of 0.1% seroprevalence.

More effort is needed to obtain data from the private sector. While notification data may be available, the lack of denominator data on how many people were screened poses a limitation. In Malaysia, an estimated 20% of antenatal visits take place at private health care facilities, and the majority of health screening packages at private clinics and laboratories include hepatitis B tests.

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<sup>5</sup> WHO. Validation of Maternal and Neonatal Tetanus Elimination including a guide to the Use of Lot Quality Assurance – Cluster Sample Surveys to assess neonatal tetanus mortality. 2012. Switzerland, WHO/V&B/02.05.

## 3. CONCLUSIONS AND RECOMMENDATIONS

### 3.1 Conclusions

The outcomes of the meeting were:

- 1) recommendations for next steps for pilot validation of EMTCT of HBV in Malaysia;
- 2) proposed indicators and methods for validation of EMTCT of HBV;
- 3) cost and feasibility of different approaches and funding sources for national validation efforts discussed; and
- 4) draft recommendations for national guidance on process and criteria for validation of EMTCT of HBV.

### 3.2 Recommendations

#### 3.2.1 Recommendations for Malaysia

The Government of Malaysia is encouraged to do the following:

- 1) Establish a national task force for the triple EMTCT of HIV, HBV and syphilis, with the possibility of expanding it to other priority communicable diseases in the future.
- 2) Address EMTCT of HBV in the broader context of primary health care and comprehensive viral hepatitis elimination, including strengthening management of HBV-infected pregnant women and counselling and testing of partners and family members to reduce the burden of viral hepatitis.
- 3) Review and examine experiences and data from Sabah state on antenatal HBsAg testing, including the management of infected mothers and outcomes of exposed infants.
- 4) Pilot and expand voluntary universal antenatal HBsAg testing and management of mother and exposed infants in: a) another state with a different epidemic and demographic profile that may be more reflective of the national average; and 2) sentinel sites as demonstration projects.
- 5) Integrate the management of pregnant women diagnosed with chronic HBV with existing EMTCT guidelines for HIV and syphilis, within the context of broader MNCH guidelines and clinical guidelines for the management of hepatitis B.
- 6) Establish a monitoring and evaluation (M&E) framework for EMTCT of HBV as part of an overall disease and MNCH surveillance and monitoring plan.
- 7) Strengthen programme data (quality, coverage including primary health care level) and collate existing data to document parameters and outcome measures needed for potential modelling work.
- 8) Develop mechanisms to include private sector data, including HBsAg prevalence among pregnant women, to contribute to the validation of EMTCT of HBV.
- 9) Use modelling to examine intervention strategies (including universal antenatal testing, HBIG and antiviral treatment) and their impact, outcome of exposed infants and cost implications focusing on subnational and/or national level.
- 10) Link a planned HBsAg serosurvey to existing or other planned surveys, and consider expanding to include other age groups, not limited to 5-year-old children.
- 11) Address the issue of migrant/non-Malaysian and undocumented populations in the context of universal health coverage.

- 12) Ensure that HBV control activities address stigma and discrimination of children, teenagers and adults living with chronic HBV.
- 13) Harmonize the approach to EMTCT of HBV with existing HIV and syphilis mechanisms, including a focus on laboratory, external quality assurance programmes for laboratory services and human rights dimensions.
- 14) Mobilize and allocate sufficient resources for the implementation of these recommendations to ensure their success, sustainability and potential global implementation.

### **3.2.2 Recommendations for WHO**

WHO is requested to do the following:

- 1) Provide guidance for the use of alternative methods to large-scale serosurveys to document achievement of 0.1% HBsAg prevalence among 5-year-old children as a way forward for countries that have achieved 1% HBsAg prevalence with sustained high vaccination coverage.
- 2) Consider using an MTCT rate consistent with the 0.1% HBsAg prevalence target for validation of EMTCT of HBV and determine its threshold, guided through the incorporation of programmatic data and modelling approaches. The MTCT rate can be confirmed through post-vaccination serologic testing of infants born to HBsAg-positive and HBeAg-positive mothers, or where resources are limited, through testing of infants born only to HBeAg-positive mothers.
- 3) Develop and validate a small number of essential process indicators for EMTCT of HBV, which provide options for different interventions used in countries considering local context.
- 4) Develop guidance and tools for implementation of interventions for EMTCT of HBV, including universal antenatal HBsAg testing, HBV management of infected mothers and the outcomes of HBsAg-exposed infants, incorporating them into existing MNCH guidance and tools.
- 5) Develop integrated global guidance and tools for the validation of triple elimination of HIV, HBV and syphilis, including the incorporation of regional verification groups into the Global Validation Advisory Group, which currently has members dedicated to EMTCT of HIV and syphilis.
- 6) Consider establishment of a strategic information and modelling reference group or consortium for hepatitis to facilitate the application of models at the country level.
- 7) Ensure a stronger representation of triple EMTCT of HIV, HBV and syphilis within the WHO global health sector strategies on HIV, hepatitis and STI.



# ANNEXES

## Annex 1. Programme

Tuesday, 27 February 2018

Moderators	Dr Anita binti Suleiman and Dr Naoko Ishikawa
08:30–09:00	Arrival and registration
09:00–09:25	Introductions
09:25–09:30	Review of objectives and expected outcomes - Ministry of Health Malaysia and WHO
<b>9:30–13:45</b>	<b>Session 1: Elimination of mother-to-child transmission of HBV and country experience</b>
09:30–10:00	Malaysia's current EMTCT of HBV strategies - Dr Faridah binti Kusnin, Ministry of Health Malaysia Discussion
<b>10:00–10:15</b>	<b>Coffee Break</b>
10:15–10:30	EMTCT of HIV and syphilis and Asia-Pacific Triple Elimination Framework - Dr Naoko Ishikawa, WHO Regional Office for the Western Pacific
10:30–10:45	Global update on EMTCT of HBV - Dr Yvan Hutin, WHO headquarters
10:45–12:15 <i>15 min presentation x 3 and 30 min discussion</i>	Examples from other regions and countries on EMTCT of HBV - China: Dr Wang Ailing, China CDC - Thailand: Rangsim Lolekha, Thailand Ministry of Public Health–US CDC Collaboration - Mongolia: Narantuya Jadambaa, WHO Mongolia
<b>12:15–13:30</b>	<b>Lunch Break</b>
<b>Moderator</b>	<b>Dr A'ishah binti Senin</b>
<b>13:30–13:45</b>	<b>Opening remarks</b>  Dato Dr Haji Azman, Deputy Director General Public Health, Ministry of Health Malaysia Dr Ying-Ru Lo, WHO Representative to Malaysia, Brunei Darussalam and Singapore
<b>13:45–15:30</b>	<b>Session 2: Defining elimination of mother-to-child transmission of HBV</b> (Facilitators: Dr Benjamin Cowie and Dr Naoko Ishikawa)
13:45–14:05	Toward EMTCT of HBV: Global targets and initial concept for documentation - Dr Yvan Hutin, WHO headquarters
14:05–14:25	Modelling EMTCT: From the global modelling that led to the global strategy to country models, including in China
14:25–15:15	- Dr Shevanthi Nayagam, Imperial College London  Facilitated discussion Application for Malaysia

<b>15:15–15:30</b>	<b>Coffee Break</b>
<b>15:30–16:30</b>	<b>Session 3: Various methods for validation</b> (Facilitators: Dr Benjamin Cowie / Dr Naoko Ishikawa)
15:30–15:50	Hepatitis B control verification methodology in the Western Pacific and new approaches (e.g. cluster surveys) - Dr Joseph Woodring, WHO WPRO
15:50–16:30	Facilitated discussion Application for Malaysia
16:30–17:00	Review of Day 2 – decisions and recommendations
17:00–17:30	Secretariat meeting How can regional verification bodies be incorporated into global mechanisms?

### Wednesday, 28 February 2018

<b>Moderator</b>	<b>Dr Rozita binti Abdul Rahman</b>
08:30–09:00	Arrival
09:00–09:15	Recap of Day 2 findings and recommendations Introduction to expectations of Day 3 HBV in Sabah, Malaysia (Latebreaker- Dr Muhammad bin Jikal, Sabah State Health Department)
09:15–10:20	<b>Session 3: Various methods for validation (continued)</b> (Facilitators: Dr Benjamin Cowie and Dr Joseph Woodring)
09:15–09:30	Modelling for EMTCT of HBV - model overview, assumptions and required data.
09:30–10:20	- Dr Shevanthi Nayagam, Imperial College  Facilitated discussion Application for Malaysia
<b>10:20 – 10:40</b>	<b>Coffee break</b>
<b>10:40–16:00</b>	<b>Session 4: Review of administratively reported data</b> (Facilitators: Dr Benjamin Cowie and Dr Joseph Woodring)
10:40–11:00	Estimating MTCT rate using programme data (ANC data + follow-up of exposed children by serologic testing 1–2 months after final vaccine dose) - Dr Wang Ailing, China CDC
11:00–11:15	Integrating programme monitoring of EMTCT of HIV, HBV and syphilis within MCH platform – Dr Mathew Mathai, Centre for Maternal Health and Newborn Health
11:15–11:45	Facilitated discussion Application for Malaysia
11:45–12:30	Facilitated discussion on combined validation methods for EMTCT of HBV (Serosurvey + programme data + modelling)
<b>12:30–13:30</b>	<b>Lunch Break</b>
13:30–14:30	Draft recommendations for validation criteria and methods for EMTCT of HBV
14:30–15:30	Next steps for pilot validation of EMTCT of HBV in Malaysia
15:30–16:00	Conclusions

## Annex 2. List of participants

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