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CME / CPD / CNE / CEM point accreditation *(please refer to the test paper for details)*

Updates on the elimination status of mother-to-child transmission of hepatitis B virus in Hong Kong

Introduction

Hepatitis B is a liver disease caused by infection with Hepatitis B virus (HBV), which can be transmitted through mother-to-child transmission (MTCT), contact with contaminated blood and body fluids, and unsafe sexual practices. Some people fail to clear the virus after infection and develop chronic hepatitis B (CHB). In contrast with the about 5% risk of chronicity for HBV infection acquired during adulthood, up to 90% of newborn babies infected with HBV could develop chronic HBV infection [1]. Without treatment, 15-40% of untreated people with CHB could develop cirrhosis and liver cancer, imposing significant public health burden [2].

As derived from the results of Population Health Survey (PHS) 2020 – 22 conducted by the Department of Health, the prevalence of chronic HBV infection in Hong Kong was 5.6% in the general population, amounting to about 410 000 people living with hepatitis B [3]. Locally, the burden from chronic HBV infection was mainly attributed to infection acquired at infancy or during early childhood, similar to the situation in other hepatitis B-endemic places. The key drivers of local HBV transmission are thus related to whether interventions for preventing MTCT of HBV, including hepatitis B vaccination, administration of hepatitis B immunoglobulin (HBIg) and the use of maternal antiviral prophylaxis, are taken in time.

Long-established programmes to prevent MTCT of HBV in Hong Kong

To prevent MTCT of HBV, the antenatal care services are characterised by a comprehensive share-care programme in the public health sector, where various interventions through immunisation, treatment and testing for hepatitis B during pregnancy are readily accessible and available in public antenatal clinics. To standardise the antenatal care for hepatitis B pregnant women and promulgate the latest development of MTCT interventions, the Hong Kong College of Obstetrics and Gynaecologists (HKCOG) have guidelines on antenatal screening and management of hepatitis B for prevention of MTCT published in 2024 [4].

Since the 1980s, a series of interventions preventing MTCT of hepatitis B has been in place in Hong Kong. Notably, a universal childhood immunisation programme

for hepatitis B was launched in 1988. Prior to this, universal antenatal screening for hepatitis B surface antigen (HBsAg) had been introduced and hepatitis B immunoglobulin (HBIg) had been administered to babies born to HBsAg-positive mothers earlier in the 1980s. In addition, supplementary hepatitis B vaccination programme for primary school students was implemented in 1998. With antenatal screening, hepatitis B vaccination, and prophylaxis with HBIg at birth, local and international studies showed that only 0.7% – 1.1% of infants born to mothers with HBV infection develop infection [5-7].

New initiatives to strengthen the prevention of MTCT of HBV

As set out in the *Hong Kong Viral Hepatitis Action Plan 2020 – 2024* (*the Action Plan 2020 – 2024*) [8], two initiatives to further reduce the risk of MTCT of hepatitis B have been implemented, including the use of maternal antiviral prophylaxis and post-vaccination serologic testing (PVST). Following the implementation of these initiatives, the components included in the incremental approach for preventing HBV infection at birth and in the first years of life, as recommended by the World Health Organization (WHO) [9], have all been in place (Figure 1).

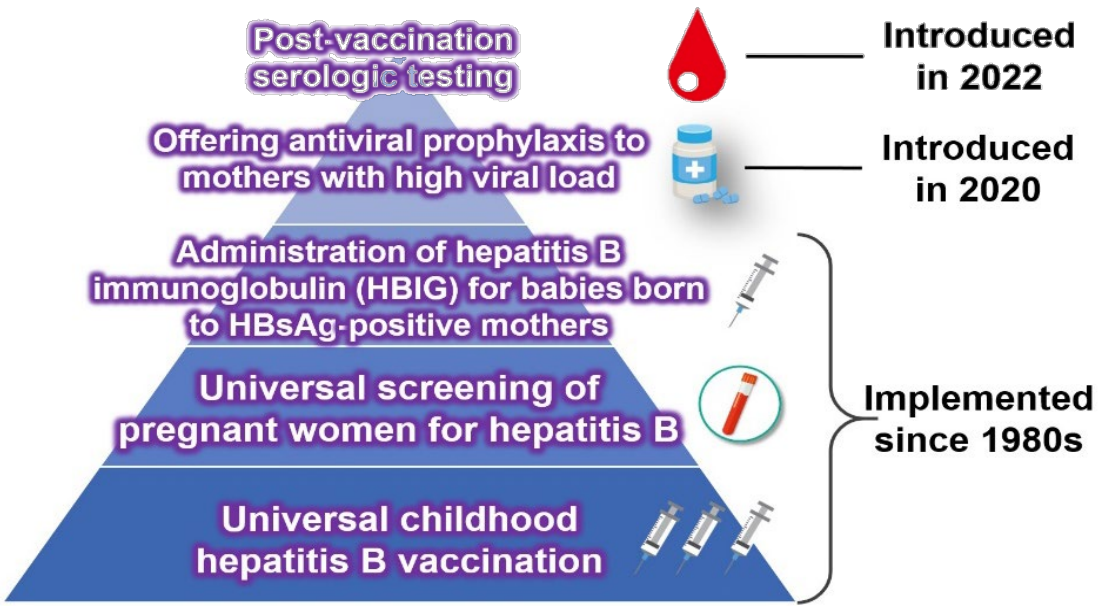

Figure 1. Incremental approach available for preventing HBV infection at birth and in the first years of life in Hong Kong

The use of antivirals to prevent MTCT of HBV

Since 2020, the WHO includes the recommendations regarding the use of antiviral prophylaxis for preventing MTCT of HBV. Pregnant women tested positive for

HBV infection (HBsAg positive) with an HBV DNA ≥ 5.3 $\log_{10}$ IU/mL (≥ 200 000 IU/mL) are recommended to receive tenofovir prophylaxis from the 28th week of pregnancy until at least birth, to prevent MTCT of HBV [9]. The same recommendations for initiating antiviral treatment to prevent immunoprophylaxis failure are also incorporated in the HKCOG guidelines published in 2024 [4]. As reported in a systematic review and meta-analysis, the use of tenofovir disoproxil fumarate (TDF) as peripartum antiviral prophylaxis is associated with a protective effect to reduce the risk of MTCT (Pooled odds ratio [OR]: 0.10, 95% CI: 0.03 – 0.35 for randomised controlled trials (RCT); pooled OR: 0.17, 95% CI: 0.10 – 0.29 for non-RCT) [10]. The same study also found no statistically significant differences in occurrence of maternal or infant adverse events between treated and control groups, and no association between cessation of TDF prophylaxis and increased risk of post-partum hepatitis B flare [10].

In August 2020, the initiative of using antivirals to prevent MTCT was rolled out to all birthing hospitals in Hospital Authority. Pregnant women receiving antenatal care in the public sector and screened positive for HBsAg will also undergo HBV DNA test. Those with high HBV viral load (HBV DNA > 200 000 IU/mL) have then been systematically identified, and referred to hepatology clinics and dedicated nurse-led clinics for assessment, counselling and initiation of antiviral prophylaxis by the third trimester [11-12]. This initiative has been well received by pregnant women with CHB. Among them, about 15% were identified with high viral loads, where more than 95% of them attended physician consultations and more than 90% of the attendees accepted receiving antiviral treatment [12-13].

Post-vaccination serologic testing

The PVST programme is another initiative set out in *the Action Plan 2020 - 2024* for strengthening the prevention of MTCT of HBV [8]. In January 2022, the PVST programme commenced, where babies born to mothers with HBV infection in April 2021 or thereafter would be arranged serologic testing after completing the primary series of the three-dose hepatitis B vaccination. With effect from June 2022, mop-up testing was also arranged for babies born to mothers with HBV infection since October 2020 before the age of 24 months.

The acceptance of the PVST has increased markedly throughout the years, rising from 78.0% in 2022 to over 95% in 2024 [14-15]. As of 30 June 2025, more than 3200 babies joined the PVST programme, where 95.3% of them were identified to be sero-protected, affirming the effectiveness of hepatitis B vaccination. The programme also found that 4.3% of the babies had inadequate

initial immune response, requiring re-vaccination, and 0.3% with HBV infection necessitating referral to specialist paediatric care [13, 15] (Figure 2). These efforts represent the significant strides in eliminating MTCT of HBV and advancing Hong Kong's goal of a hepatitis B-free generation.

The PVST programme also provides useful and systematic information to monitor the overall prevention strategy for MTCT of HBV. Clinical review of babies diagnosed with CHB and their mothers found that none of the mothers received maternal antiviral prophylaxis for various reasons, underscoring the critical role of antiviral treatment in minimising the residual risk of HBV MTCT in Hong Kong [16].

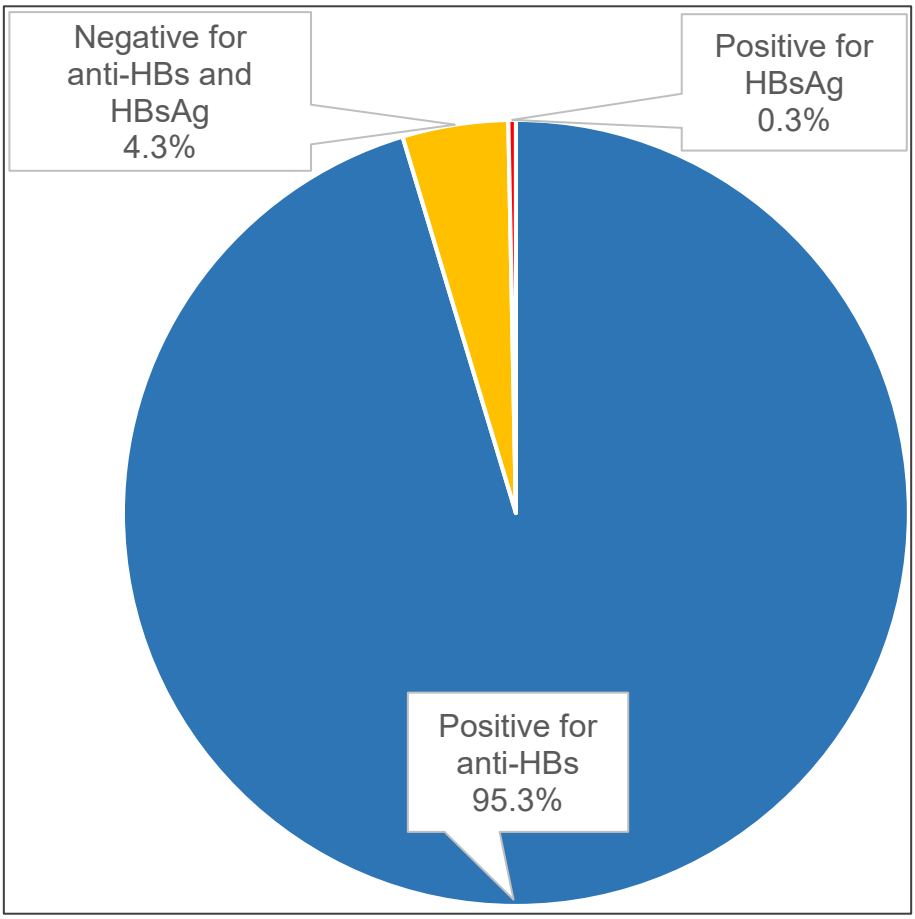

Figure 2. Distribution of the serologic outcomes after the primary series of the three-dose hepatitis B vaccination

Progress towards elimination of MTCT of HBV

Since 2021, elimination of MTCT (EMTCT) of HBV has become part of the "triple elimination" global initiative, which refers to a reduction in the number of new HIV, syphilis and HBV infections among infants and children to a level that would no longer be considered as a public health problem. The WHO has developed disease-

specific criteria, including both impact targets and process/ programmatic targets, for EMTCT in *Global guidance on the criteria and processes for validation: elimination of mother-to-child transmission of HIV, syphilis and hepatitis B virus* [17].

Impact targets for HBV EMTCT

For countries providing universal timely hepatitis B birth-dose vaccination to all neonates, the impact target refers to achieving ≤ 0.1% HBsAg prevalence among the ≤ 5-year-old birth cohort. For other countries providing targeted timely hepatitis B birth-dose vaccination[1], there is an additional impact target of ≤ 2% HBV MTCT rate is required to meet for achieving the impact targets for HBV EMTCT [17].

Prevalence of HBsAg in children ≤ 5 years old ≤ 0.1%

An integrated analysis of a series of data in Hong Kong, including those from PVST programme, local epidemiological studies and reports, service coverage of MTCT interventions and the reported residual risks of babies born to mothers with CHB, would allow estimation of the HBsAg prevalence in children ≤5 years.

From the PVST programme, the MTCT rate of HBV among babies born to HBsAg-positive mothers was 0.2% in 2024 [18]. While the HBsAg prevalence among antenatal women was reduced to 2.3% in the same year [19] and the risk of HBV infection is presumed to be very low for the children born to HBsAg-negative mothers [20], the estimated prevalence in children ≤5 years was thus estimated to be less than 0.1%. Findings from mathematical modelling results, based on a scenario with limited coverage of maternal antiviral prophylaxis (5%) and without considerations of the PVST arrangement, also suggest that HBsAg-positivity in children aged ≤5 years in Hong Kong has already been lower than 0.1% in 2022 [21].

Process/programmatic targets for HBV EMTCT

For countries with universal timely hepatitis B birth-dose vaccination, EMTCT process/ programmatic targets include ≥ 90% third-dose hepatitis B vaccine coverage and ≥ 90% hepatitis B birth-dose vaccination coverage. For other countries

[1] Targeted hepatitis B birth-dose vaccination is defined as providing hepatitis B birth dose only to infants born to mothers who tested positive for HBsAg

with targeted timely hepatitis B birth-dose vaccination, there are additional coverage targets for maternal HBsAg testing and antivirals for eligible HBsAg-positive pregnant women, both requiring to be ≥ 90% [17].

Coverage with 3 doses of hepatitis B vaccine (HepB3) in infants ≥ 90%

DH has been conducting immunisation coverage surveys (ICS) every two or three years starting from 2001 to determine the coverage of all vaccines under the Hong Kong Childhood Immunisation Programme. The surveys included children aged 2 to 5 years and attending pre-primary institutions including kindergartens and childcare centres. Results from ICS conducted in 2001, 2003, 2006, 2009, 2012, 2015, 2018, 2021 and 2024 confirmed high coverage of hepatitis B vaccination [22-30]. From the latest round of ICS conducted in 2024, the coverages of the first, second and third dose of hepatitis B vaccination were all exceeding 99% (Figure 3)

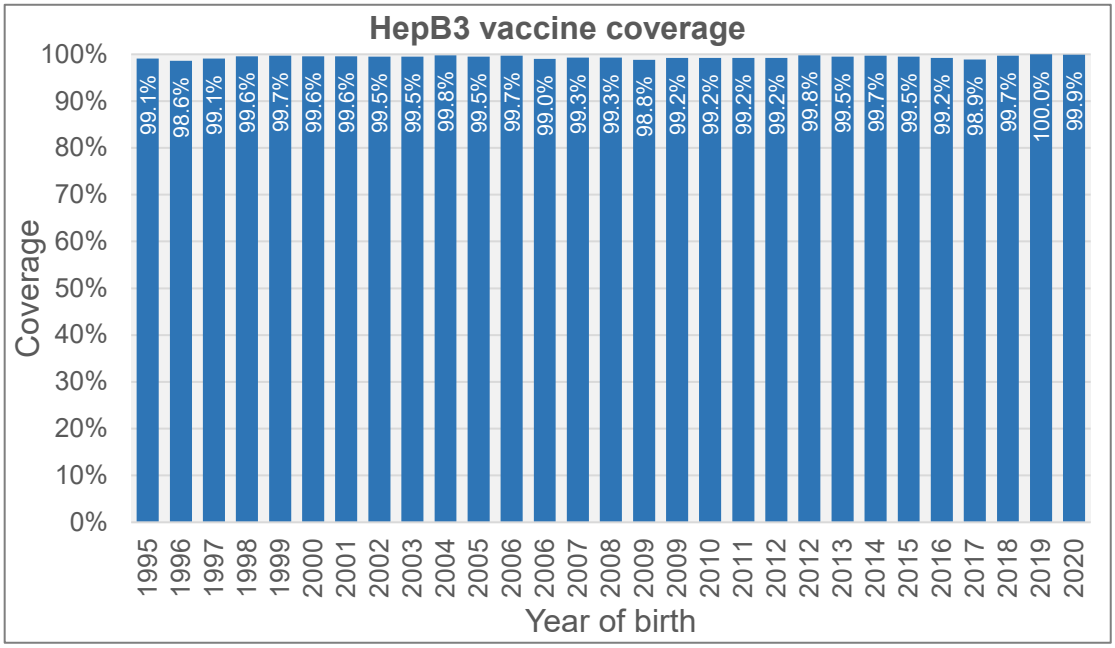

Figure 3. Findings of the coverage of the third dose hepatitis B vaccination from immunization coverage surveys regularly conducted by the DH

Coverage with timely hepatitis B birth dose (HepB-BD) ≥ 90%

DH has been collecting hepatitis B vaccination statistics from all birthing hospitals in both public and private sector in Hong Kong. The statistical return covers the number of birth-dose hepatitis B vaccines and HBIg administered in each hospital. By dividing the number of birth-dose hepatitis B vaccines administered by the number of live births, the coverage of hepatitis B birth dose maintained at a very high level in the past decade, exceeding 99% (Figure 4).

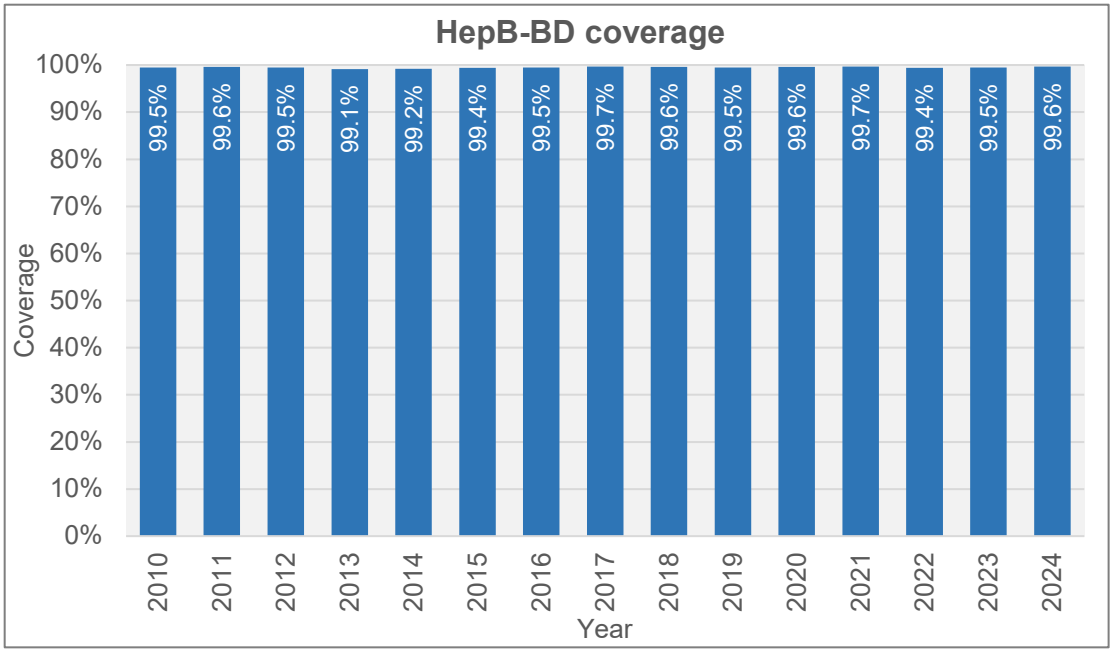

Figure 4. The coverage of the birth-dose hepatitis B vaccination

Conclusion and the way forward

Hong Kong has sustained a comprehensive MTCT prevention programme for over three decades. The universal neonatal hepatitis B vaccination programme, coupled with universal antenatal screening and administration of HBIg for infants born to mothers with hepatitis B, laid the groundwork. With the enhancement after introducing the use of maternal antiviral prophylaxis and PVST, Hong Kong has demonstrated a strong infrastructure to deliver maternal and child care services for the prevention of MTCT of HBV. The robust health system also provides representative programme data to support the evaluation of the achievements made in preventing new HBV infections in young children.

From the latest programme data, the coverage of the hepatitis B timely birth-dose and third-dose vaccination has long been well above the global targets set at 90%, indicating both process/ programme targets for HBV EMTCT have been met. In addition, both the estimation made using local programme data and findings from a modelling study suggest that the prevalence of HBsAg in children ≤ 5 years old has been lower than 0.1%, where the impact target for HBV EMTCT has also been achieved.

As set out in the *Hong Kong Viral Hepatitis Action Plan 2025 – 2030*, sustained prevention of MTCT of HBV remains an important strategic action for minimising and eliminating new HBV infections [13]. Future efforts will be dedicated to maintain core interventions - antenatal screening, neonatal vaccination,

immunoglobulin administration, and maternal antiviral prophylaxis - while systematically evaluating their reach and effectiveness. Moreover, a comprehensive assessment will be conducted on MTCT elimination foundations using the WHO's validation toolkit [17]. This includes auditing data completeness across antenatal, neonatal, and immunisation registries; verifying laboratory quality assurance for HBsAg and HBV DNA testing; evaluating service accessibility and uptake disparities; and assessing community awareness and stigma barriers. The evidence demonstrating the achievement of all WHO process and impact targets will then be compiled to support formal application for validation of MTCT elimination.

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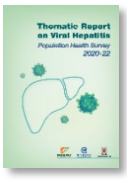
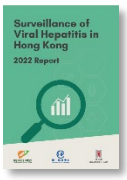
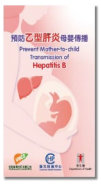
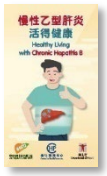
Useful resources

Description of materials	Hyperlink	QR code	Cover
Thematic Report on Viral Hepatitis (Population Health Survey 2020-22)	https://www.hepatitis.gov.hk/english/health_professionals/files/Thematic_Report_on_Viral_Hepatitis_Full_report.pdf		
Surveillance of Viral Hepatitis in Hong Kong - 2022 Report	https://www.hepatitis.gov.hk/english/health_professionals/surveillance_reports.html		
Hong Kong Viral Hepatitis Action Plan 2025 - 2030	https://www.hepatitis.gov.hk/doc/action_plan/Hong_Kong_Viral_Hepatitis_Action_Plan_2025-2030_eng.pdf		
Pamphlet – Prevent Mother-to-child Transmission of Hepatitis B	https://www.hepatitis.gov.hk/tc_chi/resources/files/Prevent_Mother_to_child_Transmission_of_Hepatitis_B.pdf		
Pamphlet – Stop maternal transmission of hepatitis B	https://www.hepatitis.gov.hk/tc_chi/resources/files/Stop_Maternal_Transmission_of_Hepatitis_B.pdf		
Pamphlet – Post-Vaccination Serologic Testing	https://www.hepatitis.gov.hk/tc_chi/resources/files/Post_Vaccination_Serologic_Testing_for_Babies_Born_to_Mothers_Infected_with_Hepatitis_B_Virus.pdf		
Poster – Prevention of perinatal hepatitis B	https://www.hepatitis.gov.hk/tc_chi/resources/files/Prevention_of_Perinatal_Hepatitis_B_Poster.pdf		
Poster – Stop maternal transmission of hepatitis B	https://www.hepatitis.gov.hk/tc_chi/resources/files/Stop_Maternal_Transmission_of_Hepatitis_B_Poster.pdf		

Updates of the elimination status of MTCT of HBV in Hong Kong

Video of "Stop mother-to-child transmission to realise a hepatitis B-free generation"	https://www.youtube.com/watch?v=5_FFuOKVVb4&feature=youtu.be		
Presentation Slides – Stop Mother-to-child Transmission of Hepatitis B (only Chinese version available)	https://www.hepatitis.gov.hk/tc_chi/resources/files/stop_MTCT.pdf		
Pamphlet – What You Need to Know about Hepatitis B	https://www.hepatitis.gov.hk/tc_chi/resources/files/What_you_need_to_know_about_Hepatitis_B.pdf		
Pamphlet – Healthy Living with Chronic Hepatitis B	https://www.hepatitis.gov.hk/tc_chi/resources/files/Healthy_Living_with_Chronic_Hepatitis_B.pdf		
Pamphlet – Hepatitis B Vaccine	https://www.hepatitis.gov.hk/tc_chi/resources/files/Hepatitis_B_Vaccine.pdf		
Poster – Hepatitis B Can Cause Cancer Get Tested and Treated Early	https://www.hepatitis.gov.hk/tc_chi/resources/files/Hepatitis_B%20can_cause_cancer_Get_tested_and_treated_early_poster.pdf		
Poster - Hepatitis B Vaccination	https://www.hepatitis.gov.hk/tc_chi/resources/files/Hepatitis_B_Vaccine_Poster.pdf		

Test paper

Please submit the completed answer sheet within the validity period by email to hepatitis@dh.gov.hk.

CME/CPD: 0.5-1.0* *(Validity for CME/CPD until 31 December 2026; accreditation for the period of 1 January 2027 – 20 April 2027 is pending.)*

CNE: 1.0

CEM (healthcare related): 1.0

Validity Period: 21 April 2026 – 20 April 2027

College/ Programme	CME/ CPD Point	CME/CPD Category
Anaesthesiologists	1*	RC-NA
Community Medicine	1*	PP-PP
Dental Surgeons	1*	OA-SS
Emergency Medicine	1*	CME-SS
Family Physicians[2]	1*	OEA-5.02
Obstetricians and Gynaecologists	1*	PP-PP
Ophthalmologists	N/A	N/A
Orthopaedic Surgeons	1*	PP-B
Otorhinolaryngologists	0.5*	PP-2.2
Paediatricians	1*	A-AP
Pathologists	1*	CME-SS
Physicians	1*	SS-SO
Psychiatrists#	1*	SS-OL
Radiologists	1*	B-SSB
Surgeons	1*	CME-PP
MCHK CME Programme for Practising Doctors who are not taking CME Programme for Specialists	1	Passive (Accredited by DH)
Medical Laboratory Technologists Board	1	N/A

Please contact respective authorities directly for CME/CPD accreditation if it is not listed above.

[2] Participated HKCFP members are suggested to apply accreditation directly to HKCFP through additional accreditation (post-accreditation) with supporting documents

The passing score for College of Psychiatrists is 8 out of 10.

* Validity for CME/CPD until 31 December 2026; accreditation for the period of 1 January 2027 – 20 April 2027 is pending.

Updates of the elimination status of MTCT of HBV in Hong Kong

1. As derived from the results of Population Health Survey 2020-22, what was the HBsAg prevalence in the general population of Hong Kong?
   A. 0.6%
   B. 5.6%
   C. 10.6%
   D. 15.6%
   E. 20.6%

2. Which of the following is the main cause regarding the burden of chronic HBV infection in Hong Kong?
   A. Infection acquired at infancy or during early childhood
   B. Infection acquired through sharing needles among people who inject drugs
   C. Infection acquired through sexual contact
   D. Infection acquired through transfusion of contaminated blood products
   E. Infection acquired through occupational exposure

3. Which of the following is **NOT** a correct description about the implementation of the interventions for prevention of MTCT of HBV in Hong Kong?
   A. Universal antenatal screening for HBsAg has been in place since the 1980s.
   B. Universal neonatal hepatitis B vaccination has been implemented since 1988.
   C. Hepatitis B immunoglobulin has been administered to all newborn babies at birth since the 1980s.
   D. The initiative of using antivirals to prevent MTCT was rolled out to all birthing hospitals in Hospital Authority in 2020.
   E. The initiative of post-vaccination serologic testing was introduced in 2022.

4. Which of the following is **NOT** a correct description about the implementation situation regarding the use of antivirals to prevent MTCT of HBV?
   A. Pregnant women receiving antenatal care in the public sector and screened positive for HBsAg will also undergo HBV DNA test.
   B. Those with high HBV viral load in the public sector would be referred to hepatology clinics and dedicated nurse-led clinics for assessment, counselling and initiation of antiviral prophylaxis by the third trimester
   C. About 15% of pregnant women tested positive for HBsAg were identified with high viral loads.
   D. More than 95% of pregnant women tested positive for HBsAg attended physician consultations.

E. More than half of the pregnant women identified with high viral load refused receiving antiviral treatment.

5. Which of the following is **NOT** a correct description about the implementation situation of the initiative of post-vaccination serologic testing (PVST)?
   A. In January 2022, the PVST programme commenced, where babies born to mothers with HBV infection in April 2021 or thereafter would be referred for serologic testing after completing the primary series of the three-dose hepatitis B vaccination.
   B. The PVST initiative confirms a high effectiveness of hepatitis B vaccination, where about 95% of babies were identified to be sero-protected after the primary vaccination series.
   C. The acceptance of the PVST has increased markedly, rising from 78.0% in 2022 to over 95% in 2024.
   D. More than 10% of babies joining the PVST programme were identified with inadequate sero-protection after the primary series of hepatitis B vaccination.
   E. Clinical review of the babies diagnosed with chronic hepatitis B in the PVST programme found that none of their mothers received maternal antiviral prophylaxis.

6. For countries providing universal timely hepatitis B birth-dose vaccination to all neonates, what is the impact target for HBV EMTCT?
   A. Achieving ≤ 0.01% HBsAg prevalence among the ≤ 5-year-old birth cohort
   B. Achieving ≤ 0.1% HBsAg prevalence among the ≤ 5-year-old birth cohort
   C. Achieving ≤ 1% HBsAg prevalence among the ≤ 5-year-old birth cohort
   D. Achieving ≤ 2% HBsAg prevalence among the ≤ 5-year-old birth cohort
   E. Achieving ≤ 5% HBsAg prevalence among the ≤ 5-year-old birth cohort

7. Which of the following data is **NOT** used for the estimation of HBsAg prevalence in children ≤5 years in Hong Kong?
   A. MTCT rate of HBV among babies born to HBsAg-positive mothers obtained from the PVST programme
   B. Territory-wide sero-surveys conducted among pre-school children
   C. HBsAg prevalence among antenatal women
   D. Risk of HBV infection for the children born to HBsAg-negative mothers reported in the literature
   E. Findings from mathematical modelling results

8. For countries providing universal timely hepatitis B birth-dose vaccination to all neonates, what is the process/ programmatic targets for HBV EMTCT?
   A. ≥ 50% third-dose hepatitis B vaccine coverage and ≥ 50% hepatitis B birth-dose vaccination coverage
   B. ≥ 60% third-dose hepatitis B vaccine coverage and ≥ 60% hepatitis B birth-dose vaccination coverage
   C. ≥ 70% third-dose hepatitis B vaccine coverage and ≥ 70% hepatitis B birth-dose vaccination coverage
   D. ≥ 80% third-dose hepatitis B vaccine coverage and ≥ 80% hepatitis B birth-dose vaccination coverage
   E. ≥ 90% third-dose hepatitis B vaccine coverage and ≥ 90% hepatitis B birth-dose vaccination coverage

9. Which of the following is **NOT** a correct description about the coverage of hepatitis B vaccination in Hong Kong?
   A. The coverage of hepatitis B birth-dose vaccination has been exceeding 99% since 2010.
   B. The latest coverage of hepatitis B birth-dose vaccination has met the process/ programmatic target for HBV EMTCT.
   C. The coverage of hepatitis B birth-dose vaccination has been impacted by the COVID-19 pandemic with more than 5% reduction in the coverage, as compared with that in the 2010s
   D. The coverage of hepatitis B third-dose vaccination has been exceeding 90% for children born in 1995 or thereafter.
   E. The latest coverage of hepatitis B third-dose vaccination has met the process/ programmatic target for HBV EMTCT.

Updates of the elimination status of MTCT of HBV in Hong Kong

10. Which of the following is **NOT** a correct description about the way forward regarding MTCT of HBV in Hong Kong?
    A. Prevention of MTCT of HBV is no longer a strategic action for minimising and eliminating new HBV infections in *Hong Kong Viral Hepatitis Action Plan 2025-2030*.
    B. A comprehensive assessment will be conducted on MTCT elimination foundations using the WHO's validation toolkit.
    C. Auditing data completeness across antenatal, neonatal, and immunisation registries, verifying laboratory quality assurance for HBsAg and HBV DNA testing, evaluating service accessibility and uptake disparities, and assessing community awareness and stigma barriers will be carried out.
    D. The evidence demonstrating the achievement of all WHO process and impact targets will be compiled to support formal application for validation of MTCT elimination.
    E. Future efforts will be dedicated to maintain core interventions - antenatal screening, neonatal vaccination, immunoglobulin administration, and maternal antiviral prophylaxis.