

Release Date: 2 July 2024

Expiration Date: 31 December 2025

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

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## **Prevalence of chronic hepatitis B in Hong Kong**

### **Introduction**

Hepatitis B virus (HBV) infection causes a significant public health burden in Hong Kong. The majority of the HBV disease burden was due to its chronic infection. If untreated, 15-40% chronic hepatitis B (CHB) patients can progress to cirrhosis and hepatocellular carcinoma (HCC) [1]. Prevalence estimates help to estimate the burden on the health-care system, future treatment needs and mortality associated with cirrhosis and HCC [2].

In general, information on the prevalence of chronic infection is obtained from three types of data sources, including (a) reporting of chronically infected patients from health-care facilities, (b) biomarker surveys and (c) making use of specimens collected for other purposes (e.g. blood donations and pregnant women attending antenatal care services) [2]. The following summarises the latest findings from major population-based seroprevalence studies and surveillance data collated for assessing chronic HBV infection in sentinel groups in Hong Kong, which have mostly been reported in the annual *Report on Surveillance of Viral Hepatitis in Hong Kong* [3].

### **Seroprevalence of HBV infection in the general population**

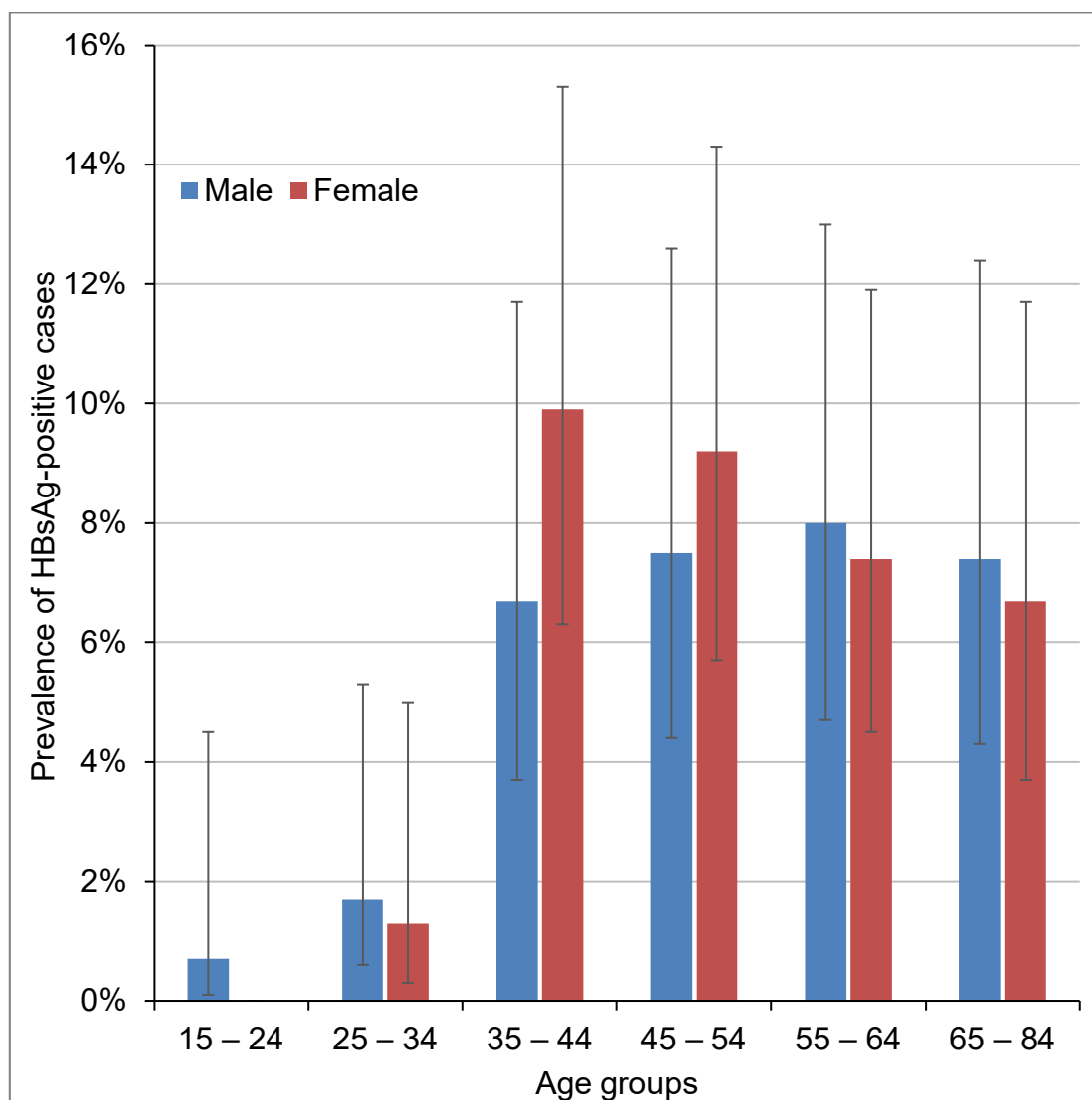
The Population Health Survey (PHS) 2020-22 was the latest territory-wide study assessing the seroprevalence of HBV infection in the general population, which gauged an age- and sex-adjusted prevalence of hepatitis B surface antigen (HBsAg) at 6.2% among land-based non-institutional population aged 15 - 84 in Hong Kong, excluding foreign domestic helpers and visitors [4]. As derived from the survey results, about 5.6% of the Hong Kong population, which is about 410 000 people, have hepatitis B.

The PHS 2020-22 also provided updated information on age and sex distribution of the HBsAg seroprevalence (Figure 1). HBsAg prevalence was much higher in older adults, as compared with those aged below 35. While less than 1% of population aged below 35 were HBsAg-positive due to universal childhood immunisation launched in November 1988 in Hong Kong, the prevalence in older age groups ranged between 7.0% and 8.4%, lower than but comparable to the historical

### Prevalence of chronic hepatitis B in Hong Kong

prevalence in 1970s at about 10% [5].

In contrast, there was a significant reduction in the HBsAg prevalence among the younger adults aged below 35, suggesting the implementation of a series of interventions initiated in 1980s for preventing mother-to-child transmission (MTCT) of HBV was effective in reducing the prevalence of HBV infection in the younger generation in Hong Kong.



**Figure 1.** Prevalence of HBsAg-positive cases (with 95% confidence interval bars), by sex and age group, among participants of Population Health Survey 2020-22

The PHS 2020-22 finding is largely consistent with another seroprevalence study conducted in 2018-20, which showed an adjusted HBsAg prevalence at 6.3% among the general population of all ages [6]. Both surveys suggested a further reduction of HBsAg prevalence in the general population, as compared with that found in

## **Prevalence of chronic hepatitis B in Hong Kong**

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Community Research Project on Viral Hepatitis (CRPVH) 2001 (8.8%) [3] and a territory-wide seroprevalence study conducted in 2015-16 (7.2% after adjustment for age and sex) [7]. As observed from these previous seroprevalence studies, chronic HBV infection is in a general declining trend in community groups without apparent risk of contracting HBV.

While chronic HBV infection appeared to be commoner in male than female in the general population in the past [7], the recent two seroprevalence studies did not find statistically significant difference in HBsAg prevalence between two sexes [4, 6].

It is also worth noting that, among the PHS participants tested positive for HBsAg, nearly 40% were not aware of their chronic hepatitis B status. Moreover, about 70% of HBsAg-positive participants of the PHS did not have any medical follow-up for their liver diseases.

### **Seroprevalence of children**

Universal childhood hepatitis B vaccination programme has been in place in Hong Kong since 1988 to reduce the risk of MTCT of HBV. This has resulted in a substantial decline in the HBV infection and prevalence in the younger generation.

In 2009, an HBsAg seroprevalence study was conducted among 1 913 children aged 12 to 15 years who were born after the implementation of universal neonatal hepatitis B vaccination programme [8]. The seroprevalence of HBsAg was 0.78% (95% CI: 0.39 - 1.16%). This result showed that Hong Kong had already achieved a time-bound goal set by the Western Pacific Regional Office (WPRO) of the World Health Organization, which referred to reducing chronic HBV infection rate to less than 2% among children at least 5 years of age by the year of 2012. In July 2011, Hong Kong was verified by WPRO as having successfully achieved the goal of HBV control. Based on the same study, Hong Kong was also verified as of June 2013 as having met the goal of achieving a seroprevalence of less than 1% among children.

To further reduce the risk of MTCT of hepatitis B, pregnant women with a high HBV viral load have been offered antiviral treatment since August 2020 in all birthing hospitals under the Hospital Authority (HA). Starting from January 2022, the DH and HA collaborated to implement post-vaccination serologic testing (PVST) programme. Babies attending Maternal and Child Health Centres (MCHC) of DH, who are born to mothers infected with HBV, are offered with tests for HBsAg and anti-HBs after completion of the primary hepatitis B vaccination series. Of 1 990 babies who received PVST in 2022 and 2023 after primary series of hepatitis B

## **Prevalence of chronic hepatitis B in Hong Kong**

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vaccination, 1886 (94.8%) were tested positive for anti-HBs, indicating seroprotection after the vaccination. 97 (4.9%) babies were tested negative for both anti-HBs and HBsAg, requiring the second series of hepatitis B vaccination. Seven (0.4%) babies were tested positive for HBsAg, showing that the HBV transmission risk among high-risk babies has become very low in Hong Kong.

### **Seroprevalence of HBsAg in different communities**

In addition to the aforementioned territory-wide seroprevalence studies, seroprevalence of HBsAg in different communities are monitored continuously and the various adult communities can be categorised into three groups according to the risk of contracting HBV:

- (a) without apparent risk: blood donors, pre-marital/ pre-pregnancy service users, antenatal women, police officers, new health care workers;
- (b) with undetermined risk: tuberculosis patients; and
- (c) with apparent risk: drug users, people living with HIV, men who have sex with men (MSM) and female sex workers.

#### ***(a) Seroprevalence of adult communities without apparent risk***

Blood tests from pregnant women attending antenatal care services, which could be used as a proxy for the general population of women of reproductive age (15 – 49 years), have long been an important source of HBsAg prevalence data [2]. The HBsAg prevalence in antenatal mothers has been decreasing from over 10% in the early 1990s to 2.4% in 2023 (Figure 2) [3, 9].

As reported from previous studies, the overall HBsAg prevalence in antenatal mothers could be confounded by the place of birth. A study of 2 480 pregnant women attending MCHC of DH in 1996 found an HBsAg prevalence at 13.1% in those born in mainland China as compared to 8.4% in local mothers [10]. Data from Virus Unit, DH also showed a higher prevalence of 12.5% and 13.8% in the subset of non-resident expectant mothers versus the overall positivity rate of 8.5% and 8.6% in 2004 and 2005 respectively.

Moreover, the prevalence of HBsAg among antenatal mothers also varied significantly by age. The HBsAg prevalence among antenatal mothers younger than 25 years has been dropping to a low level (about 1%) in 2023, as compared with those aged 35 years or above (about than 4%). The age-specific prevalence is in line

## **Prevalence of chronic hepatitis B in Hong Kong**

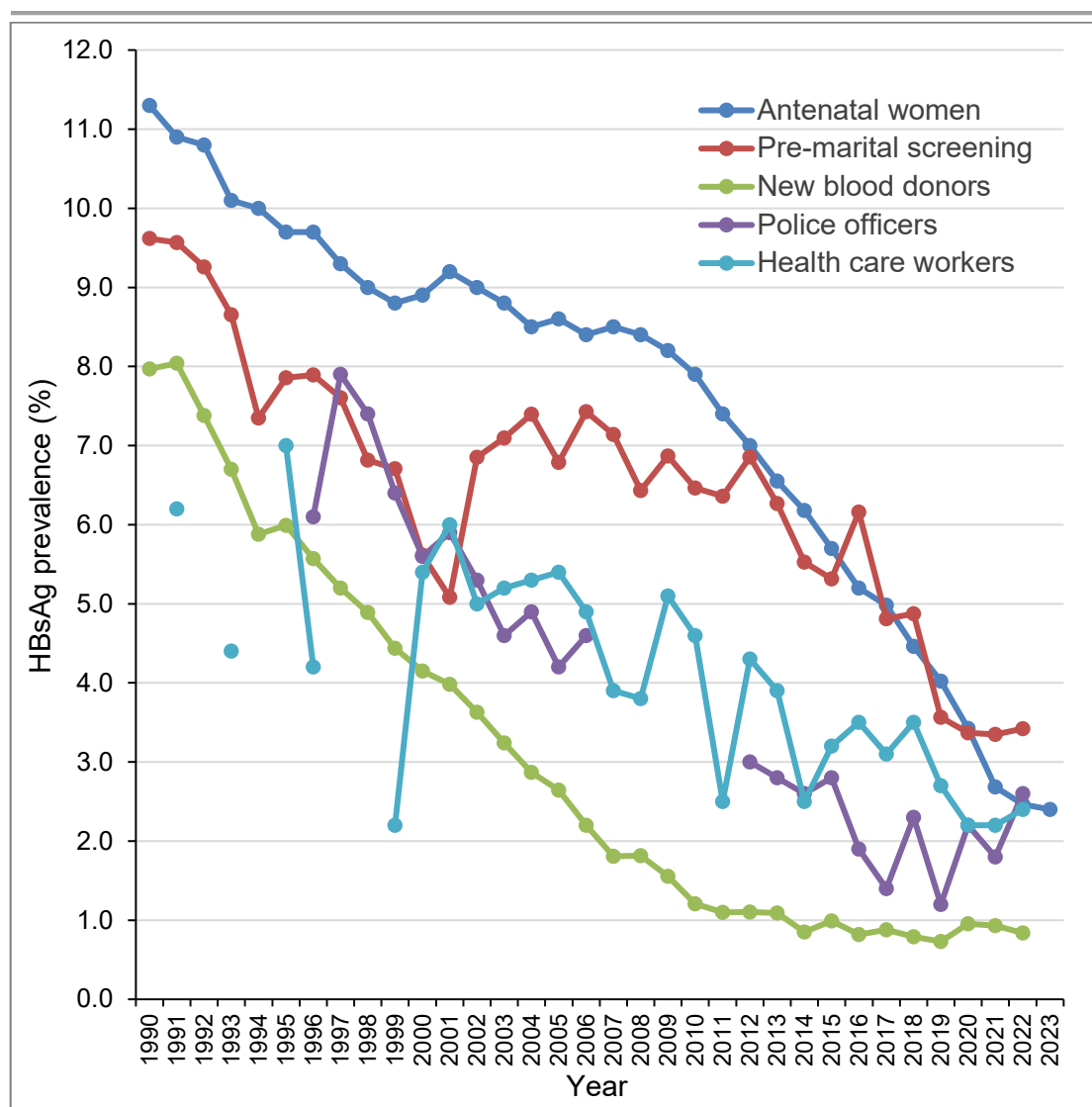
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with the findings in a retrospective cohort study, involving 10 808 young pregnant women aged 25 years or below born in Hong Kong and managed at a local hospital between 1998 and 2011 [11]. The HBsAg prevalence in the study ranged between 2.3% and 8.4%, with a significantly lower prevalence among those being born in and after 1984 (Odds ratio [OR]: 0.68, 95% CI: 0.58 - 0.80), when hepatitis B vaccination was given to neonates born to HBsAg-positive mothers.

Similar to the pattern observed in antenatal women, the HBsAg prevalence of users of pre-marital check-up in The Family Planning Association of Hong Kong (FPAHK) decreased from 9.6% in 1990 to 6.5% in 2010 (Figure 2). The prevalence has further dropped to 3.4% in 2022 among pre-marital or pre-pregnancy package service users.

In other community groups without apparent HBV risk, a falling trend of HBsAg prevalence was generally observed (Figure 2). The temporal decline of chronic HBV infection has been most obvious in new blood donors. For new blood donors, the HBsAg prevalence follows a continual falling trend since early 1990s, from 8.0% in 1990 to 0.8% in year 2022. The trend is even more obvious among the 16 - 19 years age group where the prevalence was as low as 0.20% in male and 0.12% in female in 2022. A similar trend was observed among police officers and newly recruited health care workers, whom HBsAg prevalence, as determined at pre-HBV-vaccination screening, was regularly reported to the DH for surveillance purposes. For police officers, the HBsAg prevalence fell from 7.9% in 1997 to 2.6% in 2022, with a prevalence of 1.8% among those aged 30 or less. A generally decreasing trend of the HBsAg prevalence in newly recruited health care workers was also observed, from 6.0% in 2001 to 2.4% in 2022.

### Prevalence of chronic hepatitis B in Hong Kong

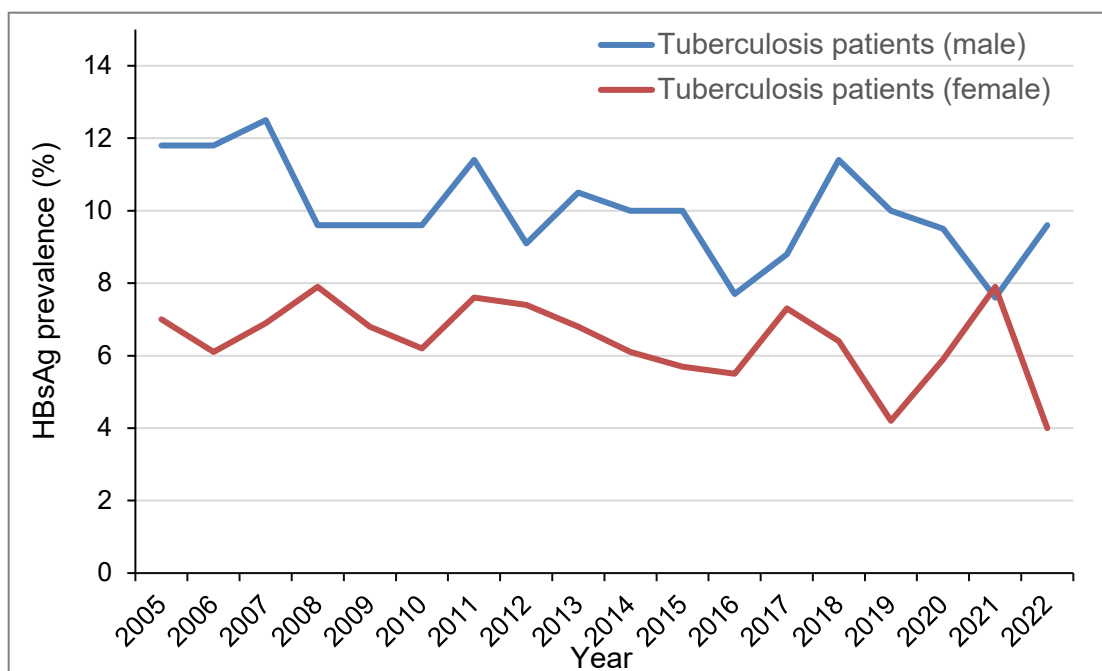


**Figure 2.** Prevalence of HBsAg in adult communities without apparent risk (Data source: Department of Health, Hong Kong Red Cross Blood Transfusion Service and The Family Planning Association of Hong Kong)

#### *(b) Seroprevalence of adult communities with undetermined risk*

Since 2005, data on HBsAg prevalence in tuberculosis (TB) patients attending Tuberculosis & Chest Clinics, DH between March and May have been reported each year for surveillance purposes. In 2022, 44 (7.3%) patients were detected HBsAg positive, with the highest prevalence rate in the middle age group (40 - 59 years old: 9.8%) followed by the more elderly group ( $\geq 60$  years old: 8.0%). The HBsAg positivity rate was higher in male clients than in female clients, where HBsAg prevalence was 9.6% in males and 4.0% in females respectively in 2022 (Figure 3). Both the age and gender patterns were rather consistent over the years. Overall, the HBsAg prevalence ranged between 6.9% and 10.5% among TB patients between 2005 and 2022, slightly higher than that in the general population. Knowingly, the majority (40% – 56%) of TB patients were indeed aged 60 or above.

### Prevalence of chronic hepatitis B in Hong Kong

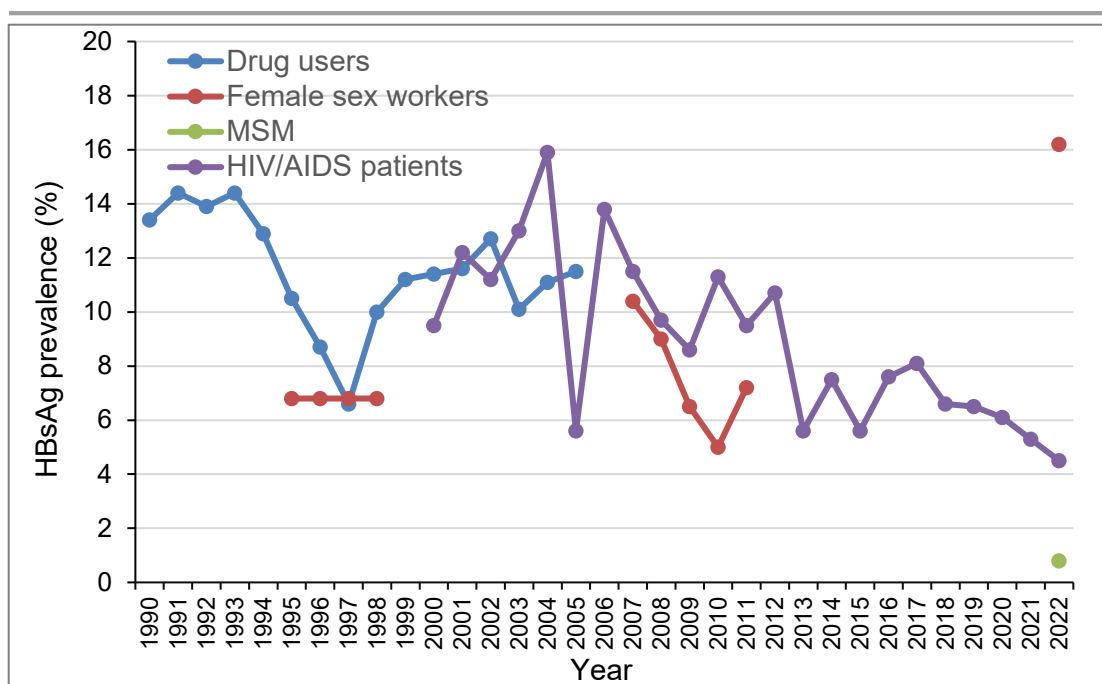


**Figure 3.** Prevalence of HBsAg in tuberculosis patients (Data source: Tuberculosis and Chest Service, DH)

#### *(c) Seroprevalence of adult communities with apparent risk*

The HBsAg prevalence in people living with HIV under care of DH was in the range of 4.5% to 8.1% in the past decade, reduced from the more than 10% prevalence in the early 2000s (Figure 4). The HBsAg prevalence was highest among those who were drug users (15.1%), while the lowest HBsAg prevalence was observed in heterosexual female (5.4%). Due to underlying immunosuppression and shared routes of transmission, people living with HIV are more likely to be chronically infected with HBV [12].

### Prevalence of chronic hepatitis B in Hong Kong



**Figure 4.** Prevalence of HBsAg in adult communities with apparent risk (Data source: multiple sources)

Since April 2022, all MSM and sex workers attending Social Hygiene Clinics (SHC) of DH are offered with HBV and hepatitis C virus (HCV) screening as part of the comprehensive sexually transmitted infection (STI) screening. Between August and December 2022, the HBsAg prevalence in female sex workers attending SHC of DH was 16.2% (6/37), and 64.7% (22/34) were tested positive for anti-HBs among HBsAg-negative female sex workers. The HBsAg prevalence observed in the screening initiative appeared to be higher than previous measurement among those attending the clinic of Action for REACH OUT tested between 2007 and 2011 (5.0% - 10.4%) and those attending Yaumatei SHC between 1995 and 1998 (6.8%) (Figure 4) [3]. On the other hand, the HBsAg prevalence in MSM attending SHC of DH was lower at 0.8% (4/489), while 39.5% (192/486) were tested positive for anti-HBs among HBsAg-negative MSM. It should be noted that age and other socio-demographic characteristics might have shed light on the difference in HBsAg and anti-HBs prevalence between these two risk groups, aside the high-risk behaviours being engaged by them. In general, MSM were much younger than sex workers were among SHC clients, and more likely to be covered by the hepatitis B immunisation programme.

There has been a programme involving the monitoring of the patterns of hepatitis B markers in drug users registering with drug rehabilitation services. A majority of these clients were from methadone clinic attendees. Before 2006, the annual prevalence of HBsAg in drug users was shown to be exceeding 10%, except for the year 1996 and 1997 (Figure 4). Nevertheless, the data regarding prevalence of



## Prevalence of chronic hepatitis B in Hong Kong

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HBsAg in drug users was difficult to interpret because of the small number of subjects (< 20) since 2006.

### Conclusion

The latest territory-wide survey (PHS 2020-22) found a further reduction of HBsAg prevalence in the general population, implying that Hong Kong has been shifting from a region of high endemicity of hepatitis B ( $\geq 8\%$  HBsAg prevalence) to intermediate-high endemicity (5 – 7.9 % HBsAg prevalence) [13]. Such declining trend of HBsAg prevalence was also in line with the patterns observed from other seroprevalence studies [6, 7], as well as the surveillance data among adults communities without apparent risk of HBV infection.

Comparison of HBsAg prevalence between adult communities with or without apparent risk of contracting HBV has not shown a prominent difference in the past decade. This observation suggests that the local prevalence of chronic HBV infection is mainly driven by MTCT of HBV. In Hong Kong. Following the implementation of universal antenatal HBsAg screening and childhood hepatitis B vaccination programme, as well as the administration of hepatitis B immunoglobulin for babies born to HBsAg-positive mothers, the prevalence of chronic HBV infection in the younger generation has been reduced. With the introduction of additional initiatives in the *Hong Kong Viral Hepatitis Action Plan 2020 – 2024 (the Action Plan)* [14], namely maternal antiviral prophylaxis for hepatitis B pregnant women with high HBV viral load and post-vaccination serologic testing for babies born to HBsAg-positive mothers, the risk of MTCT or transmission during early childhood is expected to be minimised further, drawing Hong Kong closer to the realisation of the goal of achieving a hepatitis B-free generation.

Notably, the HBsAg prevalence remains high in those aged 35 or above, who were born before the implementation of universal childhood immunisation programme in 1988. Understanding of this epidemiological pattern of chronic HBV infection would be crucial to inform population-based strategies for prevention and control of hepatitis B in Hong Kong, including reminding people at increased risk of HBV infection to test for hepatitis B for early identification and management of the disease.

## Prevalence of chronic hepatitis B in Hong Kong

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## **Prevalence of chronic hepatitis B in Hong Kong**

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## Prevalence of chronic hepatitis B in Hong Kong

### Useful resources

Description of materials	Hyperlink	QR code	Cover
Thematic Report on Viral Hepatitis (Population Health Survey 2020-22)	<a href="https://www.hepatitis.gov.hk/english/health_professionals/files/Thematic_Report_on_Viral_Hepatitis_Full_report.pdf">https://www.hepatitis.gov.hk/english/health_professionals/files/Thematic_Report_on_Viral_Hepatitis_Full_report.pdf</a>		
Surveillance of Viral Hepatitis in Hong Kong - 2022 Report	<a href="https://www.hepatitis.gov.hk/english/health_professionals/surveillance_reports.html">https://www.hepatitis.gov.hk/english/health_professionals/surveillance_reports.html</a>		
Presentation Slides – Focused Risk-based Testing for Chronic Hepatitis B Virus Infection	<a href="https://www.hepatitis.gov.hk/english/health_professionals/files/Focused_risk_based_HBV_screening_web.pdf">https://www.hepatitis.gov.hk/english/health_professionals/files/Focused_risk_based_HBV_screening_web.pdf</a>		
Video – Hong Kong Viral Hepatitis Action Plan 2020-2024	<a href="https://youtu.be/VaHs-DZWXEM">https://youtu.be/VaHs-DZWXEM</a>		
Video – Test Hepatitis B Save Your Life	<a href="https://www.youtube.com/watch?v=T8wMOQnMDM0">https://www.youtube.com/watch?v=T8wMOQnMDM0</a>		
Video – Hepatitis B Can Cause Cancer Get Tested and Treated Early	<a href="https://www.youtube.com/watch?v=E7k-SSmXXfY">https://www.youtube.com/watch?v=E7k-SSmXXfY</a>		
Pamphlet – What You Need to Know about Hepatitis B	<a href="https://www.hepatitis.gov.hk/tc_chi/resources/files/What_you_need_to_know_about_Hepatitis_B.pdf">https://www.hepatitis.gov.hk/tc_chi/resources/files/What_you_need_to_know_about_Hepatitis_B.pdf</a>		
Pamphlet – Healthy Living with Chronic Hepatitis B	<a href="https://www.hepatitis.gov.hk/tc_chi/resources/files/Healthy_Living_with_Chronic_Hepatitis_B.pdf">https://www.hepatitis.gov.hk/tc_chi/resources/files/Healthy_Living_with_Chronic_Hepatitis_B.pdf</a>		

**Prevalence of chronic hepatitis B in Hong Kong**

Pamphlet – Hepatitis B Vaccine	<a href="https://www.hepatitis.gov.hk/tc_chi/resources/files/Hepatitis_B_Vaccine.pdf">https://www.hepatitis.gov.hk/tc_chi/resources/files/Hepatitis_B_Vaccine.pdf</a>		
Poster – Hepatitis B Can Cause Cancer Get Tested and Treated Early	<a href="https://www.hepatitis.gov.hk/tc_chi/resources/files/Hepatitis_B%20can_cause_cancer_Get_tested_and_treated_early_poster.pdf">https://www.hepatitis.gov.hk/tc_chi/resources/files/Hepatitis_B%20can_cause_cancer_Get_tested_and_treated_early_poster.pdf</a>		
Poster - Hepatitis B Vaccination	<a href="https://www.hepatitis.gov.hk/tc_chi/resources/files/Hepatitis_B_Vaccine_Poster.pdf">https://www.hepatitis.gov.hk/tc_chi/resources/files/Hepatitis_B_Vaccine_Poster.pdf</a>		

## Prevalence of chronic hepatitis B in Hong Kong

### Test paper

Please submit the completed answer sheet within the validity period by email to [hepatitis@dh.gov.hk](mailto:hepatitis@dh.gov.hk).

CME/ CPD: 0.5-1

CNE: 1

Validity Period: 7 July 2024 – 31 December 2025

College/ Programme	CME/ CPD Point	CME/ CPD Category
Anaesthesiologists	1	PP-NA
Community Medicine	1	PP-PP
Dental Surgeons	Pending	Pending
Emergency Medicine	1	CME-PP
Family Physicians <sup>1</sup>	N/A	N/A
Obstetricians and Gynaecologists	1	PP-PN
Ophthalmologists	Pending	Pending
Orthopaedic Surgeons	1	PP-B
Otorhinolaryngologists	0.5	PP-2.2
Paediatricians	1	A-PP
Pathologists	1	CME-SS
Physicians	1	SS-SO
Psychiatrists	1	SS-OL
Radiologists	1	B-PP
Surgeons	1	CME-PP
<b>MCHK CME Programme for Practising Doctors who are not taking CME Programme for Specialists</b>	1	Passive (Accredited by DH)

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

<sup>1</sup> Participated HKCFP members are advised to submit application (additional accreditation) to college with supporting documents.

### Prevalence of chronic hepatitis B in Hong Kong

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1. In general, which of the following is / are common data source(s) for the information on the prevalence of chronic HBV infection?
  - A. Reporting of chronically infected patients from health-care facilities
  - B. Biomarker surveys
  - C. Making use of specimens collected for blood donations
  - D. Making use of specimens collected from pregnant women attending antenatal care services
  - E. All of the above.
  
2. 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. 1.6%
  - C. 5.6%
  - D. 10.6%
  - E. 20.6%
  
3. As derived from the results of Population Health Survey 2020-22, what was the estimated size of population living with hepatitis B?
  - A. 11 000
  - B. 41 000
  - C. 110 000
  - D. 410 000
  - E. 1 100 000
  
4. Which of the following is NOT a correct description about the findings from Population Health Survey 2020-22?
  - A. HBsAg prevalence was much higher in older adults aged 35 or above.
  - B. Among the PHS participants tested positive for HBsAg, nearly 40% of them were not aware of their chronic hepatitis B status.
  - C. Less than 1% of population aged below 35 were HBsAg-positive.
  - D. There was a significant reduction in the HBsAg prevalence among the younger adults aged below 35.
  - E. There was a statistically significant difference in HBsAg prevalence between two sexes.

### Prevalence of chronic hepatitis B in Hong Kong

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5. As implied by the results of Population Health Survey 2020-22, what is current level of hepatitis B endemicity for Hong Kong?
- A. High
  - B. Intermediate-high
  - C. Intermediate-low
  - D. Low
  - E. Undetermined
6. Which of the following is NOT a correct description about the HBsAg seroprevalence in children?
- A. In 2009, a study found a seroprevalence of HBsAg at 0.78% among 1 913 children aged 12 to 15 years, who were born after the implementation of universal neonatal hepatitis B vaccination programme.
  - B. Hong Kong was verified as of June 2013 as having met the goal of achieving a seroprevalence of less than 1% among children.
  - C. The post-vaccination serologic test (PVST) programme implemented since 2022 found an HBsAg prevalence at 0.4% among babies born to mothers infected with HBV.
  - D. The findings from the PVST programme suggest the HBV transmission risk among high-risk babies remains very high in Hong Kong.
  - E. Universal childhood hepatitis B vaccination programme implemented since 1988 has resulted in a substantial decline in the HBV infection and prevalence in the younger generation.
7. Which of the following is NOT a correct description about the HBsAg seroprevalence in adult communities without apparent risk?
- A. HBsAg prevalence in new blood donors has been consistently low at around 1% since 1990s.
  - B. The HBsAg prevalence in antenatal mothers has been decreasing from over 10% in the early 1990s to 2.4% in 2023
  - C. HBsAg prevalence has dropped to 3.4% in 2022 among pre-marital or pre-pregnancy package service users of The Family Planning Association of Hong Kong.
  - D. A declining trend was observed among police officers, as determined at pre-HBV-vaccination screening, where the HBsAg prevalence fell from 7.9% in 1997 to 2.6% in 2022.
  - E. The HBsAg prevalence in newly recruited health care workers, as determined at pre-HBV vaccination screening, was generally decreasing.



### Prevalence of chronic hepatitis B in Hong Kong

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8. Which of the following is NOT a correct description about the HBsAg seroprevalence in tuberculosis patients attending Tuberculosis & Chest Clinics, DH?
- A. In 2022, 7.3% of the TB patients were detected HBsAg positive.
  - B. The HBsAg prevalence in tuberculosis patients was comparable to that in the general population, as they carry similar age profile.
  - C. The highest HBsAg prevalence rate was observed in the middle age group (40 - 59 years old) followed by the more elderly group ( $\geq 60$  years old).
  - D. The HBsAg positivity rate was usually higher in male clients than in female clients.
  - E. Both the age and gender patterns were rather consistent over the years.
9. Which of the following is NOT a correct description about the HBsAg seroprevalence in adult communities with apparent risk?
- A. The HBsAg prevalence in people living with HIV under care of DH was in the range of 4.5% to 8.1% in the past decade, reduced from the more than 10% prevalence in the early 2000s.
  - B. Between August and December 2022, the HBsAg prevalence in female sex workers attending Social Hygiene Clinics of DH was 16.2%.
  - C. Between August and December 2022, the HBsAg prevalence in men who have sex with men attending Social Hygiene Clinics of DH was 0.8%.
  - D. Before 2006, the annual prevalence of HBsAg in drug users was exceeding 10%, except for the year 1996 and 1997.
  - E. HBsAg prevalence in adult communities with apparent risk of contracting HBV is a lot higher than that in adult communities without apparent risk of infection in the past decade.
10. Which of the following is NOT an existing preventive measure(s) for MTCT of HBV in Hong Kong?
- A. Universal antenatal HBsAg screening
  - B. Universal childhood hepatitis B vaccination programme
  - C. Administration of hepatitis B immunoglobulin for babies born to HBsAg-positive mothers
  - D. Provision of antiviral treatment to neonates born to HBsAg-positive mothers as post-exposure management
  - E. Maternal antiviral prophylaxis for hepatitis B pregnant women with high HBV viral load