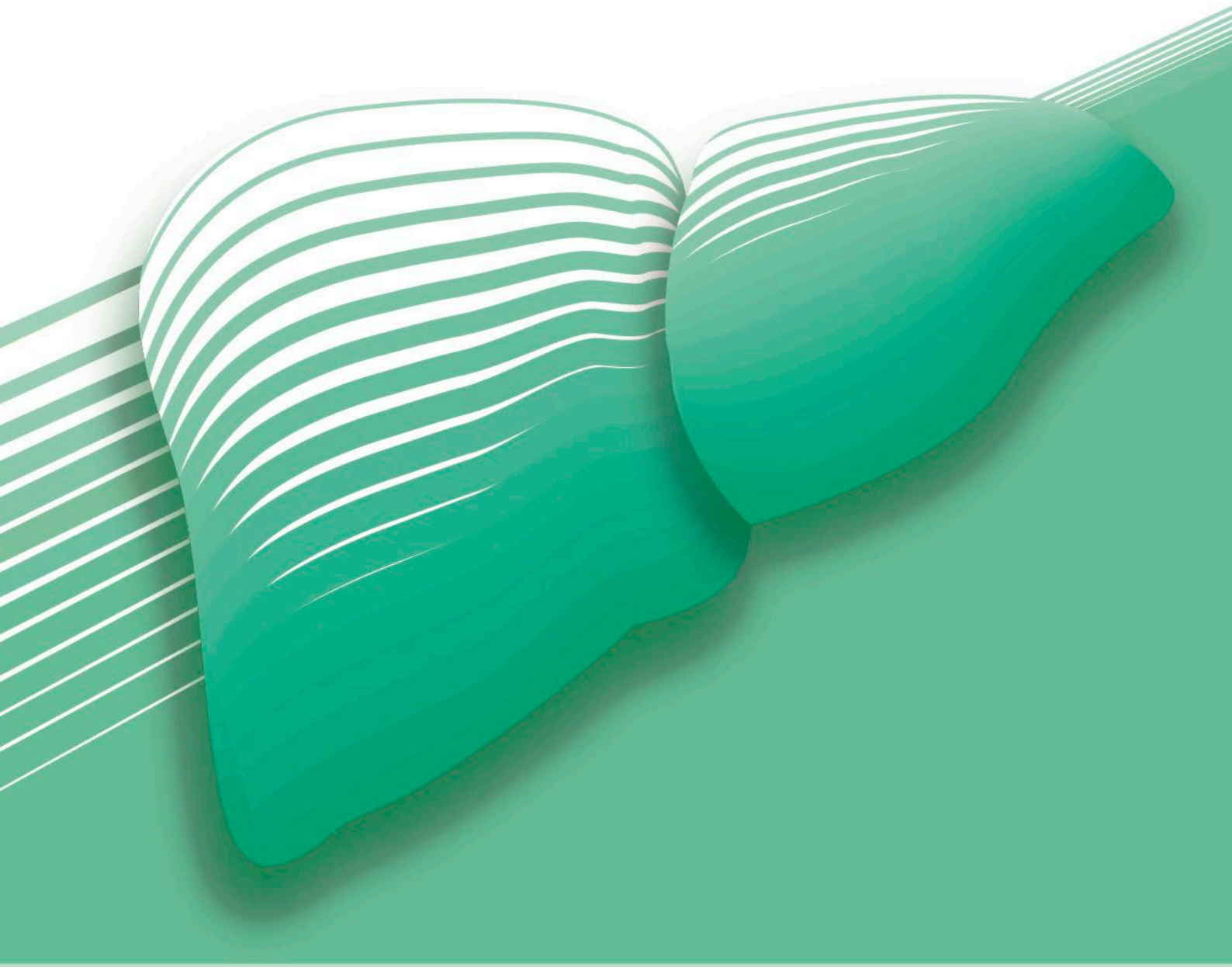
Hong Kong Viral Hepatitis Action Plan

2020 - 2024



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This publication has been translated into Chinese. If there is any inconsistency or ambiguity between the English version and the Chinese version, the English version shall prevail.

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Foreword

Prof. Sophia CHAN Siu-chee, JP
Secretary for Food and Health

Hepatitis is common in Hong Kong, particularly hepatitis B. There are at least five viruses that can cause infective hepatitis. They are namely hepatitis A, B, C, D and E viruses. Hepatitis A and E are transmitted by contaminated food and water, while hepatitis B, C and D are transmitted by blood or body fluids. Viral hepatitis can cause liver diseases. In particular, hepatitis B and C lead to chronic diseases in hundreds of millions of people and, together, are the most common cause of liver cirrhosis, cancer and viral hepatitis-related deaths.

Globally, it is estimated that about 257 million and 71 million people are living with chronic hepatitis B and C virus ("HBV and HCV") infection respectively. Epidemiological studies gauged a prevalence of 7.2% and 0.3% for HBV and HCV infection respectively in local population, amounting to about 540 000 HBV cases and 22 000 HCV cases.

The Government recognises the burden posed by viral hepatitis. Since 1988, hepatitis B vaccination has been provided to all newborns. In 1992, a one-off exercise was launched to cover all pre-school children born between 1 January 1986 and 14 November 1988. In addition, hepatitis B vaccination has been made available to the healthcare workforce and high-risk patient groups.

Since then, Hong Kong has evolved from a region of high-intermediate to intermediate-low hepatitis B endemicity, while the local prevalence of hepatitis C has remained low generally over the past decades. Although much has been done to prevent HBV and HCV infections with significant improvement in the local prevalence of hepatitis B, including universal blood safety programme, safe injection practice in healthcare facilities and neonatal hepatitis B immunisation programme, there is no room for complacency. There exist service gaps in

identifying those who are unaware of their infection status, and in making them aware of the effective medical treatment available to them.

The World Health Organization ("WHO") promulgated the *Global health sector strategy on viral hepatitis 2016 - 2021*, which outlines a global goal of eliminating viral hepatitis as a major public health threat by 2030. In recognition of the public health threat posed by viral hepatitis, the Government announced in the *2017 Policy Address* to set up a steering committee to formulate strategies to prevent and control viral hepatitis effectively. The Steering Committee on Prevention and Control of Viral Hepatitis ("SCVH") was established in July 2018 to advise the Government on the overall policy, targeted strategies and effective resource allocation related to the prevention and control of viral hepatitis. The Government also committed in the *2019 Policy Address* that, the SCVH would formulate an action plan in 2020, with a view to reducing the public health burden posed by viral hepatitis.

Thanks to the dedicated work of the SCVH, this *Hong Kong Viral Hepatitis Action Plan 2020 - 2024* provides the first road map to coordinate efforts of stakeholders in various sectors in reducing the public health burden of viral hepatitis in Hong Kong. This Action Plan outlines the overall strategies and specific actions to be taken, as well as measurable targets and indicators, to facilitate monitoring of the implementation of the Action Plan.

This is now time for the Government, the Hospital Authority, the academia and the civil society to work more closely together to drive the progress towards achieving the goal of the WHO and eliminating viral hepatitis as a major public health threat in Hong Kong by 2030.

Preface

Dr. Constance CHAN Hon-yee, JP
Director of Health

Viral hepatitis is a global public health problem affecting the lives of millions of people. In Hong Kong, it is estimated that around 540 000 people and 22 000 people are chronically infected with hepatitis B and hepatitis C virus respectively. Chronic hepatitis is a silent killer. People who suffer from the infections may be asymptomatic for many years until they are presented with cirrhosis and liver cancer. This results in missed opportunities to seek and receive the appropriate treatment.

The commitment of the Government to meet the World Health Organization (WHO) goal of eliminating viral hepatitis as a major health threat by 2030 has led to the formulation of this Action Plan, spelling out details on how it would be delivered.

We have engaged with various stakeholders to step up our coordinated efforts by adopting the WHO's four-axis framework of action: awareness, surveillance, prevention and treatment, with the aim of reducing transmission of viral hepatitis and the morbidity and mortality attributed to it.

Much has already been achieved in preventing the transmission of viral hepatitis, especially hepatitis B, in Hong Kong since the 1980s. In order to realise an "HBV free generation", there is still a lot of work to be done to provide the necessary quality and timely care. It would not be possible without the commitment from the Government and the hard work and dedication of healthcare staff.

The success of the plan requires concerted effort from various sectors. It is time to join hands to achieve viral hepatitis elimination!

Dr. Tony KO Pat-sing
Chief Executive, Hospital Authority

Chronic hepatitis by viral hepatitis B or C remains a territory-wide health issue of Hong Kong. Without proper linkage to care and monitoring, many will develop serious complications including cirrhosis, hepatocellular carcinoma and liver failure, which in turns add to the ever-rising demand of the healthcare system. The Hospital Authority (HA) has been working closely with the Department of Health in planning and implementing initiatives in order to achieve the goals set out by the World Health Organization.

To augment the capacity in managing patients with viral hepatitis, HA will continue to strengthen ourselves in various aspects including manpower, equipment, laboratory support and drug. Hepatitis nurse clinics have been set up to alleviate pressure of specialist outpatient clinics and clinical pathway to prevent mother-to-child transmission of hepatitis B virus was established. In addition, HA has gradually widened the coverage of direct-acting antivirals in order to treat all patients with chronic hepatitis C. To facilitate management of patients in the community setting in the long run, collaboration between specialists and primary care physicians will be explored.

To tie in with HA's mission of "Helping People Stay Healthy", this action plan will improve patient access to viral hepatitis treatment and care, ultimately increasing the cure rate of hepatitis C and preventing the progression and development of complications for hepatitis B.

Addressing the challenges of chronic viral hepatitis will require continuous collaboration among different stakeholders from both the public and private healthcare sectors. Through our dedication and collective effort in implementing the action plan, let us join hands targeting to make Hong Kong free from chronic viral hepatitis in the foreseeable future.

Executive Summary

This Action Plan sets out the strategic plan to reduce the burden of chronic hepatitis B and hepatitis C in Hong Kong through effective prevention, treatment and control of viral hepatitis.

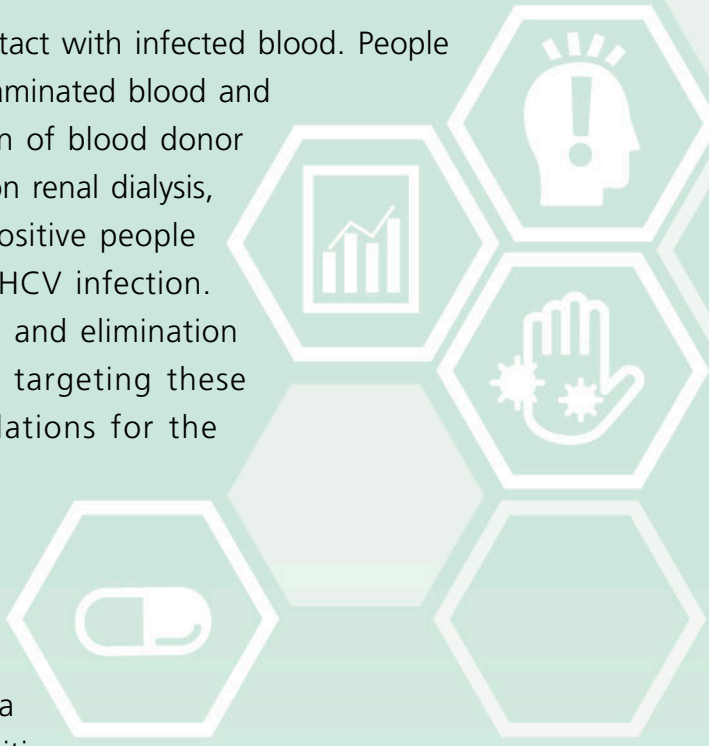
Viral hepatitis poses a significant public health burden worldwide, leading to an estimated 1.34 million deaths in 2015. Most of the deaths were attributed to the sequelae of chronic infection with hepatitis B virus (HBV) or hepatitis C virus (HCV), including liver cancer, cirrhosis and other chronic liver diseases. Globally, an estimated 257 million and 71 million people were living with chronic HBV and HCV infection respectively.

In Hong Kong, epidemiological studies gauged a prevalence of 7.2% and 0.3% for HBV and HCV infection respectively in the general population, amounting to about 540 000 HBV cases and 22 000 HCV cases. Many of them are asymptomatic and unaware of their infection. Without treatment, the chronic infection can span several decades and lead to cirrhosis and liver cancer. Annually, there are around 1 500 - 1 600 registered deaths from liver cancer, which is the third leading cause of cancer deaths in Hong Kong and mostly associated with hepatitis B and C.

HBV infection is a vaccine-preventable disease; universal immunisation programme for babies launched in 1988 has resulted in substantial decline in the incidence of HBV infection in the younger generation. However, mother-to-child transmission (MTCT) of HBV is still of concern, as 90 percent of HBV-infected newborns will develop chronic infection and may suffer from related complications in the

subsequent decades of lives. It is therefore important to focus efforts on prevention of MTCT of HBV and treatment of people with chronic HBV infection.

HCV is primarily spread through contact with infected blood. People who were given transfusion of contaminated blood and blood products before the institution of blood donor screening for HCV in 1991, people on renal dialysis, people who inject drugs and HIV-positive people are at substantially higher risk for HCV infection. Curative treatment is now available and elimination of HCV is made possible through targeting these disproportionately affected populations for the diagnosis and treatment of HCV.



As endorsed in World Health Assembly in 2016, the *Global health sector strategy on viral hepatitis, 2016 - 2021* outlines a global goal of eliminating viral hepatitis as a major public health threat by 2030. The strategy provides a set of global impact targets, which refers to achieving a reduction of 90% in incidence and 65% in mortality by 2030, as compared with the baseline in 2015. It also includes a number of service coverage targets on key interventions, including (i) hepatitis B vaccination, (ii) prevention of MTCT of HBV, (iii) harm reduction, (iv) blood safety, (v) injection safety, (vi) diagnosis of hepatitis B and C, and (vii) treatment of hepatitis B and C.

In recognition of the public health threat posed by viral hepatitis, the Hong Kong Government announced in the 2017 Policy Address the setting up of a steering committee to formulate strategies to prevent and control viral hepatitis. Since the establishment of the Steering Committee on Prevention and Control of Viral Hepatitis (SCVH) in July 2018, the SCVH have been tasked to advise the Government on the overall policy, targeted strategies and effective resource allocation related to the prevention and control of viral hepatitis, and with a view to formulating an action plan. In 2020, the SCVH formulated this *Hong Kong Viral Hepatitis Action Plan 2020 - 2024*, providing a comprehensive strategy for reducing the public health burden of viral hepatitis in Hong Kong.

To eliminate viral hepatitis as a public health threat, this Action Plan has its Vision and Goals -

- Vision – where new viral hepatitis infections have ceased, and where everyone with chronic viral hepatitis has access to effective and affordable care and treatment; and

- Goals – reducing transmission of viral hepatitis, as well as morbidity and mortality due to viral hepatitis

This Action Plan adopts four strategic axes, as described in the World Health Organization (WHO) framework for global action: awareness, surveillance, prevention and treatment. Priority actions in each axis to be carried out in 2020 – 2024 for progressing towards the 2030 WHO targets of viral hepatitis elimination have been developed as follows.

This Action Plan outlines specific actions for Department of Health, Hospital Authority and other stakeholders, as well as the timelines for the implementation of the actions. Targets and indicators have also been developed to facilitate monitoring and evaluation of the implementation of this Action Plan and to drive the progress towards reaching the WHO 2030 goals of eliminating HBV and HCV infection.

We urge everyone to support the Action Plan and join hands to make Hong Kong free of chronic viral hepatitis.

This Action Plan is a milestone towards significantly reducing the burden of chronic hepatitis B and hepatitis C, with the ultimate vision to render Hong Kong free of chronic viral hepatitis.

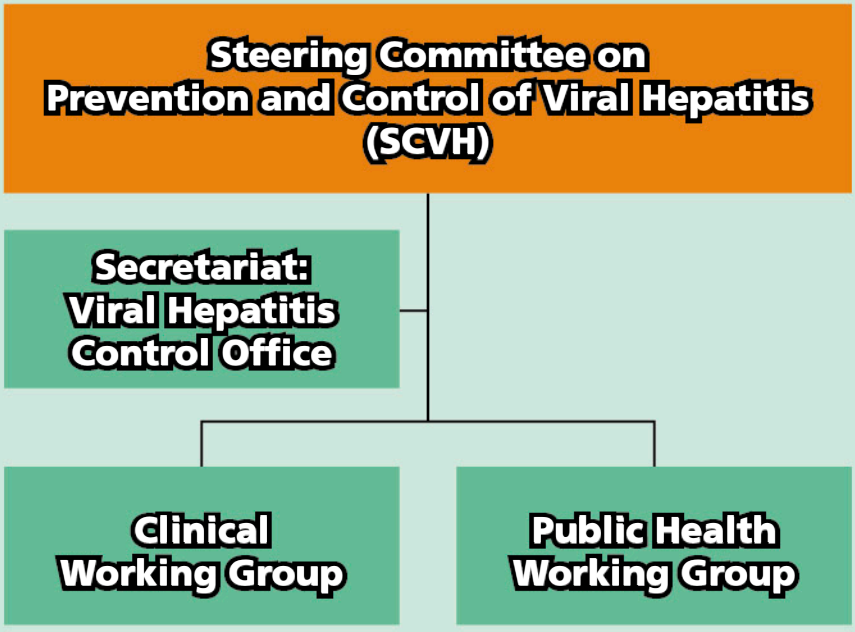
This Action Plan

The Hong Kong Government has all along recognised the public health importance of viral hepatitis. The Government announced in the 2017 Policy Address the setting up a steering committee to formulate strategies to prevent and control viral hepatitis effectively.

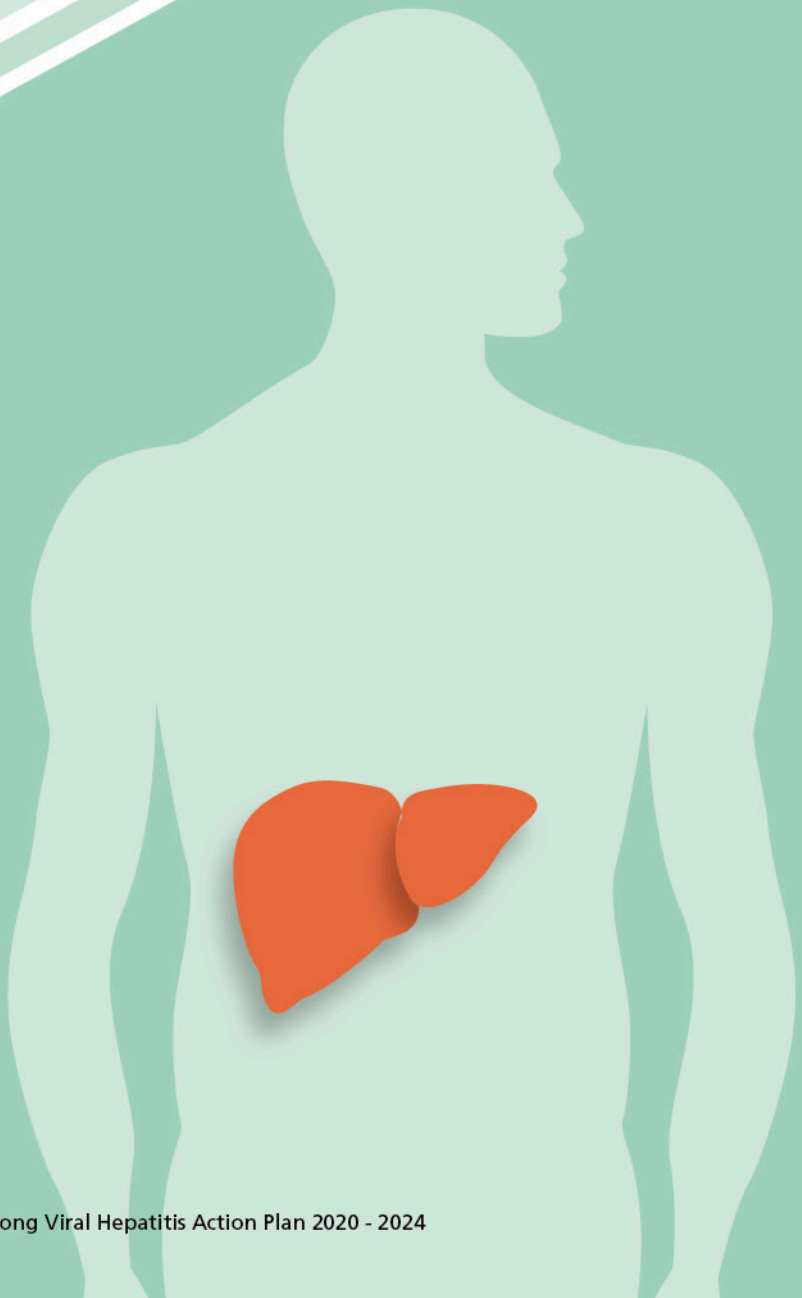
Co-chaired by the Director of Health and the Chief Executive of the Hospital Authority, the **Steering Committee on Prevention and Control of Viral Hepatitis (SCVH)** was established in July 2018. Appointed by the Secretary for Food and Health, membership comprises representatives of academia and experts of different medical specialties, and representatives of the Food and Health Bureau, the Centre for Health Protection of the Department of Health and the Hospital Authority (See Annex II).

The SCVH is tasked to review local and international trends and developments in the prevention and control of viral hepatitis; advise the Government on overall policy, targeted strategies and effective resource allocation related to prevention and control of viral hepatitis; as well as conduct and coordinate the monitoring and evaluation of viral hepatitis control and recommend appropriate response. With the valuable advice from members who are renowned experts and academics specialising in viral hepatitis, the SCVH has formulated this Action Plan.

While high-level deliberations and broad-based strategies are important aspects of the work of the SCVH, the groundwork of frontline assessment, formulation and implementation is also essential. Sizeable overlap notwithstanding, the effort to control viral hepatitis consists of mainly a public health and a clinical approach. Therefore, two working groups have been formed under the SCVH. The Public Health Working Group is convened by the Consultant of Viral Hepatitis Control Office, Department of Health, while the Clinical Working Group is convened by the Chief Manager (Quality and Standards), Hospital Authority. The terms of reference and membership of the working groups are depicted in Annex III and IV respectively.



Introduction



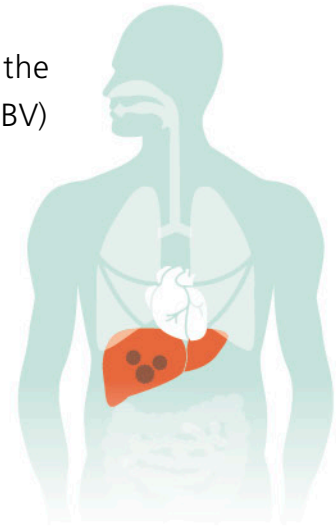
Overview of HBV and HCV infection

- Transmission of HBV and HCV
- Acute HBV and HCV infection
- Chronic HBV and HCV infection
- Diagnosis
- Vaccine
- Antiviral treatment

WHO targets

Local situation

- Surveillance of viral hepatitis
- Epidemiology of hepatitis B
- Epidemiology of hepatitis C
- Liver cancer
- Care continuum



1. **Viral Hepatitis** is an inflammatory condition of the liver caused by virus. Infection with hepatitis B virus (HBV) and hepatitis C virus (HCV) is present worldwide and a leading cause of liver-related morbidity and mortality. Both can cause chronic or lifelong infection with serious and fatal complications and constitute most of the disease burden associated with viral hepatitis [1].

2. Globally, viral hepatitis caused 1.34 million deaths in 2015 and 96% of these deaths were due to the sequelae of HBV or HCV infections [2]. An estimated 257 million people, or 3.5% of the population, were living with chronic HBV infection in the world in 2015, while an approximate 1% of the world population, or 71 million people, were living with HCV infection.

257 million infected with hepatitis B

71 million infected with hepatitis C

3. Prevalence of HBV infection was the highest in the African and Western Pacific regions, accounting for 68% of those infected. Compared with HBV, the prevalence of HCV infection was more heterogeneously distributed, with differences across and within World Health Organization (WHO) regions and countries.

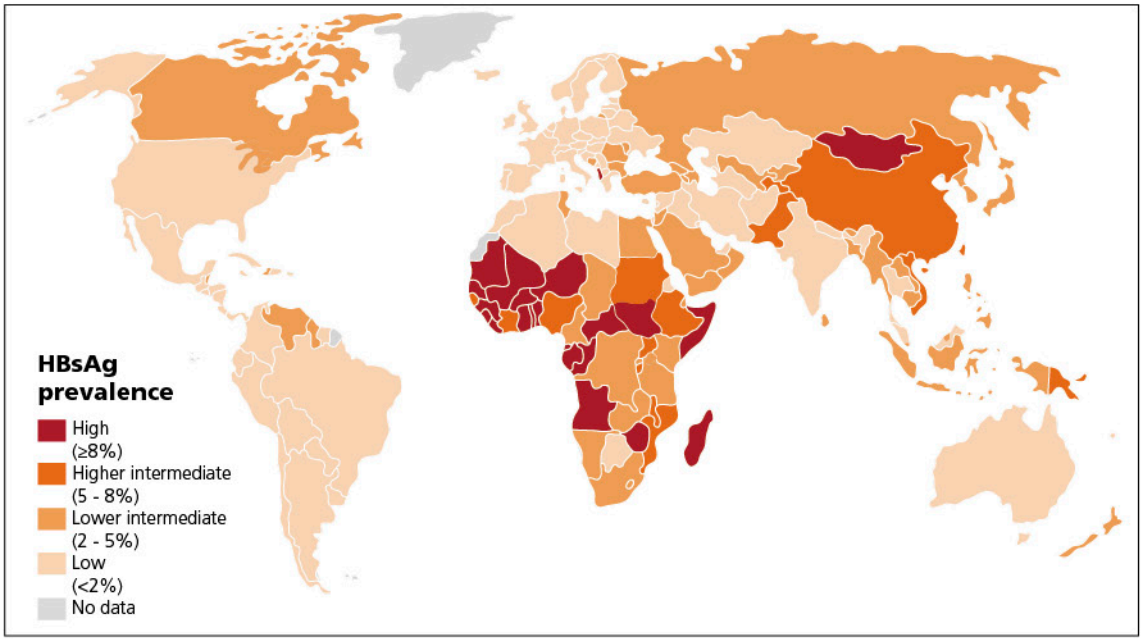


Figure 1. Global prevalence of HBV infection
(Source: WHO)

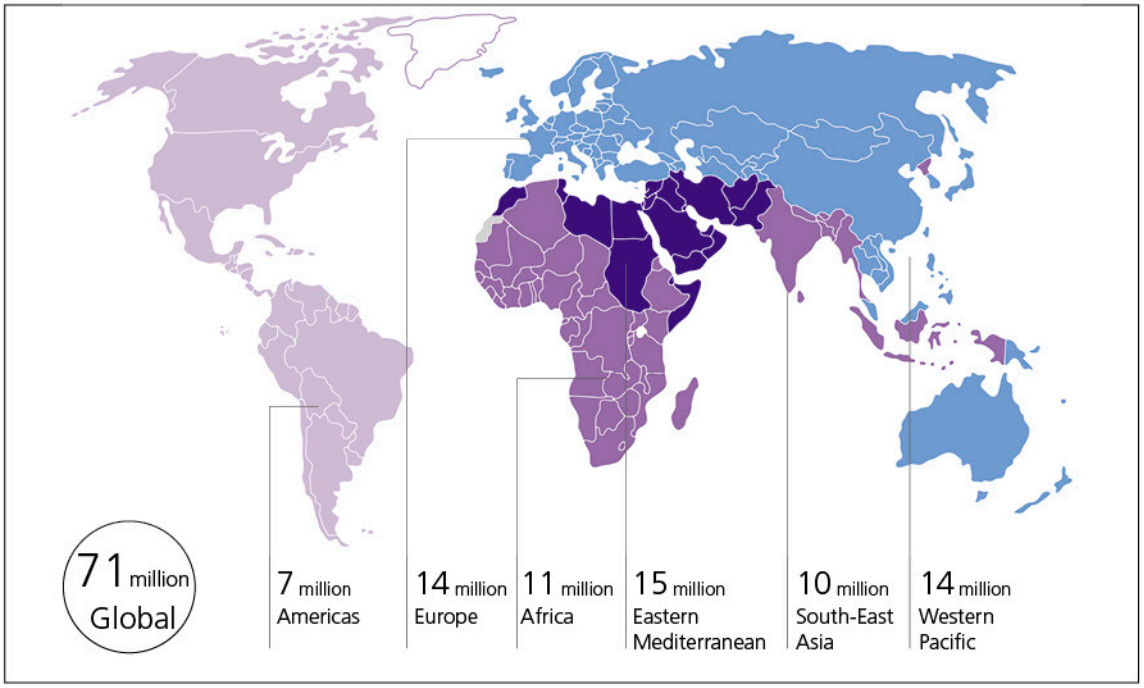


Figure 2. Number of people having HCV infection
(Source: WHO)

Overview of HBV and HCV infection

4. The epidemic of HBV and HCV infections is characterised by their transmission modes, disease progression and availability of vaccine and anti-viral treatment for disease prevention and management. An understanding of HBV and HCV epidemiology, given in the pursuing paragraphs, would support the formulation of strategies and priority setting for actions for controlling hepatitis B and C.

Transmission of HBV and HCV

5. Both HBV and HCV share similar modes of transmission, including **mother-to-child transmission (MTCT), sexual contact** and **contact with contaminated blood or body fluid**. However, the public health implications of these transmission modes differ significantly.

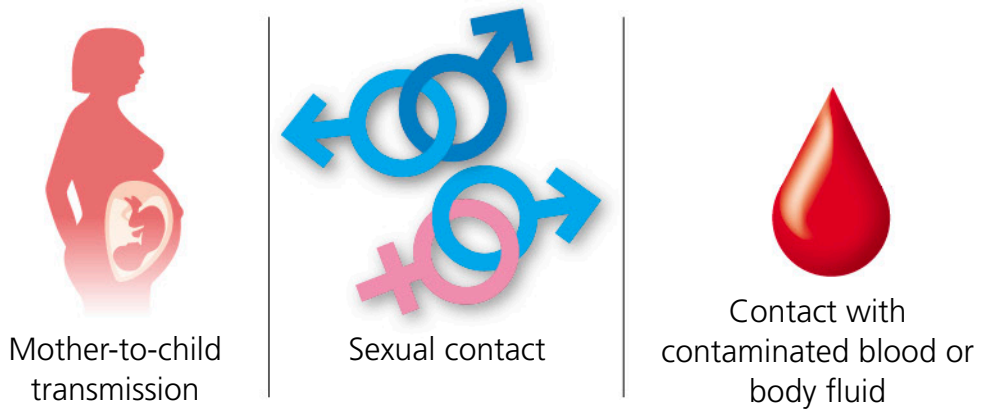


Figure 3. Routes of transmission of HBV and HCV

6. Most of the disease burden of HBV infection comes from infections acquired in infancy through perinatal or early childhood exposure to HBV, as an infection acquired at an early age is more likely to become a chronic infection [3]. In areas of high endemicity, MTCT of HBV is, therefore, the most common mode of transmission [4].

7. The predominant forms of transmission of HCV are unsafe therapeutic injections and blood transfusion in developing countries [5]. In developed countries, injecting drug use and unsafe sexual activities of people living with human immunodeficiency virus (HIV) infection are the main forms of transmission [6]. HCV epidemics related to injecting drug use occur in all WHO regions, with an estimated 60 - 80% of people who inject drugs (PWID) having been infected with HCV [7].

8. HCV can also be passed from an infected mother to her baby. The estimated risk of transmission of HCV from infected mothers to babies is about 4 - 8% when the mother is viraemic, and can be twofold to fourfold higher when she is co-infected with HIV [5].

Acute HBV and HCV infection

Most HBV and HCV infection are asymptomatic.

9. Most acute HBV or HCV infections go unnoticed and only a small subset of people may develop acute hepatitis disease.

- Symptomatic acute disease of HBV infection occurs in less than 10% of children aged 10 or below and in 30 - 50% of individuals infected after the age of 10 years [8].

- Following initial infection with HCV, approximately 80% of people do not exhibit any symptoms [9].

- The common symptoms of acute viral hepatitis are fever, jaundice, nausea, loss of appetite, vomiting, fatigue, upper abdominal discomfort, diarrhoea and tea-coloured urine.

Chronic HBV and HCV infection

10. A proportion of people infected with HBV and HCV will evolve into chronic infections.

- The risk of developing chronic infection with HBV depends on the age at which a person becomes infected: 90% among perinatal infections, 30 - 50% among young children aged five or below, and less than 5% in healthy adults [3].

- The development of chronicity following HCV infection is common, and about two thirds of acute infection will develop chronic infection [10].

11. Chronic HBV and HCV infection can persist for decades without symptoms. Many infected persons are not aware of their infection status and not seeking appropriate care and treatment. Untreated persons with chronic HBV or HCV infection may develop progressive scarring of the liver (cirrhosis) and primary liver cancer (hepatocellular carcinoma [HCC]), which are the major burden from viral hepatitis [11].

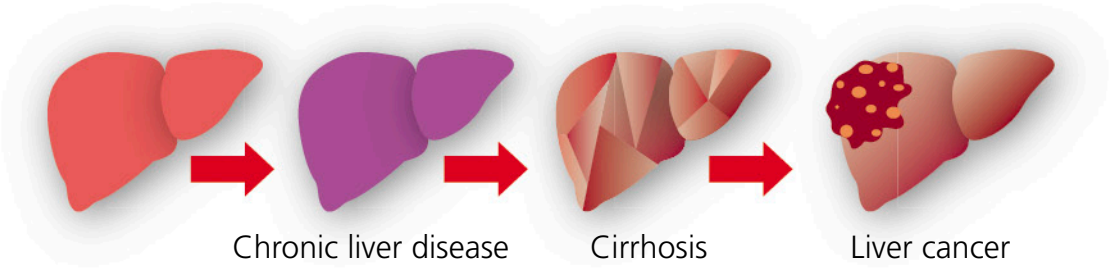
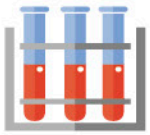


Figure 4. Progression of chronic viral hepatitis

12. Overall, the lifetime risk of developing HCC from 30 to 75 years, for men and women, was 27.38% and 7.99% in chronic hepatitis B patients, and 23.73% and 16.71% in chronic hepatitis C patients [12].

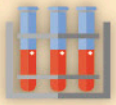
Diagnosis



13. HBV and HCV infection is diagnosed by blood test (Table 1).

Table 1. Blood test for diagnosing HBV and HCV infection

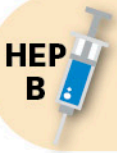
	Blood test	InterOpretation
HBV	Hepatitis B surface antigen (HBsAg)	A positive test result indicates an HBV infection. Chronic HBV infection is characterised by the persistence of HBsAg for at least 6 months.
HCV	HCV antibody (anti-HCV)	A positive result indicates past or present HCV infection. It cannot distinguish a current HCV infection from one that was cleared spontaneously or cured by treatment.
	HCV ribonucleic acid (RNA)	A positive result confirms an active HCV infection.



Blood test is required to diagnose HBV and HCV infection.

Vaccine

14. There are safe and effective vaccines for preventing HBV infection. A three-dose series of hepatitis B vaccine can induce protective antibody concentration in more than 95% of healthy babies, children and young adults [13]. Preventing HBV infection averts the development of complications including development of cirrhosis and liver cancer.



Safe and effective hepatitis B vaccine is available.

15. No vaccine is available for HCV infection.

Antiviral treatment

16. **Chronic HBV infection can be treated,** but not cured:

- Use of effective antivirals can inhibit the replication of HBV and reduce the risk of cirrhosis, liver failure, liver cancer and long-term complications of chronic HBV infection.

- However, the use of antivirals is unable to clear HBV completely, and life-long treatment is usually indicated in most patients.

17. **Chronic HCV infection can be cured:**

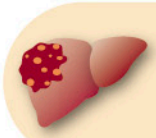
- A cure is associated with significant improvement in clinical outcomes, by reducing the risk of long-term complications such as cirrhosis and liver cancer. Therefore, in principle, all patients with chronic HCV infection can be treated and cured.

- Traditionally, treatment of HCV was based on interferon. However, interferon-based treatment is fraught with significant adverse effects that are difficult to manage, and the rate of treatment success is limited (40 - 70%), depending on the genotypes [14].

- Effective, well-tolerated and all-oral direct-acting antivirals (DAA) are now available and they can clear HCV in more than 90% of cases [15]. As stated in the updated WHO guidelines in 2018, the recommended therapy for chronic hepatitis C is pan-genotypic DAA, rather than interferon-based regimens [5].

Table 2. Chronic HBV and HCV infection at a glance

	Chronic HBV infection	Chronic HCV infection
Estimated number of cases globally	257 million people 3.5% of the population	71 million people 1% of the population
Mode of transmission	Blood-borne Mother-to-child transmission is the major route of transmission	Blood-borne In developed countries, injecting drug use and unsafe sexual activities of people living with HIV are the main modes of transmission
Symptoms	Mostly asymptomatic	Mostly asymptomatic
Diagnosis	Blood test: HBsAg	Blood test: anti-HCV; if positive, test HCV RNA
Lifetime risk of liver cancer if untreated	Male: 27% Female: 8%	Male: 24% Female: 17%
Vaccine	Safe and effective vaccine available	Not available
Treatment	Regular monitoring and consider antiviral drug	Curative antiviral treatment available



Both hepatitis B and C can cause chronic infection, cirrhosis, liver cancer and even deaths.

WHO targets

18. To address the disease burden in the region, the *Regional action plan for viral hepatitis in the Western Pacific 2016 - 2020* was approved by Members States at the 66th WHO Regional Committee for the Western Pacific and endorsed as part of Resolution WPR/RC66.R1 on 14 October 2015 [16].

19. *The Global health sector strategy on viral hepatitis, 2016 - 2021*, endorsed in the World Health Assembly in 2016, outlines a global goal of eliminating viral hepatitis as a major public health threat by 2030 [17]. The strategy provides a set of global targets, covering both **service coverage** and **impact** (incidence and mortality).

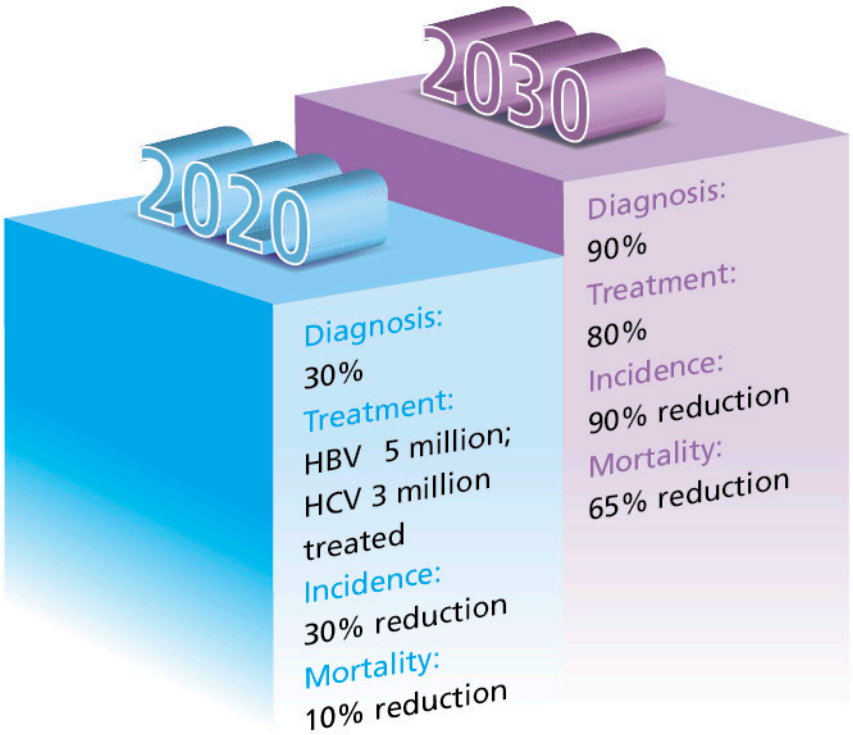


Figure 5. WHO 2030 impact targets and selected service coverage targets

20. A list of impact and service coverage targets is available in Table 3.

Table 3. Service coverage and impact targets in Global Health Sector Strategy on viral hepatitis

Target Areas	2020 Targets	2030 Targets
Service coverage targets		
Hepatitis B vaccination: childhood vaccine coverage (third dose coverage)	90%	90%
Prevention of HBV mother-to-child transmission: hepatitis B birth-dose vaccination coverage or other approach to prevent mother-to-child transmission	50%	90%
Blood safety: percentage of donations screened in a quality-assured manner	95%	100%
Safe injections: percentage of injections administered with safety-engineered devices in and out of health facilities	50%	90%
Harm reduction: number of sterile needles and syringes provided per person who injects drugs per year	200	300
Viral hepatitis B and C diagnosis	30%	90%
Viral hepatitis B and C treatment	The number of people receiving HBV and HCV treatment globally reaches 5 and 3 million respectively	80% of eligible persons with chronic HBV or HCV infection treated
Impact targets		
Incidence: New cases of chronic viral hepatitis B and C infections	30% reduction* (equivalent to 1% prevalence of HBsAg among children)	90% reduction* (equivalent to 0.1% prevalence of HBsAg among children)
Mortality: Viral hepatitis B and C deaths	10% reduction*	65% reduction*

* As compared with the baseline number in 2015

Local situation

Surveillance of viral hepatitis

21. Acute viral hepatitis is a statutory notifiable disease in Hong Kong. The Centre for Health Protection, Department of Health (DH) is responsible for the surveillance of communicable diseases, including acute viral hepatitis.

22. Seroprevalence of HBsAg regularly reported to DH includes those from new blood donors, pre-marital and pre-pregnancy services, antenatal women, police officers, new healthcare workers, clients seeking post-exposure management, tuberculosis patients and HIV/AIDS patients.

23. Seroprevalence data of HCV infection, which are reported to DH on a regular basis, include those from new blood donors, persons having needlestick injuries or mucosal contacts of blood and body fluids and HIV/AIDS patients attending Integrated Treatment Centre (ITC), and patients having clinical HCV testing in two hospital clusters.

Epidemiology of hepatitis B

24. In Hong Kong, most of the disease burden of HBV infection comes from infection acquired perinatally or during early childhood. Universal neonatal vaccination programme has been in place in Hong Kong since 1988. The coverage rate for three doses of hepatitis B vaccine among babies born locally is high (>98%).

25. Apart from universal neonatal hepatitis B vaccination programme, supplementary Primary 6 vaccination programme was introduced in 1998 and the coverage rate for three doses of hepatitis B vaccine had been consistently above 97%.

26. With the high coverage of hepatitis B vaccination programme, Hong Kong was verified by the WHO Western Pacific Regional Office (WPRO) in July 2011, as having successfully achieved the goal of hepatitis B control. In a study conducted by DH in 2009, an HBsAg seroprevalence at 0.78% was shown among more than 1 900 children aged between 12 and 15, who were born after the implementation of universal hepatitis B vaccination programme [18]. In 2013, Hong Kong was verified as having met the final regional control goal of achieving an HBsAg seroprevalence of less than 1% in children.

27. A general downward trend of HBsAg prevalence in populations without specific HBV risk, as well as the number of notified acute HBV infection, has been observed locally (Table 4) [19].

Hong Kong has gradually evolved from a region of high-intermediate to intermediate-low hepatitis B endemicity.

Table 4. Comparison of the number of notified cases and prevalence of HBV infection between 1990 and 2018

	1990	2018
Number of notified acute HBV infection	178	29
HBsAg prevalence		
New blood donors	8%	0.8%
Antenatal women	11.3%	4.5%
Pre-marital / pre-pregnancy screening clients	9.6%	4.9%

28. The latest territory-wide epidemiological study gave an age- and sex-adjusted prevalence of HBsAg at 7.2% [20], while the prevalence of HBV infection was estimated at 6.4% in 2016 in a modelling study [21]. With a population of 7.5 million, the estimated HBsAg prevalence at 7.2% actually amounts to around 540 000 cases of HBV infection.

Epidemiology of hepatitis C

29. In contrast with HBV, the local prevalence of hepatitis C has remained generally low. A 0.05% positivity rate of anti-HCV was detected from new blood donors in 2018 [19], reflecting the uncommon occurrence of HCV infection among the general population. The latest territory-wide epidemiological study also gave a low prevalence of viraemic HCV infection at 0.3% [20], while an estimated HCV prevalence at 0.2% in 2016 was found in a modelling study [22].

HCV in specific populations

30. Studies published in the early 1990s showed that anti-HCV was more commonly found in PWID (66.8%), haemophilia (56.0%), haemodialysis (4.6 - 18%) and other patients requiring frequent transfusions of blood or blood products [23,24].

31. With the introduction of HCV screening for blood donation in 1991, the rate of transfusion-transmitted HCV infections has reduced to a very low percentage.

32. Knowingly, the prevalence of HCV in PWID is high and PWID represent a large reservoir for transmission of HCV. An HCV seroprevalence study in 2006 conducted in methadone clinics, which provide methadone treatment to opiate abusers as part of the overall Government service for abusers, showed the prevalence of anti-HCV among PWID at 85% [25]. More recent studies involving PWID recruited at their gathering places gave an anti-HCV prevalence at similar level at 81.7% in 2011 and 76.4% in 2014 respectively [26,27]. Among the subjects participating in a targeted screening and assessment programme for ex-PWID between 2009 and 2018, 73.4% were found to be anti-HCV positive [28].

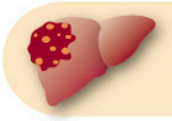
33. Another population disproportionately affected by HCV infection was HIV/AIDS patients. New HIV/AIDS patients attending ITC gave a prevalence of anti-HCV at baseline screening of 4.7% in 2018 [19]. Of these, HIV-positive men who have sex with men (MSM) have emerged as a risk group of sexually

transmitted HCV infection. It may be concurrently acquired with other sexually transmitted infections and associated with the use of recreational drugs for sex, so called chemsex. It now accounts for the majority of new reports of acute HCV infection in Hong Kong. Although its epidemiologic importance is still behind that of parenterally acquired HCV infection in PWID, it cannot be underestimated.

HCV genotypes

34. Six genotypes of HCV have been identified. Genotype 1b is the most prevalent one in Hong Kong (around 60%). Others include Genotype 6 (around 30%) and Genotype 3 (around 10%). Infections with other genotypes are diagnosed sporadically.

Liver cancer

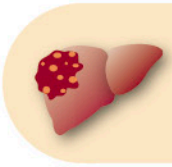


Worldwide, the most common risk factor for liver cancer is chronic HBV and HCV infection.

35. Globally 782 000 people died of liver cancer in 2018 [29], and HBV and HCV infection generally accounted for approximately 80% of liver cancer cases [11]. Local studies showed that 75 - 80% of hepatocellular cancers in Hong Kong were related to chronic HBV infection, and 3 - 6% of the cases were related to chronic HCV infection. HBV and HCV co-infection accounted for another 0.4 - 3% [30].

36. According to the data from the Hong Kong Cancer Registry [31], liver cancer, including neoplasm of liver and intrahepatic bile ducts, was **the 5th most common cancer and the 3rd leading cause of cancer deaths in 2017**:

- 1 834 newly registered cases of liver cancer
- 1 552 registered deaths from liver cancer



Liver Cancer in Hong Kong
• The 5th most common cancer
• The 3rd leading cause of cancer deaths

Care continuum

37. Care continuum of services for HBV and HCV infection spans the entire range of interventions – from reducing vulnerability and prevention, diagnosis and linkage to care, through to treatment and monitoring of disease and related complication. It provides a good framework for establishing a monitoring and evaluation system, with indicators measuring coverage and performance along each step of the "cascade". Key measurements include coverage for diagnosis and treatment for HBV and HCV infection.

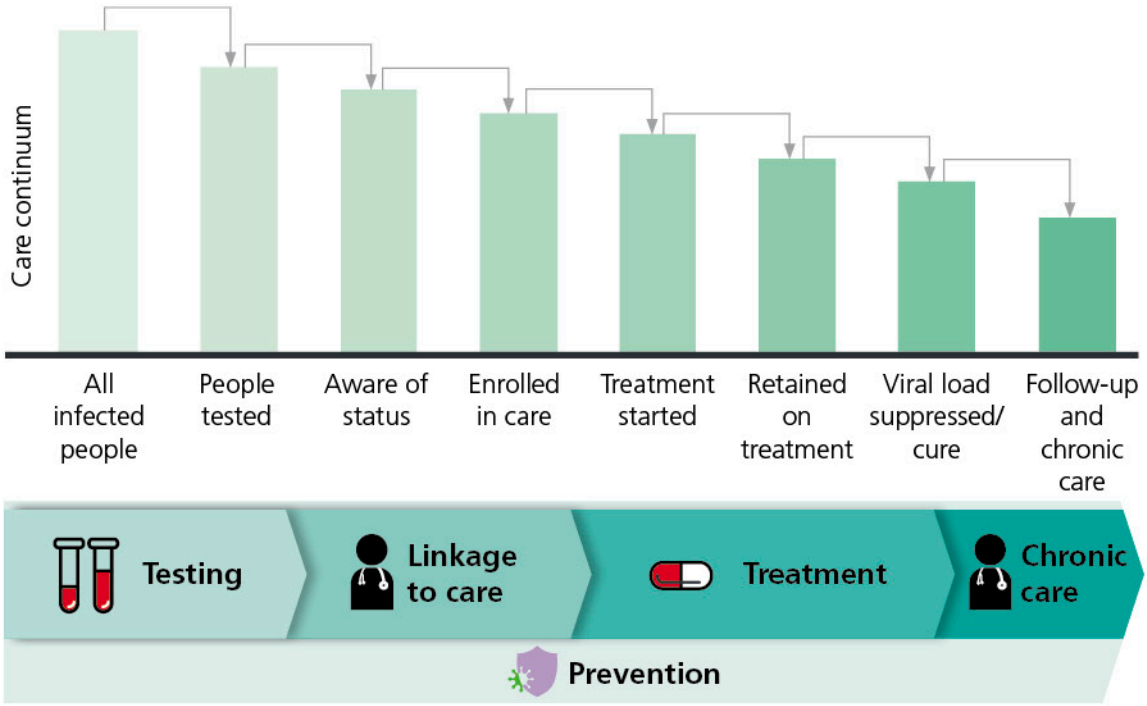


Figure 6. Care continuum of hepatitis services

HBV infection

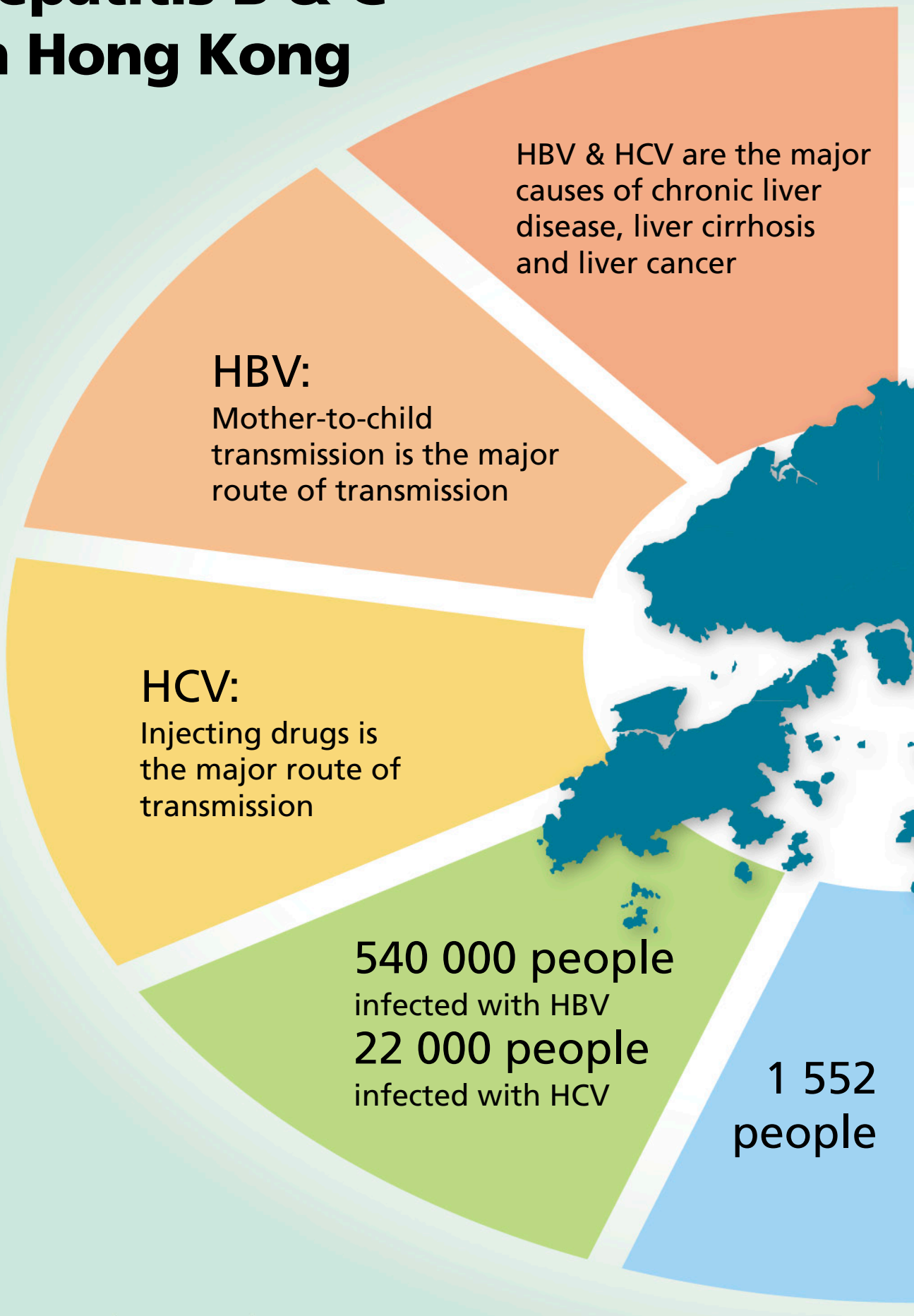
38. Access to diagnosis and treatment of hepatitis B in the community is still limited. In 2016, of the 257 million people living with HBV infection worldwide, 10.5% (27 million) were aware of their infection. Of those diagnosed, the global treatment coverage was 16.7% (4.5 million) [32]. In Hong Kong, close to 50% of the HBsAg-positive participants in an epidemiological study conducted in 2015 - 16 were not aware of their infection status [20]. As described, the latest territory-wide epidemiological study conducted in 2015 - 2016 gave an age- and sex-adjusted prevalence of HBsAg at 7.2%, which could be translated to around 540 000 chronic HBV infection in Hong Kong. As of the end of 2015, an estimated cumulative number of around 194 000 alive patients ever diagnosed with HBV infection in Hospital Authority (HA). A modelling study gave a much lower diagnosis rate for HBV infection at 27% in 2016, while an estimated 22% of those eligible for HBV treatment were being treated [21].

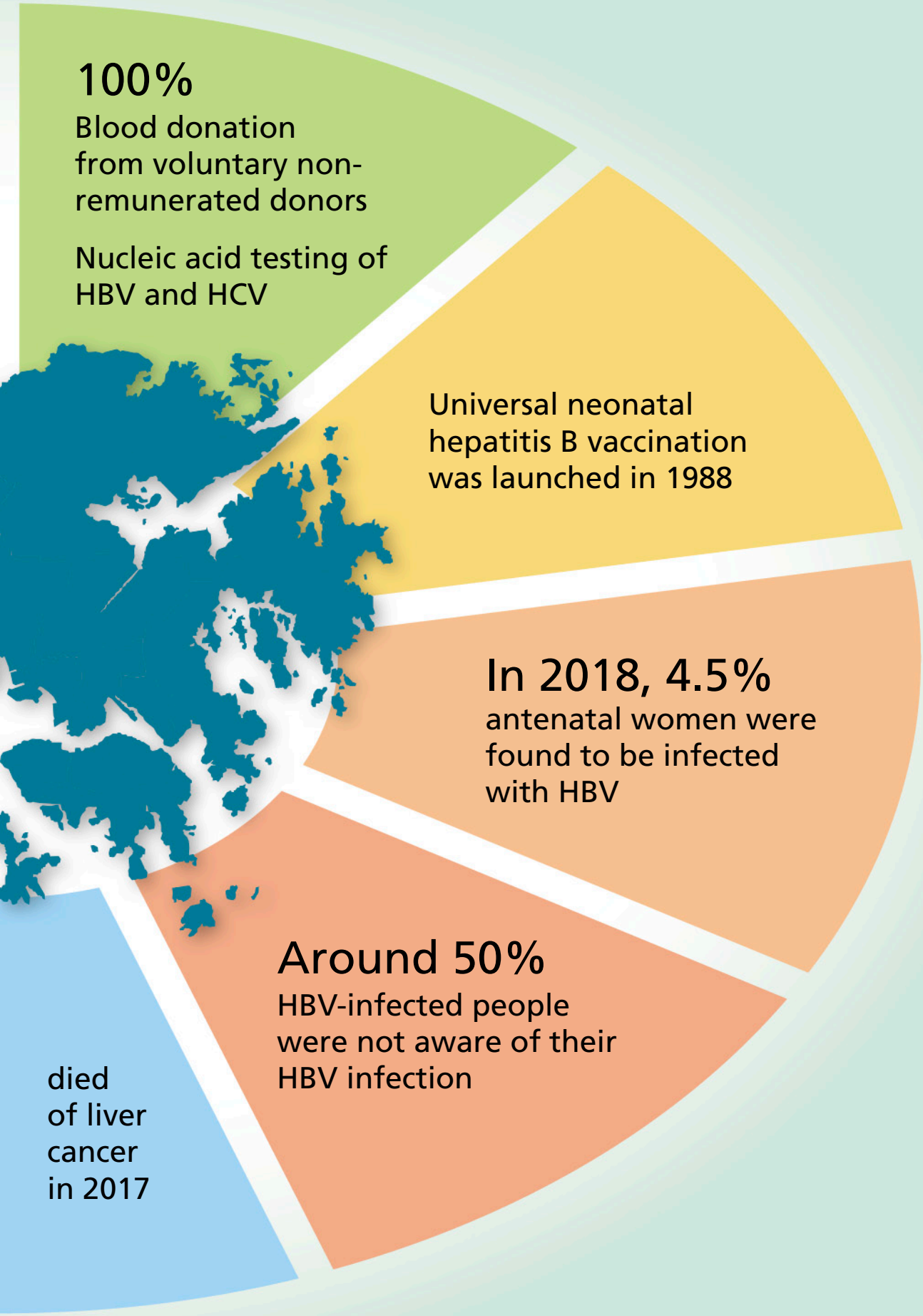
HCV infection

39. The access to HCV treatment remained limited globally and locally. In 2015, only 20% of persons living with HCV infection globally knew their diagnosis, of which 7% started on treatment. In Hong Kong, a modelling study gave a diagnosis rate at 22% and treatment coverage rate of those diagnosed at 6% [33].

40. The estimated prevalence of chronic HCV infection is 0.3%, which corresponds to approximately 22 000 persons infected with the virus. As reported in an epidemiological study using data retrieved from the Hong Kong HCV Registry, a total of 11 309 anti-HCV-positive patients were identified, giving an estimated territory-wide diagnosis rate at 51% [34]. The same study also gave a treatment coverage rate of around 12.4%.

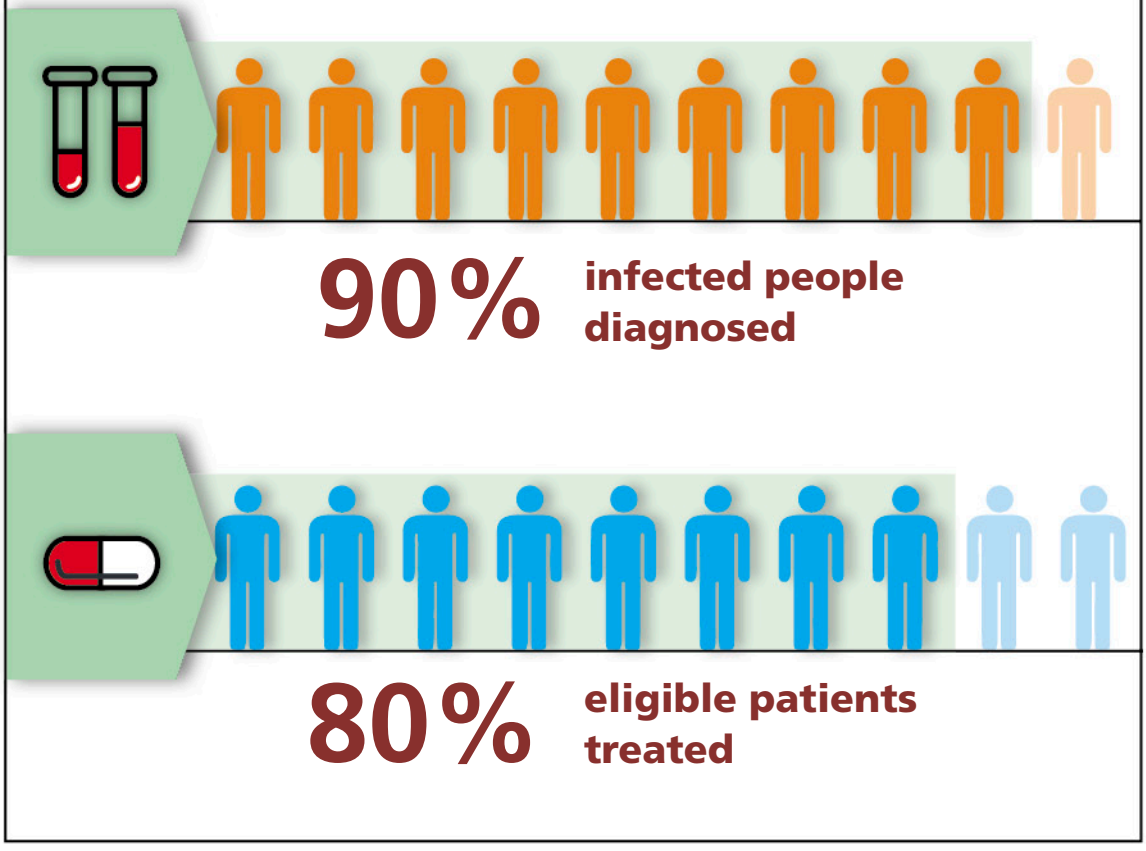
Hepatitis B & C in Hong Kong




100%
Blood donation from voluntary non-remunerated donors
Nucleic acid testing of HBV and HCV
Universal neonatal hepatitis B vaccination was launched in 1988
In 2018, 4.5%
antenatal women were found to be infected with HBV
Around 50%
HBV-infected people were not aware of their HBV infection
died of liver cancer in 2017

Box 1. WHO targets for diagnosis and treatment coverage

Much effort would be required to improve access to diagnosis and treatment for both HBV and HCV infection in Hong Kong, as the WHO targets for diagnosis and treatment rate in 2030 were set at 90% and 80% respectively.



Vision and Goals

41. To eliminate viral hepatitis as a public health threat to Hong Kong, this Action Plan has the following **Vision** and **Goals**:

Vision

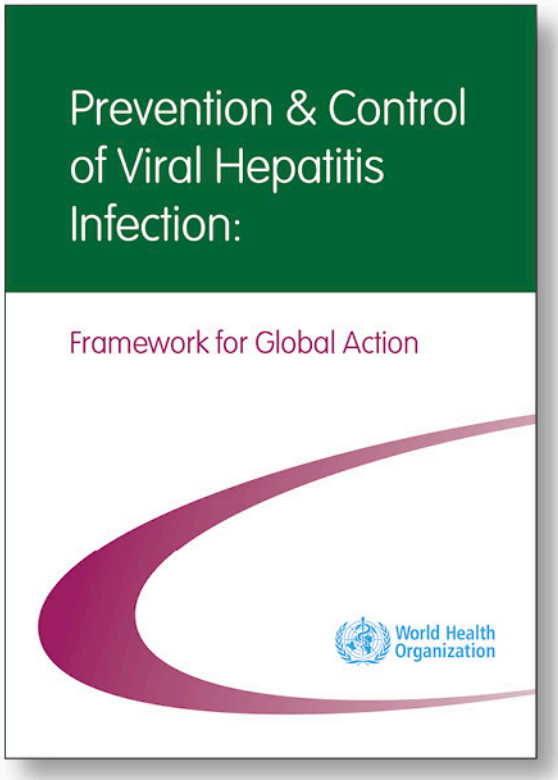
Hong Kong will be a place where new viral hepatitis infections have ceased, and where everyone with chronic viral hepatitis has access to effective and affordable care and treatment.

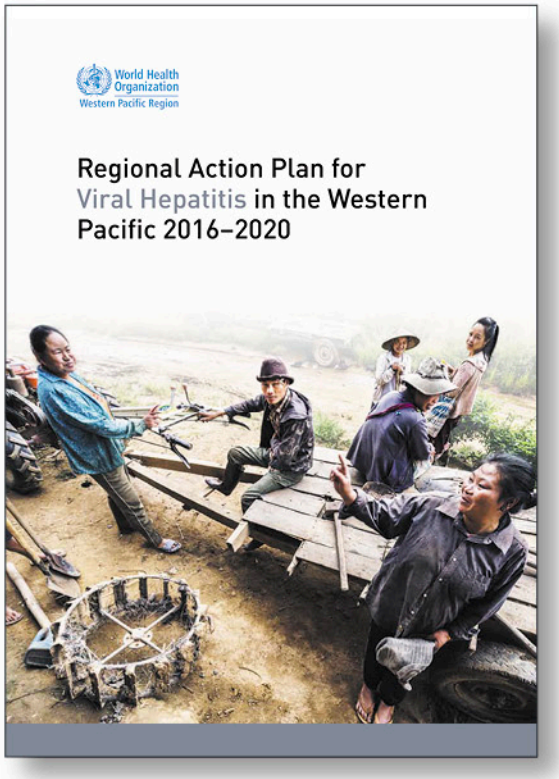
Goals

- Reduce transmission of viral hepatitis
- Reduce morbidity and mortality due to viral hepatitis

Strategies

42. The Global Hepatitis Programme published *Prevention and Control of Viral Hepatitis Infection: Framework for Global Action* in 2012 [35], and the Western Pacific Regional Office of WHO published the *Regional action plan for viral hepatitis in the Western Pacific 2016 - 2020* in 2015 [16]. Both documents define awareness, surveillance, prevention and treatment as the four axes of control strategies, and emphasise the importance of an action plan to galvanise society into focused and coordinated action.





43. This Action Plan adopts the four-axis framework of action of WHO: **awareness, surveillance, prevention** and **treatment**. Priority actions in each axis for achieving the WHO targets of viral hepatitis elimination have been developed.

44. Of note, the timelines for strategy actions are interdependent. For example, awareness campaigns to promote hepatitis testing hinge on the workforce required to manage the ensuing increased demand.

Strategy 1
Awareness

1. Launch awareness campaign for the general population
2. Provide professional training
3. Educate at-risk populations
4. Building supportive environment

45. In contrast to the endemicity of HBV in Hong Kong, public awareness is suboptimal. In 2010, a telephone survey of 506 respondents showed that 55% were aware that hepatitis B was the most common cause of chronic viral hepatitis, and 65% were aware that MTCT was a risk factor. Nevertheless, a majority (73%) erroneously believed that the virus was also transmittable by eating contaminated seafood [36].

Telephone survey: only 55% Hong Kong people were aware that HBV was the most common cause of viral hepatitis

46. Certain misconceptions of HCV are also widespread in the community. Most are unaware that HCV infection can be cured. Many view HCV as relatively benign and patient refusal was the most common reason (31.9%) for patients with HCV infection being left untreated [37]. In a more recent study, 16% of hepatitis C patients refused treatment even if offered [34]. This high level of treatment refusal may partly be attributed to the failure of understanding the seriousness of the disease and the effectiveness of treatment. Besides, some people associate HCV exclusively with injecting drug use and overlook the risk inherent with past exposure to blood and body fluids, MTCT and male-to-male sex. It is thus crucial that awareness and the correct knowledge of HCV are promoted to avoid stigmatisation on the one hand, and enhance acceptance of testing and subsequent linkage to treatment on the other.

Community engagement and awareness enhancement for HBV and HCV infections shall be tailored to the needs of different target groups, such as the general public, healthcare workers, at-risk populations, patients and their service providers.

A supportive environment is needed to address the consequential service need following increasing awareness.

Strategy 1.1: Awareness campaign for the general population

47. Promotion of public awareness, to improve knowledge and awareness of viral hepatitis and to reduce stigma and discrimination associated with the infection in the general population, is essential to prevention and treatment efforts as well as societal support to policy. Promotion activities in the awareness campaign tailored to the general local situation and context should be conducted. Simple and targeted health messages are preferred.

48. Viral Hepatitis Control Office, Department of Health, has been providing health education through various channels, including telephone hotline, internet, printed materials and health talks for the public, etc.

Actions

1.1.1 Viral Hepatitis Control Office (VHCO) has its own website www.hepatitis.gov.hk for disseminating various information for the public. The website has been revamped in early 2020 to provide essential and updated information on viral hepatitis, meeting the public's need and improving user experience.

1.1.2 Further enhancement to the website to strengthen the design and functionality will be made as required.

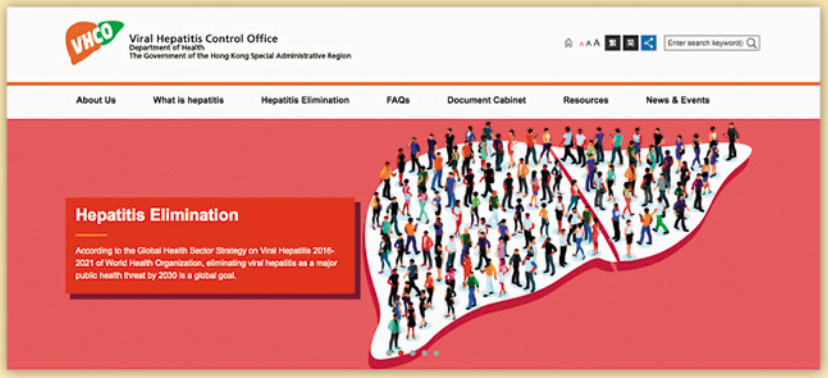


Figure 7. Website of VHCO

1.1.3 **World Hepatitis Day** is a key event to recognise, promote and raise awareness of hepatitis around the world. It falls on 28 July each year. To echo World Hepatitis Day each year, roving exhibitions on viral hepatitis are held to promote public awareness of the prevention of viral hepatitis. Yearly themes of awareness campaign for the coming three years are listed in Table 5.

Table 5. Yearly themes of awareness campaign

Year	Theme
2020	Chronic HBV and HCV infections are asymptomatic but can cause liver cancer
2021	Prevention of vertical transmission of HBV – use of hepatitis B immunoglobulin (HBIG) and vaccine, and use of antivirals during pregnancy
2022	HBV – get tested and treated

1.1.4 The yearly theme of 2023 - 2024 will be decided according to the public's need in the fourth quarter of 2022.

1.1.5 The next stage of awareness campaign, including billboards at bus stops and involvement of Kwai Tsing District Health Centre (DHC), would be launched.

Strategy 1.2: Professional training for healthcare workers

49. Professional training is to promote evidence-based diagnosis and treatment of HBV and HCV infection so as to expand capacity and skills in the hepatitis workforce. The training will improve the quality and consistency of health care delivery, focusing on practical knowledge required in managing HBV and HCV infection.

Knowledge-attitude-practice assessment

50. Evidence indicates that education programmes, whether for professionals or patients, that are based on well-conducted assessments can lead to changes in behaviour [38]. A knowledge-attitude-practice (KAP) assessment is to collect information on the knowledge (i.e. what is known), attitudes (i.e. what is thought), and practices (i.e. what is done) about a specific topic. KAP assessment should be undertaken for the development of professional training materials for healthcare workers' long-term use.

Target audience

51. Different medical specialties are involved in the care continuum of hepatitis. To meet the specific needs of healthcare workers of different specialties, tailored training materials should be developed for different specialties to ensure that patients receive access to appropriate care at key points in their care pathway.

52. Professional training should follow service need and support the implementation of prioritised and policy-driven initiatives. For example, as the use of antivirals for pregnant women with high HBV viral load will be implemented in 2020 - 2021, KAP assessment will be conducted for obstetricians and midwives who are involved in the initiative.

53. KAP assessment will then be conducted for doctors of other specialties, such as (i) medical physicians who are not hepatologists, gastroenterologists or infectious disease physicians, (ii) family physicians and general practitioners, and (iii) other doctors, such as oncologists and surgeons, according to their service need.

54. Appropriate professional development programmes will be developed accordingly to enhance their capability of managing HBV and HCV infections. Professional training materials should also be developed for other groups of healthcare workers.

Actions

1.2.1 To improve the capacity and capability to deliver quality care to patients with chronic HBV and HCV infection, professional training programmes with the KAP assessment will be conducted incrementally. The plan is to start with obstetricians and midwives who are going to support new initiatives in prevention of MTCT of HBV (details under "Prevention" section). Thereafter, training materials will be developed for other groups of healthcare workers under the similar framework by phases.

Strategy 1.3: Education targeting at-risk populations, patients and their service providers

55. Counselling and education provided to at-risk populations aim to induce behavioural changes to lower their health risk from contracting HBV or HCV, such as practising safer sex and quitting drug injection practices. Patients and at-risk populations need to know about the transmission route of HBV and HCV and benefits of treatment for HBV and HCV, which can prevent the adverse consequences of chronic HBV and HCV infection, like cirrhosis and liver cancer.

Actions

Education targeting at-risk population, patients and their service providers would be given as follows.

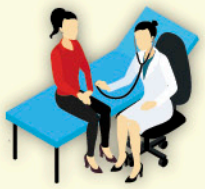
1.3.1 Focused education materials on preventive strategies of perinatal HBV transmission will be made available. Specific information on use of antiviral therapy to reduce the risk of transmitting HBV to babies will also be made available to pregnant women with chronic HBV infection of high viral load.

1.3.2 Preventing transmission of HBV and HCV by safe injection and safer sex practices should be emphasised. The work can be integrated with HIV prevention programme. For example, distribution of free condoms to promote "safer sex" can be coupled with education about the transmission of HIV and also HBV and HCV.

1.3.3 Service providers for at-risk populations, such as PWID, shall be targeted. Information on the implications of HCV infection, benefits of and access to HCV testing and treatment services should be provided to PWID. Standardised training and education materials on HCV infection should also be made available to service providers of PWID.

Strategy 1.4: Building a supportive environment

56. To eliminate HBV and HCV infection, infected persons must be identified and managed to reduce the risk of chronic infection and further transmission of the virus. A supportive environment would pave the way for effective identification and management of HBV and HCV infection.



Actions

1.4.1 Provision of quality testing and treatment is crucial to the successful control of HBV and HCV infection. The service capacities of testing and treatment should be scaled up to match the clinical need.

1.4.2 An evaluation of HBV- and HCV-related service in the public sector, including diagnosis, linkage to care, treatment, follow-up and related support services has to be undertaken to provide useful information to support the longer term planning and capacity building for managing HBV and HCV infection in Hong Kong.

Strategy 2
Surveillance

1. Conduct ongoing surveillance
2. Develop local indicators

57. The purposes of conducting surveillance for viral hepatitis are threefold [39]:

- To detect outbreaks, monitor disease trends and identify risk factors for new incident infections
- To estimate the prevalence of chronic infections and monitor trends in the general population or in highly affected groups
- To estimate the burden of sequelae due to chronic hepatitis, including cirrhosis and HCC

58. The ultimate goal of conducting surveillance for viral hepatitis is to direct and evaluate interventions to prevent, control and treat viral hepatitis.

59. As described in the local situation in the Introduction, surveillance of viral hepatitis has been conducted through different mechanisms. The notification system is in place for acute viral hepatitis surveillance, while seroprevalence data in different communities are regularly reported to DH for assessing the burden of chronic HBV and HCV infection.

60. The present surveillance system carries some limitations. Firstly, substantial under-reporting cannot be ruled out, due to the asymptomatic nature of infection. Secondly, the seroprevalence data collected by DH are limited to specific subgroups, such that generalisation of the results to the entire population should be made with caution. Thirdly, surveillance efforts for viral hepatitis have evolved from relying on clinicians' report of patients with illnesses compatible with acute hepatitis to increasingly common laboratory-based reporting of serologic markers for viral hepatitis. Besides increasing the completeness and timeliness of case identification, laboratory-based reporting also identifies asymptomatic individuals with newly acquired infections, individuals with chronic infection, and individuals for whom there is insufficient information to verify the diagnosis based on laboratory testing alone. As such, the number of asymptomatic persons identified can be highly variable depending on testing practices, resulting in artificial variation in incidence temporarily [40].

To achieve the WHO 2030 targets, additional information is required to support the evidence-based policy-making for prevention and control of HBV and HCV infection, as well as close monitoring of the progress towards these goals in Hong Kong.

A consistent approach should be adopted for the measurement of the Local Indicators regularly. As such, comparability of the indicators over time can be ensured for monitoring the progress towards the 2030 WHO targets.

Actions

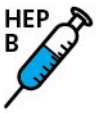
2.1 The current surveillance on viral hepatitis, including the notification system for acute infection, assessment for chronic infection and evaluation of hepatitis B vaccination coverage, will be continued.

2.2 To enhance the current surveillance system of viral hepatitis, a set of **twelve local indicators**, based on the core indicators for assessing the corresponding health sector response suggested by the WHO, are adopted after considering their usefulness, applicability and relevance in the local setting (Table 6).

2.3 The next **Population Health Survey (PHS)**, a territory-wide survey with two components, namely household questionnaire survey and health examination, will be conducted by DH in 2020 - 21. It covers the land-based non-institutional population aged 15 or above for household questionnaire survey and a subsample of respondents aged between 15 and 84 for health examination. It will provide a representative and detailed analysis of the latest prevalence of chronic HBV and HCV infection in the general population (Local Indicators 1, 2), as well as the proportion of patients with chronic HBV and HCV infection who have been diagnosed (Local Indicator 5). For Local Indicators 6 - 9, clinical data from HA will be the main data source as the majority of local population is receiving outpatient and inpatient services for viral hepatitis in HA. The well-established information system in HA also allows continuous and systematic collection of related clinical data.

2.4 A consistent and sustainable approach would be adopted for the measurement of the Local Indicators regularly for 2015, 2020, 2025 and 2030.

Table 6. List of local indicators developed for monitoring and evaluation of viral hepatitis elimination strategies

Local Indicator		Description of the Indicator
1		Prevalence of chronic HBV infection
2		Prevalence of chronic HCV infection
3		Coverage of timely hepatitis B vaccine birth dose (within 24 hours) and other interventions to prevent MTCT of HBV
4		Coverage of third dose of hepatitis B vaccine among infants
5		People living with HCV and/or HBV diagnosed
6		Treatment coverage for hepatitis B patients
7		Treatment initiation for hepatitis C patients
8		Viral suppression for chronic hepatitis B patients treated
9		Cure for chronic hepatitis C patients treated
10		Cumulated incidence of HBV infection in children 5 years of age
11		Incidence of HCV infection
12		Deaths attributable to HBV and HCV infection

* Definition, corresponding WHO targets, data collection methods and provisional figures, where available, are provided in Annex I

Strategy 3
Prevention

1. Universal screening for pregnant women and neonatal vaccination for hepatitis B
2. Use antivirals for preventing MTCT of HBV
3. Post-vaccination serologic testing
4. Prevent healthcare-related transmission of HBV and HCV
5. Reduce the risk and disease burden in vulnerable populations

Mother-to-child transmission (MTCT) is an epidemiologically important route of HBV transmission, which accounts for the prevalence of HBV infection in Hong Kong. Preventing MTCT by vaccination and other available means should be the focus.

There is no vaccine for hepatitis C. Its prevention measures should be on controlling the practices known to spread it and curing chronic infection.

Strategy 3.1: Reduce mother-to-child transmission (MTCT) of HBV

61. WHO has set a clear target of achieving 0.1% HBsAg prevalence or less among the 5 year olds by 2030 as surrogate of a 90% reduction in incidence of chronic HBV infection.

62. In Hong Kong, universal screening of pregnant women for HBsAg during each pregnancy and universal neonatal hepatitis B vaccination, launched in 1988, are key priorities. In addition, hepatitis B immunoglobulin (HBIG) has also been administered for babies born to HBsAg-positive mothers, providing immediate and short-term protection against HBV infection. The focus has mainly been on protecting the babies by ensuring the completion of the vaccination series and at-birth prophylaxis. Action is also needed to ensure the HBV-infected women are referred to appropriate care and treatment.

63. Universal screening of pregnant women for HBsAg during each pregnancy and universal neonatal vaccination must be continued to be an integral part of the MTCT prevention programme, and its coverage is regularly monitored and evaluated by the Immunisation Coverage Survey (Local Indicator 4).

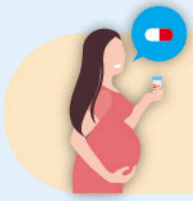
Strategy 3.1.1
Using antivirals to prevent MTCT of HBV

64. It is vital to acknowledge that the current measures, including universal screening of all pregnant women, at-birth prophylaxis with HBIG, as well as hepatitis B vaccination for newborns of infected mothers, are unable to prevent all MTCT of HBV infection.

Box 2. Findings from a local study about MTCT of HBV [41]

- MTCT continued to occur at a rate of 1.1% (7 out of 641 HBsAg-positive mothers), despite the use of hepatitis B vaccines and HBIG.
- Babies born to women with high levels of viraemia were particularly vulnerable.

HBV DNA level at 28 – 30 gestation weeks	Proportion of HBsAg-positive pregnant women	Risk of immunoprophylaxis failure
> 7 $\log_{10}$ copies/mL (about 2 X 10^6 IU/mL)	22.3%	4.9%
> 8 $\log_{10}$ copies/mL (about 2 X 10^7 IU/mL)	18.9%	5.8%



Effective antivirals which can further reduce the risk of MTCT of HBV are available.

65. At present, there are effective antivirals which can further reduce the risk of MTCT of HBV. International studies have confirmed the success of the use of antivirals for pregnant women with high HBV DNA to further prevent MTCT [42,43]. As of now, WHO has recommended her Member States to evaluate its use [44], while many developed countries have already endorsed it as standard medical practice [45,46].

66. To eliminate MTCT of HBV in Hong Kong, use of antivirals for HBsAg-positive pregnant women with high viral load should be adopted to fill the missing link in the elimination of MTCT.

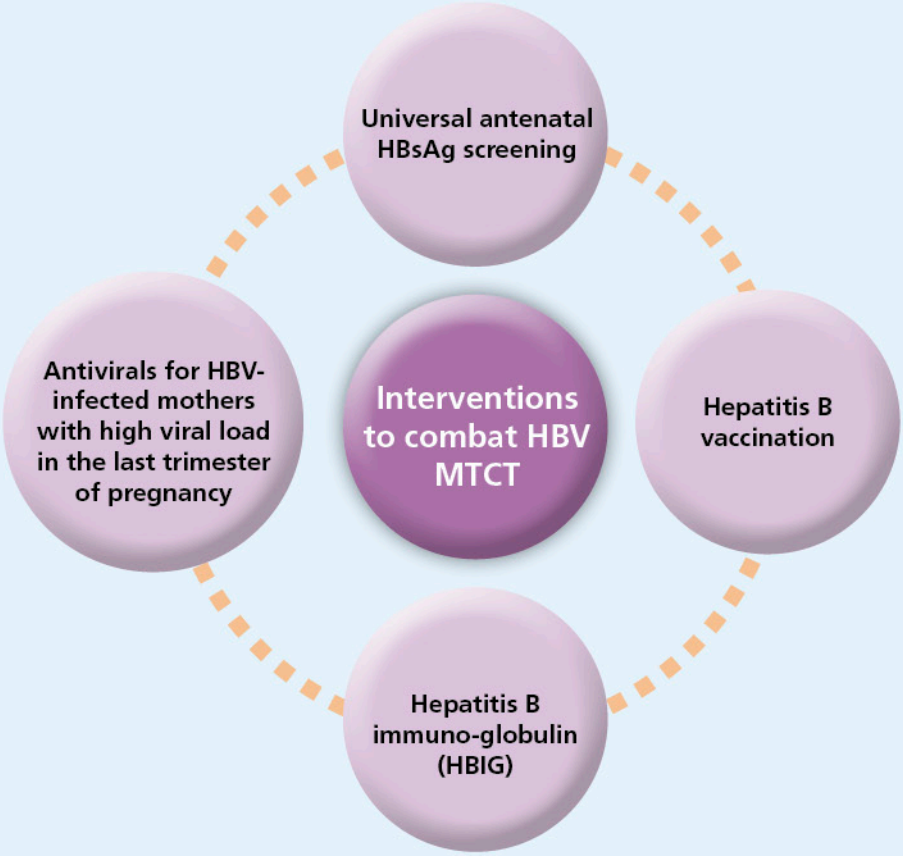


Figure 8. Interventions to combat MTCT of HBV

67. Based on about 5% seroprevalence of HBsAg among pregnant women in 2016 - 2018 and the annual number of births of around 60 000 in Hong Kong for preliminary projection, an estimate of 3 000 pregnant women will have to be tested for potential need of antiviral prophylaxis per year. This number is anticipated to fall with time, while seroprevalence of antenatal mothers decreases.

68. Of note, logistic challenges will be many, in that early identification of high-risk mothers would be crucial to allow timely initiation of antiviral treatment. Safeguards against hepatitis flare also need to be put in place if the mother discontinues treatment after delivery.

Actions

3.1.1.1 A policy initiative to provide HBsAg-positive mothers with high viral load with a treatment option to use antivirals should be established.

3.1.1.2 HBsAg-positive pregnant women with high viral load should be provided with a treatment option to use antivirals. The HBV viral load cut off for providing antivirals to pregnant women is at >200 000 IU/mL and the number of target patients is estimated to be around 800 per year. These mothers will continue to receive long-term management of their liver condition after giving birth. For HBsAg-positive pregnant women with a viral load ≤ 200 000 IU/mL, they would be referred to doctors conversant with HBV treatment for routine assessment and management of the liver condition.

3.1.1.3 Its implementation would be supported by addressing the service gaps in drug, laboratory and manpower: widening the indications in HA Drug Formulary for the appropriate antivirals, covering this target patient group, building laboratory capacity and establishing nurse clinic to augment the capacity and alleviate pressure of hepatology clinics and antenatal clinics. At the beginning of 2020, Prince of Wales Hospital (PWH) and Queen Mary Hospital (QMH) piloted the service.

3.1.1.4 The service will then be rolled out to eight more hospitals in HA, including the remaining six birthing hospitals in 2020/21.

3.1.1.5 Professional training to specialists in obstetrics and gynaecology (O&G), public and private sectors, on the use of antivirals in prevention of HBV MTCT using the platform of the Hong Kong College of Obstetricians and Gynaecologists should be explored.

3.1.1.6 The acceptance of using antivirals to prevent MTCT will be reviewed.

Strategy 3.1.2
Post-vaccination serologic testing for babies born to HBsAg-positive mothers

69. While the current strategy of hepatitis B vaccination coupled with HBIG administration for HBV-exposed newborns is highly effective in preventing the development of the carrier state in babies born to HBsAg-positive mothers, there are still 5 - 10% of high-risk babies who may not be protected [47].

70. To further minimise and eventually eliminate perinatal HBV transmission completely, further strengthening of the current programme is required. WHO and the Western Pacific Region emphasise that post-vaccination serologic testing (PVST) of babies born to HBsAg-positive mothers is important to determine effectiveness of prevention of MTCT of HBV when antenatal HBV screening is in place [48].

Post-vaccination serologic testing (PVST)

71. The purposes of PVST:

- To identify babies born to HBV-infected women who do not have an adequate immune response to an initial hepatitis B vaccine series and thus require revaccination
- To enable early identification of HBV-infected babies to ensure appropriate medical care for them
- To provide useful systemic information to monitor the programme and overall prevention strategy

72. PVST consists of testing on HBsAg and anti-HBs of all babies born to HBV-infected women at the age of 9 - 12 months (or 1 - 2 months after the final dose of the vaccine series, if the series is delayed) [49]:

- HBsAg test: to exclude or to confirm HBV infection
- Anti-HBs test: to check immunity against HBV infection

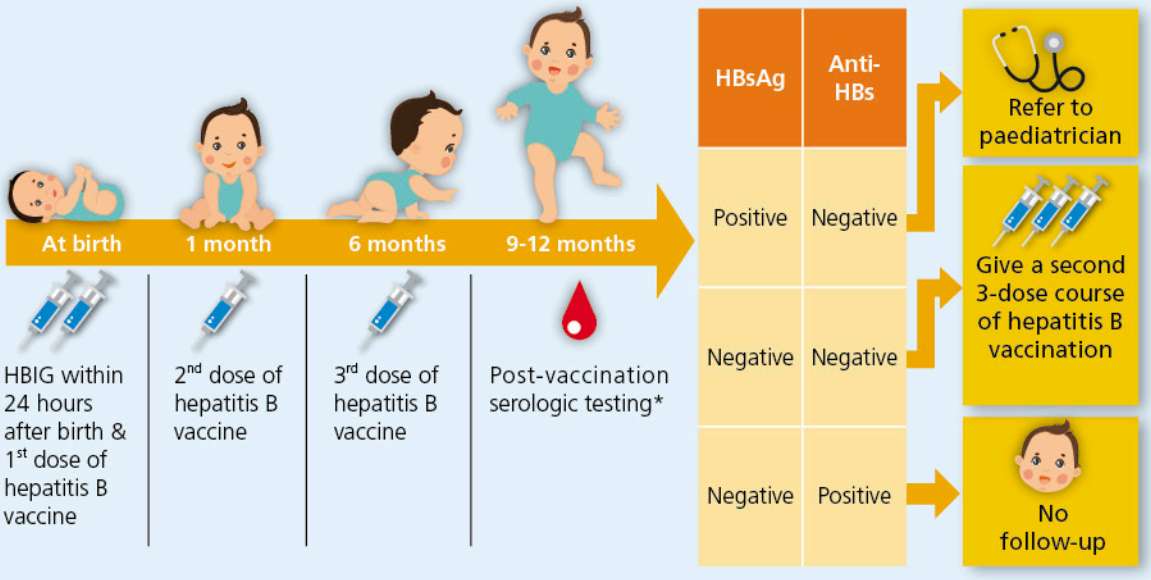
73. Appropriate action will be taken based on the results of PVST (Table 7).

Table 7. Interpretation of PVST results and the corresponding actions

Blood result		Interpretation	Follow-up
HBsAg	Anti-HBs*		
Negative (–)	Positive (+)	Vaccine responders and seroprotected	Not required
Negative (–)	Negative (–)	Vaccine non-responders	Give a second 3-dose series of hepatitis B vaccines, followed by re-testing for HBsAg and anti-HBs 1 - 2 months after the final dose**
Positive (+)	Negative (–)	Hepatitis B infection	Refer to paediatricians for appropriate medical follow-up

* A negative test result refers to an anti-HBs level < 10 mIU/mL and a positive test refers to an anti-HBs level ≥10 mIU/mL;

** In general, persons who do not respond to an initial 3-dose vaccine series have a 30 - 50% chance of responding to a second 3-dose series.



* Testing should not be performed before the age of 9 months to avoid detection of passive anti-HBs from HBIG administered at birth. In case of defaulted scheduled PVST appointment, PVST can be offered to babies up to the age of 24 months, to be in line with many PVST studies.

Figure 9. Flowchart of post-vaccination serologic testing

Actions

- 3.1.2.1 A policy initiative to provide post-vaccination serologic testing to babies born to HBsAg-positive mother should be established.
- 3.1.2.2 The implementation plan and the associated resources implication has to be established.
- 3.1.2.3 Professional training on PVST to obstetricians and paediatricians would be provided.
- 3.1.2.4 The logistics and workflow of PVST would be established.
- 3.1.2.5 PVST would be conducted for babies born to HBsAg-positive mothers.
- 3.1.2.6 The acceptance of PVST programme would be reviewed.

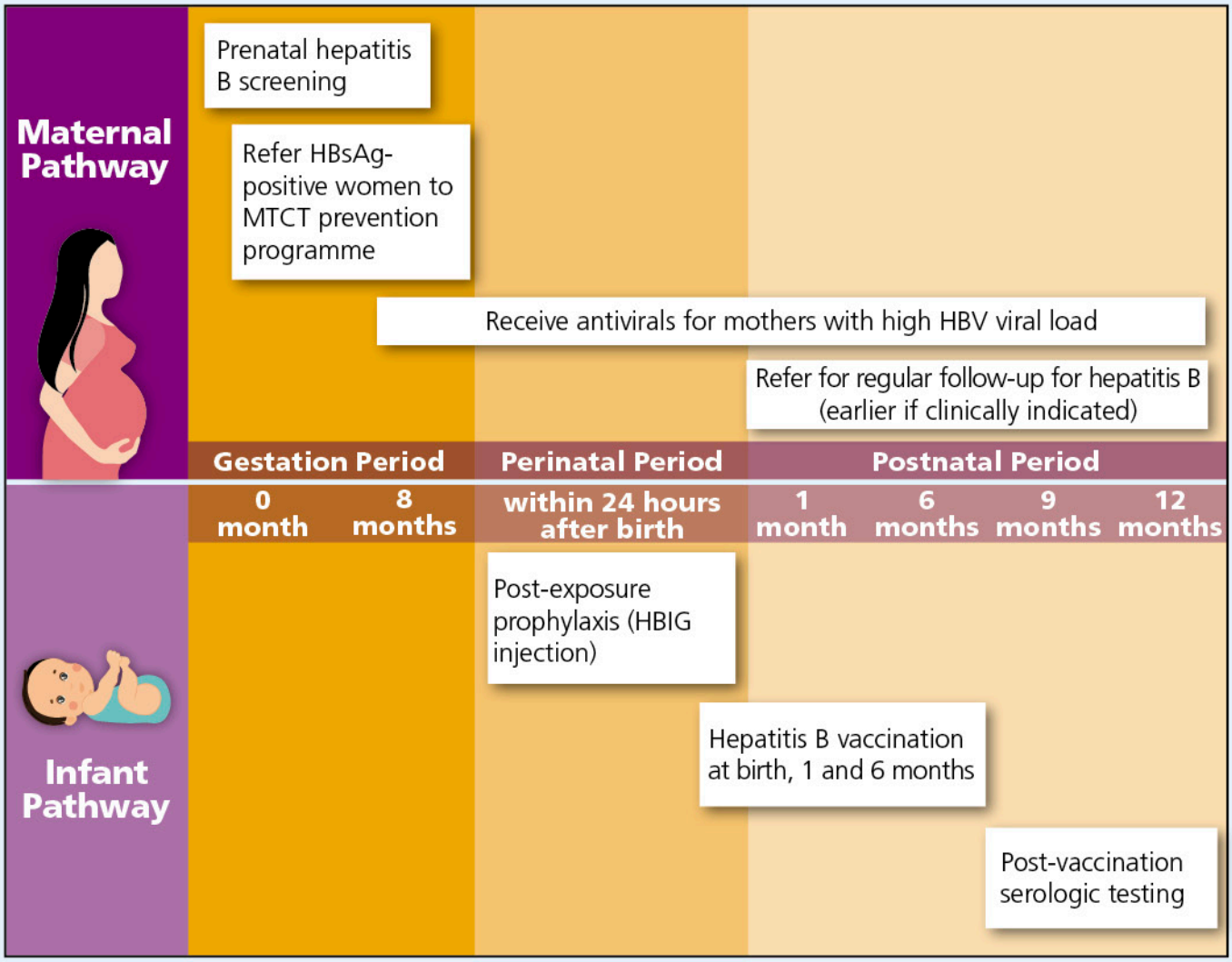


Figure 10. Hepatitis B MTCT prevention pathways with the use of antivirals and PVST

Strategy 3.2: Prevent healthcare-related transmission of HBV and HCV

74. Globally, transmission of HBV and HCV occurs in healthcare settings primarily due to failure of ensuring safe blood supply or upholding infection control standards. Many recommendations by WHO, such as a centralised transfusion service and other infection control procedures, are already in place in Hong Kong.

75. In Hong Kong, blood safety strategies are based on 100% voluntary non-remunerated blood donations, donor selection, and quality-assured screening by antibody and nucleic acid testing of all donated blood and blood components used for transfusion. These strategies can prevent transmission of HBV and HCV effectively. Since 1978, screening of blood donors for HBsAg has been in place to prevent transfusion-transmitted HBV infection. Nevertheless, transfusion of contaminated blood and blood products was a significant mode of transmission of HCV before the institution of blood donor screening for HCV in 1991.

76. Various local infection control guidelines have clearly and consistently recommended prevention of nosocomial transmission of blood-borne viruses by Standard Precautions, hepatitis B vaccination and documentation of post-vaccination serology for healthcare workers, as well as management of occupational exposure, including medical evaluation for testing, treatment and use of post-exposure prophylaxis as appropriate [50,51,52,53,54]. These widely adopted infection control measures in the local healthcare settings have substantially reduced healthcare-related transmission of HBV and HCV.

Actions

3.2.1 The current blood safety strategies should be continued and new developments to be monitored and reviewed.

3.2.2 A systemic look back exercise was undertaken in 1990s to ensure patients potentially infected with HCV through contaminated blood or blood products were traced, investigated and managed. Clinically indicated treatment will be continuously provided to people contracted HCV through blood or blood product transfusion.

3.2.3 Infection control training on Standard Precautions, such as aseptic technique, proper sharps handling and management of needlestick injury or mucosal contact, is being provided to healthcare workers on a regular basis, with an aim to reduce their chance of acquiring or passing on infections of bloodborne viruses, including HBV and HCV, through occupational exposure.

Strategy 3.3: Reduce risk and disease burden in vulnerable populations

77. People who inject drugs (PWID) and HIV-positive MSM constitute key populations for intervention, as they are not only disproportionately burdened with HCV infection, but also carrying transmission risks to others through risk practices [55].

78. The development of DAA offers a cure of HCV infection. The strategy of "Treatment as Prevention" by targeting effective DAA treatment to vulnerable population groups, such as PWID and HIV-positive MSM, is discussed in the "Treatment" section. Notably, the network of methadone clinics affords the opportunity to engage PWID.

Actions

3.3.1 Given the emergence of sexually acquired HCV infection in HIV-positive MSM, condom programming has to be intensified and harm reduction approach should be taken, especially those having chemsex. Moreover, the possibility that sexually acquired HCV crosses to HIV-negative MSM should also be scrutinised.

Strategy 4
Treatment

1. Enhancement of treatment for hepatitis B
2. Expansion of access to direct-acting antivirals for HCV
3. Micro-elimination of HCV infection
4. Promotion of HCV testing in people who inject drugs

Current available treatments can control chronic HBV infection effectively through inhibiting viral replication and cure chronic HCV infection, resulting in substantial reduction in HBV- or HCV-related morbidity and mortality.

To reduce hepatitis-related mortality, providing effective treatment for people infected with HBV and/or HCV is crucial.

Strategy 4.1: Enhancement of treatment for HBV infection

79. The WHO has set out targets on eliminating viral hepatitis by 2030, which calls for 90% diagnosis rate and 80% treatment rate respectively.

80. Although Hong Kong has implemented universal neonatal vaccination in 1988, the time between initial infection and onset of complications, like cirrhosis and liver cancer, usually takes decades. This implies that the burden of disease attributable to HBV infection will remain high in Hong Kong for several decades. Currently, the estimated prevalence of HBV infection is 7.2%, which amounts to around 540 000 hepatitis B patients.

81. Essentially all patients with chronic HBV infection require long-term medical care:

- Antiviral treatment should be initiated in patients who are at high risk of HBV-related morbidity, and who are likely to benefit from treatment.
- Patients who are not immediately eligible for treatment should be monitored and started on antiviral therapy when indicated.
- As chronic HBV infection contributes significantly to the development of liver cancer (hepatocellular carcinoma [HCC]), many expert guidelines recommend regular HCC surveillance, which usually comprises of liver ultrasonography and measurement of serum alpha-fetoprotein (AFP), in at-risk individuals [56].

82. To meet the WHO targets, both diagnosis and treatment capacity for HBV infection should be built up in order to meet the substantial demand.

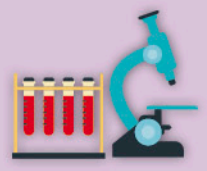
83. Given the limited healthcare resources and competing needs arising from the aging population, short- and long-term plans are needed to augment and optimise the management capacity for HBV infection in the public and private sector.

84. Primary care providers should be involved in the diagnosis and management of hepatitis B patients in the community setting. Therefore, shared management based on close collaboration among general practitioners, family physicians and hepatologists, through the identification of their respective tasks, needs to be explored for better diagnostic and therapeutic management of the patients.

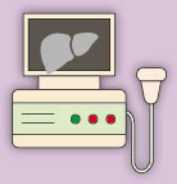
Actions

4.1.1 To augment the diagnosis and treatment capacity for HBV infection, enhancements in HA in four areas, including laboratory, equipment, drug and model of care, will be required.

- Laboratory capacity will be built up to dovetail with the implementation of initiative for preventing MTCT of HBV in HA hospitals.



- The equipment for transient elastography measured by ultrasound-based device for assessing severity of fibrosis in viral hepatitis will be scaled up. HA plans to procure one device for each hepatitis clinic, which is either in lack of such equipment or in need of replacement.



- To enhance the service on preventing MTCT of HBV, the initiative for providing antivirals to HBV-infected pregnant women with high viral load will be implemented: the indications for the appropriate antivirals in HA Drug Formulary were widened starting from January 2020, coupled with additional drug funding to be injected in 2020 - 21.

- The nurse clinic model is adopted as a measure to augment the capacity of liver clinic. The hepatitis nurse would assist hepatologists in assessing and managing stable hepatitis patients according to the established protocol. The nurse would also help in performing transient elastography measurement and counselling patients, especially for pregnant women receiving antiviral treatment. The nurse clinics are being set up in QMH and PWH in 2020 as a pilot programme and will be implemented in other hospitals in the coming years.

4.1.2 Periodic review will be conducted to assess if scaling up of the programme is necessary to cope with the increasing demand for diagnosis and treatment of patients with viral hepatitis.

To sustain and to expand the service provision on hepatitis management, it is crucial to explore strategies to enhance management capacity for HBV infection, by both public and private sectors, in the long run.

4.1.3 Hepatologists should be engaged to explore strategies to enhance service capacity for HBV infection in both public and private settings.

4.1.4 Primary care physicians should also be engaged to support management of HBV infection at primary care setting.

4.1.5 Guidance on practice and referral mechanism to support management of HBV infection at primary care setting should be developed.

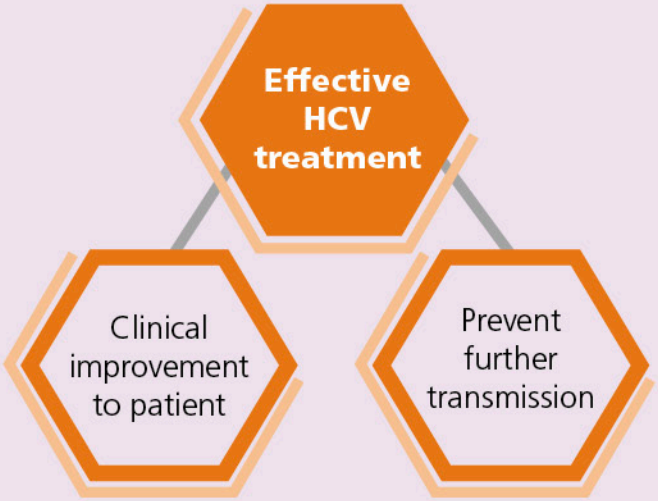
4.1.6 The developed guidance on practice and referral mechanism will then be promulgated in order to optimise the capacity in caring patients with hepatitis B in the community setting.

4.1.7 As part of the clinical management of HBV infection, the service need of ultrasound for HCC surveillance would be estimated.

85. While focusing on making recommendations that could be implemented with existing knowledge and available means to improve treatment capacity of HBV infection, it is agreed that exploration and deliberation on feasible approaches to draw on the capacity and resources of the private health sector to test and treat HBV infection is required. This may include exploring potential healthcare delivery models to reduce financial barriers to the general population to access care in the private sector, defining the role of the public and private services and establishing the level of care needed to manage hepatitis B patients of different disease stages, etc.

Strategy 4.2: Expansion of access to direct-acting antivirals for HCV

86. Curing chronic HCV infection has immense clinical benefit [57]. Cured patients, even those already with cirrhosis, may experience a reversal of hepatic fibrosis over time [58,59]. Reduction in fibrosis and return to normal liver function are associated with a decreased risk of hepatic decompensation, HCC and all-cause mortality [60,61]. Furthermore, curing chronic HCV infection can also help eliminate HCV transmission [62,63].



87. Simple yet effective options of DAA are now available for all genotypes, and for treatment-experienced as well as naïve [5]. The cure rates are typically in excess of 90%.

88. Albeit with high cure rates, DAA does not confer immunity against future HCV infection. Reinfection can occur if risk behaviour persists.

HCV treatment indication

89. Currently, WHO recommends treatment to all individuals diagnosed with HCV infection who are aged 12 or above, irrespective of disease stage [5]. In children aged less than 12 with chronic HCV infection, WHO recommends deferring treatment until 12 years of age.

Local situation

90. Prior to 2019, only patients with advanced fibrosis or cirrhosis who were contraindicated or intolerant to conventional interferon-based therapy are eligible for subsidised DAA treatment in HA.

91. Treatment of HCV is not only constrained by the provision of DAA, but also the equipment and laboratory facilities for diagnosis and management of the infection. Enhancing the capacity for these factors is also required to treat and manage HCV infection.

Actions

4.2.1 DAA should be the integral part of the HCV treatment. The use of DAA will be extended to milder stages of disease as indicated by the degree of liver fibrosis and eventually to all patients with HCV infection. Thus, a policy initiative to deploy DAA in HCV treatment in a stepwise manner should be established.

4.2.2 HA Drug Formulary indication for DAA treatment is expanded from advanced fibrosis (F3 and F4 on transient elastography) to F2 in the second quarter of 2019 to increase treatment capacity of HCV.

4.2.3 Further expansion of DAA aiming to treat all patients diagnosed with HCV infection regardless of their disease severity (i.e. degree of fibrosis) will be implemented in 2021.

4.2.4 The number of patients treated with DAA will be reviewed.

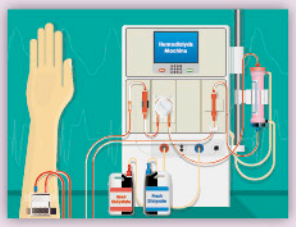
Strategy 4.3: Micro-elimination of HCV infection

92. Micro-elimination is targeted elimination of HCV infection in well-defined populations. It is a strategy to achieve elimination incrementally through initiatives that eliminate hepatitis C for defined segments of the population, such as within settings, geographic areas, subpopulations and age cohorts [64]. Targeting smaller and clearly delineated HCV risk groups allows for faster and more efficient delivery of interventions [65]. The selection of targeted groups for micro-elimination initiatives should be based on the burden of hepatitis C.

Local situation

93. The prevalence of HCV infection in people on renal dialysis and HIV-positive people is significantly higher than that in the general population. HCV screening is being conducted in these populations.

Strategy 4.3.1
Screen and treat patients with end stage renal failure on dialysis



94. HCV infection is implicated in adverse hepatic outcomes in patients undergoing dialysis [66]. In addition, accumulating evidence has shown that chronic HCV infection can have serious consequences for different organs and systems other than the liver. The extrahepatic manifestation of chronic HCV infection can explain the relationship between HCV infection and decline in kidney function in patients with chronic kidney disease [67].

95. Transmission of HCV infection and even outbreaks has been reported in dialysis unit. Transmission of HCV in haemodialysis unit has been reported to be associated with procedures with blood exposure, where contamination can involve the dialyser, connection tubing, needles and even via blood spillage to the surroundings [68].

96. Prevention of transmission of HCV in haemodialysis patients has improved over the years due to better screening of blood products, improved dialysis procedures, and lesser demand for blood transfusion with the availability of erythropoiesis-stimulating agents. However, HCV prevalence remains far higher in people receiving haemodialysis than in the general population [69]. In Hong Kong, the prevalence of HCV in patients receiving dialysis is 1 - 2%, while that in the general population is reported to be 0.3% [19].

97. Treating HCV infection in patients on dialysis would achieve **"treatment as prevention"** outcome of reducing the incidence of transmission in dialysis units when coupled with appropriate infection control measures. It would also reduce the risk of HCV exposure to healthcare workers caring for this group of patients.

Haemodialysis recipients in Hospital Authority

98. As part of infection control measures, rigorous HCV screening is being conducted in this population. Some of the haemodialysis patients, who are tested positive to anti-HCV, may have already received DAA treatment if they are on renal transplant waiting list or they have significant liver fibrosis. While strict adherence to infection control measures remains the most important way to prevent HCV transmission in dialysis unit, treating patients with DAA can further reduce the risk of transmission by reducing viraemia of infected patients.

Peritoneal dialysis recipients in Hospital Authority

99. Evidence on iatrogenic HCV transmission in patients receiving peritoneal dialysis is scarce mainly because the major mode of renal replacement therapy in developed countries is haemodialysis. However, peritoneal dialysis is the first-line option of renal replacement therapy in HA and the major mode of renal replacement therapy in Hong Kong.

100. Although the risk of HCV transmission should be lower in peritoneal dialysis, compared to haemodialysis, infection can still occur during exposure of body fluid or wound, like intermittent peritoneal dialysis or rapid fluid exchange, treatment of Tenckhoff catheter wound. In addition, a significant portion of patients on peritoneal dialysis may be switched to haemodialysis with time. Sometimes they may even require urgent haemodialysis due to acute medical condition. Therefore, DAA therapy is also beneficial to this group of patients.

DAA treatment in patients with end stage renal failure undergoing dialysis

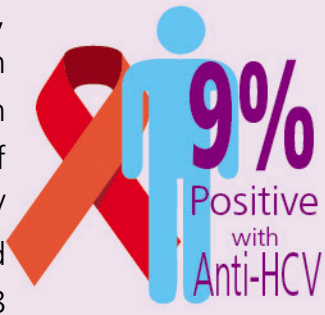
101. HCV infection was previously treated with interferons and ribavirin therapies. Both are eliminated by the kidneys, requiring significant dose reduction in patients with impaired kidney function. Interferon-based therapies have poor efficacy and a high adverse event rate in patients on dialysis. Now, treatment options have been expanded in dialysis recipients with approved DAA combinations, which are not eliminated by the kidney, and thus do not require dose adjustment [70].

Actions

4.3.1.1 A policy initiative to provide DAA for HCV treatment in all patients undergoing dialysis should be established.

4.3.1.2 DAA therapy should be provided to patients with end stage renal failure undergoing dialysis (both haemodialysis and peritoneal dialysis) in HA, irrespective of their liver fibrosis stage or candidacy for kidney transplant. It is expected that patients on dialysis, who are currently diagnosed with HCV infection, would all be treated by the second quarter of 2021.

Strategy 4.3.2
Screen and treat patients co-infected with human immunodeficiency virus



102. Both HIV and HCV infections are global health issues, with approximately 37.9 million and 71 million people living with HIV and chronic HCV infection respectively [2,71]. Owing to the shared mode of transmission, HCV is reported to affect 6.2% of HIV population worldwide, which is largely contributed by people who inject drugs (PWID) [72]. From 2008 to 2018, out of 4 186 patients with HIV in Hong Kong, screening showed that 377 (9%) were positive with anti-HCV [19].

103. HCV infection adversely affects clinical outcome in patients co-infected with HIV. With better antivirals and longer survival of patients with HIV/AIDS, liver disease is becoming one of the major causes of morbidity and mortality. HIV/HCV co-infection accelerates the development of HCV-related liver complications, such as cirrhosis and HCC [73]. In addition, chronic HCV infection increases the risk of drug induced liver toxicity in HIV patients receiving antiretroviral therapy.

104. In addition to curing individuals with HCV infection, offering DAA to HIV/HCV co-infected patients can also achieve "treatment as prevention" by reducing the transmission pool of HCV among HIV-positive people. Together with education and counselling on prevention of re-infection, elimination of HCV is possible in the HIV-positive population.

105. HIV/HCV co-infected patients currently under the care of HA or DH clinics represent an appropriate group for micro-elimination as they are already engaged in healthcare system with regular follow-up and monitoring.

DAA therapy in patients co-infected with HIV

106. Indication and choice of DAA is similar between mono-infected and co-infected patients. Comparably high efficacy of DAA is demonstrated in HIV/HCV co-infected population with cure rate over 90% [74]. The main consideration in prescribing DAA in co-infected patients is to be aware of potential drug-drug interaction with antiretroviral therapy.

Actions

4.3.2.1 A policy initiative to provide DAA for HCV treatment in all HIV-positive patients should be established.

4.3.2.2 DAA therapy would be adopted in patients co-infected with HCV and HIV, who are having follow-up in HIV clinics in HA and DH, irrespective of their liver fibrosis status. The initiative plans will start in 2020 - 21 with an aim to complete treating currently diagnosed HIV/HCV co-infected patients within 12 - 24 months.

4.3.2.3 The number of patients co-infected with HCV and HIV treated with DAA should be reviewed.

4.3.2.4 The risk of HCV re-infection among HIV-positive patients cured of HCV should be assessed.

Strategy 4.4: Promotion of HCV testing in people who inject drugs

107. The burden of HCV infection is considerable among PWID, with an estimated prevalence of greater than 40%, representing an estimated 6.1 million people worldwide who have recently injected drugs living with HCV infection [75]. As such, PWID are a priority population for enhancing prevention, testing, linkage to care, treatment and follow-up care in order to meet WHO hepatitis C elimination goals by 2030.

108. Testing current or former PWID for HCV infection is recommended by international guidelines. The Centers for Disease Control and Prevention in the United States also recommends that screening should include those who injected drugs only once [76].

109. Given the high prevalence of HCV in PWID in Hong Kong, testing HCV infection in PWID and linking them to treatment play a key role in promoting the achievement of the WHO elimination goals by 2030.

Treatment as prevention

110. Treatment can prevent further HCV transmission in the PWID population. There is growing evidence supporting the strategy of "treatment as prevention" to reduce transmission of HCV in PWID [77]. Several mathematical models have shown that even modest increases in successful HCV treatment among PWID can decrease prevalence and incidence [78,79]. The focus is now on how best to optimise treatment delivery to maximise the benefits of treatment as prevention strategy. As such, treatment scale-up amongst PWID are key to achieving these elimination targets, as shown in multiple HCV modelling studies [80,81].

111. PWID are a hard-to-reach population because they may not be able to adhere to the highly structured secondary or tertiary care settings in which HCV assessment and treatment are usually provided [82]. Recruiting PWID for health programme shall be considered in alternative institutions, such as methadone clinics and correctional facilities.

Methadone clinics

112. Hong Kong adopts a multi-modality approach in providing treatment and rehabilitation (T&R) services to meet the varying needs of drug abusers. DH operates the Methadone Treatment Programme (MTP) through its network of methadone clinics (MCs) for opiate abusers.

113. On admission to MTP, the doctor of MCs will conduct a detailed and structured assessment of the clients, which covers their medical, social history and physical conditions. Apart from medical assessments by doctors, services provided at the clinics include counselling, referral to other professional managements, and vaccinations.

Box 3. Services in methadone clinics

In Hong Kong, the Government is providing treatment of opioid abuse at methadone clinics.

Services available in methadone clinics include -

(i) medical assessment and health education;
(ii) dispensing of methadone for maintenance or detoxification therapy;
(iii) guidance and counselling by social workers; and
(iv) referral to other drug treatment service agencies as appropriate.

114. Currently, there are around 5 200 people registered with methadone clinics, with an average 3 900 daily attendance [83]. Hence, methadone clinic can serve as a platform where many PWID can be reached.

Correctional facilities

115. It has been reported that there are relatively high proportions of PWID among the prison population [84]. It is probably due to the criminalisation of drug use and the engagement in criminal activity to fund illicit drug habits [85,86].

116. There is oversea evidence indicating the feasibility and effectiveness of HCV treatment initiated in prisons, which can achieve a comparable or even better treatment outcomes than that for community-based treatment [87,88].

117. In Hong Kong, all correctional institutions have healthcare services. Persons in custody who need specialist care are referred to visiting specialists or public hospitals for follow-up.

HCV testing at community setting

118. To achieve good testing coverage by encouraging people coming forward for testing HCV, the principles of voluntary testing and confidentiality must be observed.

119. Quality-assured point-of-care tests (POCT) of anti-HCV, testing on finger-prick blood or oral fluid, have the potential to increase the number of people who get tested. Upon the delivery of POCT results, healthcare worker should take the opportunity to educate the individual about HCV infection, including its transmission, prevention and disease progression. For confirmed anti-HCV-positive cases, an HCV RNA test should be offered to diagnose a viraemic HCV infection.

Linkage to care

120. Following diagnosis of active HCV infection, all patients should be linked to a comprehensive HCV management. Of note, patient-level, structural and economic factors may hinder the successful uptake of testing and linkage to care and prevention for HCV infection among PWID.

Actions

4.4.1 A policy initiative to promote HCV testing in PWID, who are attending methadone clinics or under the custody of Correctional Services Department should be established. Successful implementation of the PWID-targeted programmes in these settings requires careful consideration of implications on the existing medical and nursing care, as well as management capacity from Specialist Out-patient Clinics of HA. Hence, it should be thoroughly discussed and planned to ensure satisfactory and sustainable linkage of care.

Initially, it can be achieved by the following actions.

4.4.2 Specific educational information about HCV transmission through contaminated needles, syringes and injection equipment, access to HCV testing and treatment should be provided to PWID.

4.4.3 Professional staff and other workers serving PWID at methadone clinics should be engaged to promote the importance of HCV infection.

4.4.4 Testing options and algorithms for carrying out HCV testing would be identified. A pilot programme involving selected MCs would be carried out to test the feasibility and assess the acceptance of HCV testing among PWID upon agreement on the details with the stakeholders. The information gained from the pilot can also help better characterise the barriers to HCV testing and care, and devise strategies to overcome them. Collaboration with academics for the exploration and identification of the optimal test-and-treat strategies in this hard-to-reach population should also be explored.

4.4.5 Staff of Correctional Services Department should be engaged and provided with health education about HCV infection.

Summary Table of Actions

Strategy 1: Awareness

	Action Plan	Action party	Timeline
1.1	**Awareness campaign for the general population**		
1.1.1	Revamp the website of Viral Hepatitis Control Office to provide up-to-date information and to improve user experience	DH	Completed
1.1.2	Review and update the information of the website of Viral Hepatitis Control Office	DH	2023Q2
1.1.3	Define yearly themes of awareness campaign across the territory	SCVH	Completed for 2020-22
1.1.4	Establish the yearly theme for 2023 – 2024	DH	2022Q4
1.1.5	Launch enhanced awareness campaign, involving Kwai Tsing District Health Centre	DH & DHC	2020Q3
1.2	**Professional training for healthcare workers**		
1.2.1	Conduct professional training programmes with the KAP assessment by phases, starting for obstetricians and midwives and extending to other groups of healthcare workers under the similar framework	HA, DH & constituent Colleges of Hong Kong Academy of Medicine	Yearly
1.3	**Education targeting at-risk populations, patients and their service providers**		
1.3.1	Develop focused education materials for pregnant women about preventive strategies of perinatal HBV transmission	DH & HA	2020Q4
1.3.2	Integrate education on safe injection and safer sex practices for prevention of HBV and HCV infection with HIV prevention programme	DH	Ongoing
1.3.3	Develop standardised training and education materials on HCV infection for service providers of PWID	DH, HA & NGOs	2022Q1
1.4	**Building a supportive environment**		
1.4.1	Enhance service capacity of testing and treatment for HBV and HCV infection	DH & HA	Ongoing
1.4.2	Evaluate HBV- and HCV-related service in the public sector to provide useful statistics and support the longer term planning and capacity building	HA	Ongoing

Strategy 2: Surveillance

Action Plan	Action party	Timeline
2.1 Continue surveillance of viral hepatitis and hepatitis B vaccination coverage	DH	Ongoing
2.2 Develop a set of local indicators for monitoring and evaluation of the viral hepatitis elimination strategies for HBV and HCV infection	SCVH	Completed
2.3 Update the HBV and HCV situation according to the results of the Population Health Survey (PHS)	DH	2022Q4
2.4 Adopt a consistent and sustainable approach for the measurement of the Local Indicators for 2015 and 2020	DH & HA	Ongoing

Strategy 3: Prevention

Action Plan		Action party	Timeline
3.1	**Reduce mother-to-child transmission of HBV**		
3.1.1	**Using antivirals to prevent MTCT of HBV**		
3.1.1.1	Establish a policy initiative to provide HBsAg-positive mothers with high viral load with a treatment option to use antivirals	SCVH	Completed
3.1.1.2	Refer all HBsAg-positive mothers in HA for care of HBV infection	HA	2021Q1
3.1.1.3	Start using antivirals to prevent MTCT in selected HA hospitals as pilot	HA	2020Q1
3.1.1.4	Start using antivirals to prevent MTCT in all HA birthing hospitals	HA	2020Q3
3.1.1.5	Provide professional training to specialists in O&G, public and private, about the use of antivirals to prevent MTCT	DH & HA	2021Q2
3.1.1.6	Review the acceptance of using antivirals to prevent MTCT	DH & HA	2022Q2
3.1.2	**Post-vaccination serologic testing**		
3.1.2.1	Establish a policy initiative to provide PVST to babies born to HBsAg-positive mothers	SCVH	Completed
3.1.2.2	Establish the implementation plan and resources implication of PVST	DH & HA	2020Q4
3.1.2.3	Provide professional training about PVST programme to obstetricians and paediatricians	DH & HA	2021Q3
3.1.2.4	Establish the logistics and workflow of PVST	DH & HA	2021Q4
3.1.2.5	Implement PVST programme	DH & HA	2022Q1
3.1.2.6	Review the acceptance of PVST programme	DH & HA	2023Q2

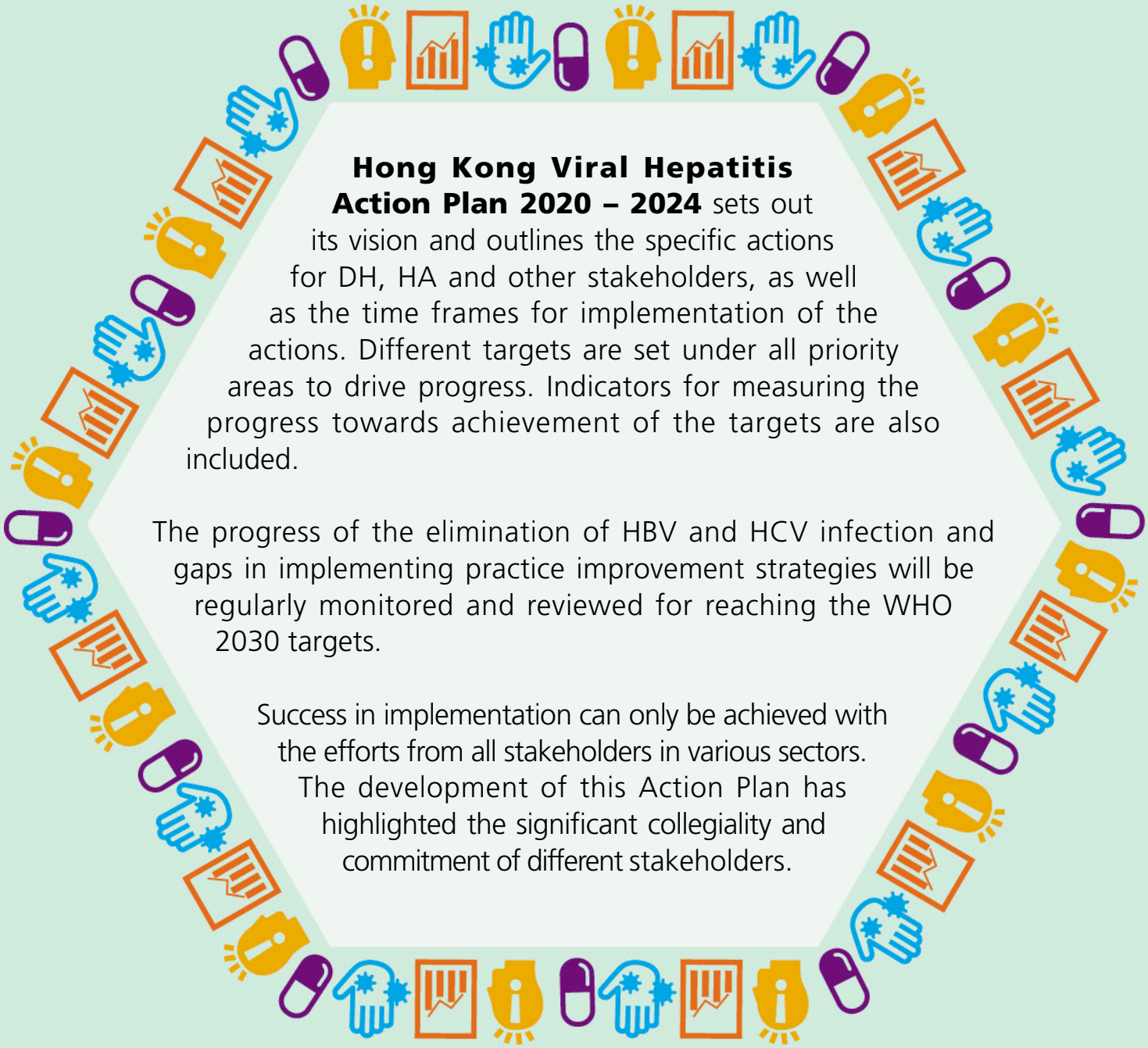
	Action Plan	Action party	Timeline
3.2	**Prevent healthcare-related transmission of HBV and HCV**		
3.2.1	Screen all blood donations in a quality-assured manner	HA	Ongoing
3.2.2	Provide treatment to people contracted HCV through blood / blood product transfusion	HA	Ongoing
3.2.3	Conduct regular infection control training, including Standard Precautions and sharps injury or mucosal contact prevention and management	DH & HA	Ongoing
3.3	**Reduce risk and disease burden in vulnerable populations**		
3.3.1	Intensify condom programming and take harm reduction approach	DH	Ongoing

Strategy 4: **Treatment**

	Action Plan	Action party	Timeline
4.1	**Enhancement of treatment for HBV infection**		
4.1.1	Augment diagnosis and treatment capacity for HBV infection, in terms of laboratory, equipment, drug and model of care	HA	Ongoing
4.1.2	Review the service provided by nurse clinics	HA	2022Q4
4.1.3	Engage HA hepatologists to explore strategies to enhance service capacity for HBV infection in both public and private settings	DH & HA	2021Q2
4.1.4	Engage primary care physicians to support management of HBV infection	DH & HA	2021Q4
4.1.5	Develop information resources to facilitate management of HBV infection by primary care physicians	DH & HA	2023Q1
4.1.6	Promulgate the information resources to primary care physicians	DH & HA	2023Q3
4.1.7	Estimate the service need of ultrasound for HCC surveillance	DH & HA	2021Q2
4.2	**Expansion of access to direct-acting antivirals for HCV**		
4.2.1	Establish a policy initiative to deploy DAA in HCV treatment in a stepwise manner	HA	Completed
4.2.2	Expand DAA treatment for hepatitis C patients with METAVIR fibrosis stages F2 or above	HA	Completed
4.2.3	Expand DAA treatment for all hepatitis C patients	HA	2021Q4
4.2.4	Review the number of patients treated with DAA	HA	2023Q1
4.3	**Micro-elimination of HCV infection**		
4.3.1	**Screen and treat patients with end stage renal failure on dialysis**		
4.3.1.1	Establish a policy initiative to provide DAA for HCV treatment in all patients undergoing dialysis	SCVH	Completed
4.3.1.2	Start using DAA to treat HCV infection in all patients undergoing dialysis	HA	2020Q1

Action Plan		Action party	Timeline
4.3.2.	**Screen and treat patients co-infected with human immunodeficiency virus**		
4.3.2.1	Establish a policy initiative to provide DAA for HCV treatment in all HIV-positive patients	SCVH	Completed
4.3.2.2	Start using DAA to treat HCV infection in all patients co-infected with HIV	DH & HA	2020Q4
4.3.2.3	Review the number of patients co-infected with HCV and HIV treated with DAA	DH & HA	2023Q2
4.3.2.4	Assess the number of re-infection among patients co-infected with HCV and HIV after completion of effective HCV treatment	DH & HA	2024Q2
4.4	**Promotion of HCV testing in people who inject drugs**		
4.4.1	Establish a policy initiative to promote HCV testing in PWID, who are attending methadone clinics (MCs) or under the custody of Correctional Services Department, for treatment	SCVH	Completed
4.4.2	Provide specific educational information about HCV transmission, testing and treatment to PWID	DH	2021Q1
4.4.3	Engage professional staff and other workers serving PWID at MCs by promoting the importance of HCV infection	DH	2021Q2
4.4.4	Identify testing options and algorithms for HCV testing, including the carrying out of a pilot programme, at MCs	DH	2021Q4
4.4.5	Educate and engage staff of Correctional Services Department	DH & CSD	2021Q4

Making It Happen



Hong Kong Viral Hepatitis Action Plan 2020 – 2024 sets out its vision and outlines the specific actions for DH, HA and other stakeholders, as well as the time frames for implementation of the actions. Different targets are set under all priority areas to drive progress. Indicators for measuring the progress towards achievement of the targets are also included.

The progress of the elimination of HBV and HCV infection and gaps in implementing practice improvement strategies will be regularly monitored and reviewed for reaching the WHO 2030 targets.

Success in implementation can only be achieved with the efforts from all stakeholders in various sectors. The development of this Action Plan has highlighted the significant collegiality and commitment of different stakeholders.

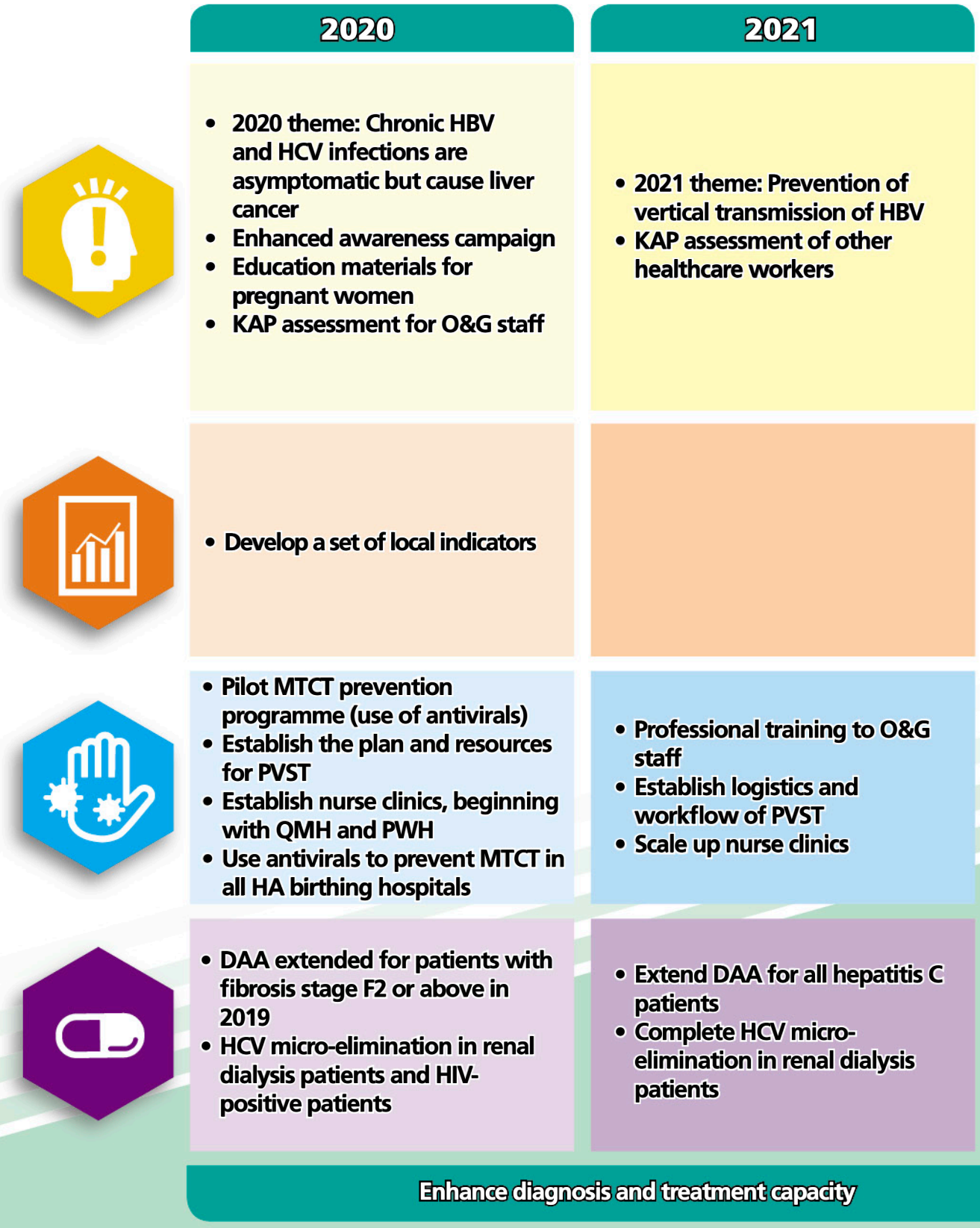


Figure 11. Highlight of key actions for 2020 - 2024

2022	2023	2024
• 2022 theme: HBV – get tested and treated • Develop education materials about HCV infection for PWID service providers • Establish the yearly theme of awareness campaign 2023 - 2024	• Review VHCO website	Review and Plan Ahead
• Update value of Local Indicators of 2020 • Update HBV and HCV situation according to PHS		
• Review the acceptance of using antivirals to prevent MTCT • Implementation of PVST	• Review the acceptance of PVST	
• Review the service provided by nurse clinics • Complete HCV micro-elimination in HIV-positive patients	• Develop and promulgate information resources to facilitate management of HBV infection by primary care • Review the number of patients treated with DAA	

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Abbreviations

AFP	Alpha-fetoprotein
AIDS	Acquired immune deficiency syndrome
Anti-HBs	Antibody against hepatitis B surface antigen
Anti-HCV	Antibody against hepatitis C virus
CSD	Correctional Services Department
DAA	Direct-acting antivirals
DHC	District Health Centre
DNA	Deoxyribonucleic acid
DH	Department of Health
HA	Hospital Authority
HBIG	Hepatitis B immunoglobulin
HBsAg	Hepatitis B surface antigen
HBV	Hepatitis B virus
HCC	Hepatocellular carcinoma
HCV	Hepatitis C virus
HIV	Human Immunodeficiency Virus
ICD	International Classification of Diseases
IQR	Inter-quartile range
ITC	Integrated Treatment Centre
KAP	Knowledge-attitude-practice
MC	Methadone clinic
MSM	Men who have sex with men
MTCT	Mother-to-child transmission
MTP	Methadone Treatment Programme
NGO	Non-governmental organisation
O&G	Obstetrics and Gynaecology
PHS	Population Health Survey
POCT	Point-of-care test
PVST	Post-vaccination serologic testing
PWH	Prince of Wales Hospital
PWID	People who inject drugs
QMH	Queen Mary Hospital
RNA	Ribonucleic acid
SCVH	Steering Committee on Prevention and Control of Viral Hepatitis
SVR	Sustained virological response
T&R	Treatment and rehabilitation
VL	Viral load
VHCO	Viral Hepatitis Control Office
WHO	World Health Organization
WPRO	Western Pacific Regional Office

Annex

Annex I. Twelve local indicators, global targets and the corresponding indicator measurement activities in Hong Kong for viral hepatitis elimination

Local indicator & definition	WHO targets	Data collection	Provisional figures
1. Prevalence of chronic HBV infection Number of persons with chronic HBV infection[1], divided by the number of persons (total population)	-	Population Health Survey by DH and literature review	7.2% (2016) [20] 6.4% (2016) [21]
2. Prevalence of chronic HCV infection Number of persons with chronic HCV infection[2], divided by the number of persons (total population)	-		0.5% (Anti-HCV+, 2016) [20] 0.3% (HCV RNA+, 2016) [20] 0.2% (HCV RNA+, 2015) [22]
3. Coverage of timely hepatitis B vaccine birth dose (within 24 hours) and other interventions to prevent MTCT of HBV Number of newborns receiving • timely birth dose of hepatitis B vaccine within 24 hours or • other interventions to prevent MTCT of HBV (e.g. administration of HBIG) divided by the number of live births	By 2020: 50% ; By 2030: 90%	Statistics on administration of timely hepatitis B vaccine birth dose, regularly collected by DH	>95%[3]
4. Coverage of third dose of hepatitis B vaccine among infants Number of infants (<12 months of age) who received the third dose of hepatitis B vaccine, divided by the number of infants (<12months of age in a year) surviving to age 1 year	By 2020: 90% ; By 2030: 90%	Immunisation Survey on Preschool Children by DH as proxy	**Coverage** Pre-school children 99.7%in 2018 [89] 99.2% in 2015 [90] **Timeliness** [89] Local children: 6.2 (IQR 6.1-6.4) months Non-local children: 6.4 (IQR 6.2-6.9) months

1 *Defined by HBsAg-positive serological status*
2 *Defined as positive for HCV RNA or HCV Ag*
3 *WHO-UNICEF Joint Reporting Form (data for 2019)*

Local indicator & definition	WHO targets	Data collection	Provisional figures
5. People living with HCV and/or HBV diagnosed Number of persons with chronic HBV and/or HCV infection who have been diagnosed, divided by the number of persons with chronic HBV and/or HCV infection	By 2020: 30% ; By 2030: 90%	Population Health Survey by DH and estimation from clinical and laboratory records in HA	-
6. Treatment coverage for hepatitis B patients Number of persons with chronic HBV infection[1] who are currently receiving treatment, divided by the number of persons with chronic HBV infection	80% of eligible persons with chronic HBV infection treated by 2030	Clinical, laboratory and prescription records in HA	-
7. Treatment initiation for hepatitis C patients Number of persons already diagnosed with chronic HCV infection[2] who initiated treatment during a specified time frame (e.g. 12 months), divided by the number of persons already diagnosed with chronic HCV infection[2] for the specified time period (12 months)	80% of eligible persons with chronic HCV infection treated by 2030		-
8. Viral suppression for chronic hepatitis B patients treated Number of patients with chronic HBV infection on treatment who have a suppressed viral load(VL)[4], divided by the number of patients with chronic HBV infection on treatment and assessed for VL in the past 12 months	-		-

4 HBV DNA not detectable, based on VL measurement in the past 12 months

Local indicator & definition	WHO targets	Data collection	Provisional figures
9. Cure for chronic hepatitis C patients treated Number of patients who completed HCV treatment and had a sustained virological response (SVR)[5], divided by the number of patients who completed HCV treatment and were assessed for SVR 12 - 24 weeks after the end of treatment (in the past 12 months)	-	Clinical, laboratory and prescription records in HA	-
10. Cumulated incidence of HBV infection in children 5 years of age Number of survey children 5 years of age living with biomarkers of past or present infection and/or chronic infection, divided by the number of children aged 5 years of age in surveys	By 2020: 30% reduction[6]; By 2030: 90% reduction[7] (as compared with the baseline number in 2015)	Biomarker survey or mathematical modelling	0.78% (children aged 12 – 15 years in 2009)[18]
11. Incidence of HCV infection Total number of new infections with HCV[8], divided by the total population minus people living with hepatitis C	By 2020: 30% reduction; By 2030: 90% reduction (as compared with the baseline number in 2015)	Modelling with inputs from repeated surveys, including Population Health Survey by DH and published studies among PWID and MSM	Number of reported acute cases: 34 (2018) 18 (2017) 39 (2016) 14 (2015)
12. Deaths attributable to HBV and HCV infection Number of deaths from • hepatocellular carcinoma (HCC) (ICD-10 code C22.0), • cirrhosis (ICD-10 codes K74.3, K74.4, K74.5, K74.6) and • chronic liver diseases (ICD-10 codes K72–K75) attributable to HBV and HCV infection	By 2020: 10% reduction; By 2030: 65% reduction (as compared with the baseline number in 2015)	Review of death statistics in DH to identify related deaths; Attributable fraction to HBV and HCV by reviewing their respective clinical and/or laboratory records in HA	-

5 Based on VL measurement 12-24 weeks after the end of treatment (in the past 12 months)
6 Equivalent to 1% prevalence of HBsAg among children
7 Equivalent to 0.1% prevalence of HBsAg among children
8 Defined as anti-HCV positive per year

Annex II. Steering Committee on Prevention and Control of Viral Hepatitis – terms of reference and membership

Terms of Reference

1. To keep in view local and international developments in the prevention and control of viral hepatitis;
2. To advise the Government on overall policy, targeted strategies, and effective resource allocation related to prevention and control of viral hepatitis with a view to formulating an Action Plan; and
3. To conduct and coordinate monitoring and evaluation of viral hepatitis control as set out in the Action Plan, and recommend appropriate response.

Co-chairpersons

Dr. CHAN Hon-yee, Constance, JP
Dr. LEUNG Pak-yin, JP (till July 2019)
Dr. KO Pat-sing, Tony (since August 2019)

Members

Prof. CHAN Lik-yuen, Henry
Dr. CHAN Chi-wai, Rickjason (since April 2019)
Dr. CHAN Ming-wai, Angus
Dr. HO Ka-wai, Rita (till February 2019)
Dr. LO Yee-chi, Janice (till March 2019)
Dr. LO Yim-chong (since February 2019)
Dr. LAI Sik-to
Dr. LAO Wai-cheung
Prof. LAU Yu-lung
Prof. LEE Shui-shan
Dr. LEUNG Wai-yee, Nancy (till July 2020)
Dr. LEUNG Wing-cheong
Dr. TSANG Tak-yin, Owen
Prof. YUEN Man-fung

Ex-officio members

Dr. WONG Ka-hing, JP
Dr. CHUNG Kin-lai
Mr. CHAN Wai-kee, Howard, JP

Secretary

Dr. CHAN Chi-wai, Kenny (till November 2018)
Dr. LAM Kit-yi, Rebecca (since November 2018)

Annex III. Clinical Working Group – terms of reference and membership

Terms of Reference

1. To provide input to and implement the Hong Kong Action Plan for Prevention and Control of Viral Hepatitis;
2. To review and evaluate the service load and gaps in diagnosis, treatment and monitoring; and strengthen related service provision and staff training for viral hepatitis;
3. To oversee the effective linkage of persons with viral hepatitis to treatment and care; and
4. To devise, evaluate, update and implement cost-effective management guidance and protocols for viral hepatitis.

Convenor

Dr. LAU Ka-hin
(since June 2019)
Dr. SO Wing-yee
(till June 2019)

Members

Dr. CHAN Chi-wai, Kenny
(till November 2018)
Dr. Chan Man-chi, Grace
(since May 2020)
Dr. CHAN Ming-wai, Angus
Dr. CHAN Pang-fai
Dr. FUNG Yan-yue, James
Dr. HUI Yee-tak
Dr. KAN Yee-ling, Elaine
Dr. KWAN Yat-wah, Mike
Mr. KWONG Yiu-sum, Benjamin
(till May 2020)
Dr. LAM Kit-yi, Rebecca
(since November 2018)
Dr. LAO Wai-cheung
Dr. LAW Chun-bon
(till December 2019)
Dr. WONG Han, Ann
Prof. WONG Wai-sun, Vincent

Co-opt members

Ms. CHEUNG Kar-yee, Celia
(till November 2019)
Mr. CHEUNG Tak-lun, Alan
(since November 2019)
Dr. FUNG Wai-kwan, Barbara
Dr. LEUNG Wing-cheong
Ms. TSUI Lai-hing, Eva
Dr. WOO Pao-sun, Pauline
(till August 2019)

Secretary

Ms. CHAN Sin-yee, May

Annex IV. Public Health Working Group – terms of reference and membership

Terms of Reference

1. To provide input to and implement the Hong Kong Action Plan for Prevention and Control of Viral Hepatitis;
2. To evaluate, revise and strengthen surveillance of viral hepatitis in Hong Kong;
3. To promote awareness and advise on screening of viral hepatitis for the public and healthcare providers;
4. To assist in education programmes to update healthcare providers related to viral hepatitis; and
5. To enlist and partner with community and professional stakeholders according to strategy consideration.

Convenor

Dr. CHAN Chi-wai, Kenny (till November 2018)
Dr. LAM Kit-yi, Rebecca (since November 2018)

Members

Dr. CHAN Chi-wai, Rickjason (since April 2019)
Dr. CHEN Hong (since December 2019)
Dr. LAU Ka-hin (since June 2019)
Dr. LEUNG Oi-shan, Joanna
Dr. LO Yee-chi, Janice (till March 2019)
Dr. SO Wing-yee (till June 2019)
Dr. TSANG Chiu-yin, Chester
Dr. WONG Miu-ling
Dr. WONG Tin-yau, Andrew (till December 2019)

Co-opt members

Ms. CHEUNG Kar-yee, Celia (till November 2019)
Mr. CHEUNG Tak-lun, Alan (since November 2019)
Dr. WOO Pao-sun, Pauline (till August 2019)

Secretary

Dr. KWOK Lai-key, Priscilla (since January 2019)
Dr. WONG Chun-kwan, Bonnie (till January 2019)