

Chapter

Global Progress toward Viral Hepatitis Elimination

Homie Razavi, Ivane Gamkrelidze, Kathryn Razavi-Shearer, Alexis Voeller, Samantha Hall, Carolyn Wallace and Devin Razavi-Shearer

Abstract

Despite global commitments to eliminate viral hepatitis by 2030, progress remains uneven. The Polaris Observatory tracks data from over 170 countries to evaluate hepatitis B (HBV) and C (HCV) elimination. While some nations have made significant strides—particularly in HCV treatment and HBV vaccination—few are on track to meet WHO’s full elimination targets. Barriers include complex HBV treatment guidelines, limited testing access, and underinvestment. Conversely, success in HCV elimination has been driven by political commitment, affordable diagnostics and drugs, and decentralized service delivery. Strategic simplification of HBV guidelines and expanded investment are essential to prevent HBV and HCV from becoming the leading causes of infectious disease mortality.

Keywords: hepatitis B virus (HBV), hepatitis C virus (HCV), liver-related mortality, HBV vaccination, HCV treatment

1. Introduction

The 69th World Health Assembly endorsed the Global Health Sector Strategy for Viral Hepatitis, including a goal to eliminate hepatitis infection as a public health threat by 2030 [1, 2], and the World Health Organization (WHO) introduced global targets for the care and management of hepatitis [2]. These goals include the introduction of blood and injection safety and harm reduction programs to reduce new infections by 80–95%, diagnosing 90% of the hepatitis C virus (HCV) and hepatitis B virus (HBV) infected populations, treating 80% of the eligible population, and reducing liver-related deaths by 65% by 2030 relative to the benchmark levels in 2015 (**Table 1**) [2]. Absolute targets for incidence and mortality were added to incentivize countries that had already initiated their elimination programs prior to 2015 (**Table 1**) [3].

In 2015, the Center for Disease Analysis created a universal registry, the Polaris Observatory, to support informed decision-making at the national, regional, and global level for HCV and HBV elimination. The observatory covers 118 countries for HCV and 171 countries for HBV and provides decision analytics, disease burden modeling, economic impact assessments, and training to help countries with their national hepatitis

Elimination Targets	Elimination of Chronic HBV Infection as a Public Health Problem		Elimination of Chronic HCV Infection as a Public Health Problem	
2030 GHSS relative reduction reference targets (compared to 2015)	Incidence 95% reduction	Mortality 65% reduction	Incidence 80% reduction	Mortality 65% reduction
HBV- and HCV-specific absolute prevalence, incidence and mortality targets	HBV elimination of MTCT ≤0.1% HBsAg prevalence in children aged ≤5 years	Annual mortality (HBV) ≤4/100,000	Annual incidence (HCV) ≤5/100,000 ≤2/100 (PWID)	Annual mortality (HCV) ≤2/100,000
Programmatic targets	Countries with universal HBV vaccine BD ≥90% HepB3 vaccine coverage ≥90% HepB timely HepB-BD coverage	Testing and treatment ≥90% of people with HBV diagnosed ≥80% of people diagnosed with HBV and eligible for treatment are treated	<i>Testing and treatment</i> ≥90% of people with HCV diagnosed ≥80% of people diagnosed with HCV are treated	
	Countries with targeted HBV vaccine BD ≥90% HepB3 vaccine coverage ≥90% coverage of those infants at risk with targeted HepB-BD ≥90% coverage of maternal antenatal HBsAg testing ≥90% coverage with antivirals for those eligible	Prevention ≥90% HepB3 vaccine coverage ≥90% HepB-BD coverage	Prevention 0% unsafe injections 100% blood safety 300 needles/syringes/PWID/year	

Table 1.
WHO elimination targets.

elimination programs. By providing reliable and up-to-date country specific data and analyses, demonstrating the impact of decisions, and providing cost estimates of national programs, collaborating countries are more likely to make informed decisions. Economic impact analyses also help countries fund their elimination programs and negotiate prices.

The Polaris Observatory collects data from all collaborating countries and updates all HCV and HBV Markov models annually to estimate when countries will achieve the WHO elimination targets. The data are used to track progress toward the global elimination of HCV and HBV.

2. Elimination of viral hepatitis is important

Every 30 seconds someone dies of their HCV and HBV infections globally. Nine years after the original WHO targets were set, only 21% of all HCV infections and 25% of all HBV infections have been diagnosed and HBV treatment remains close to 3% of total infections [4]. As shown in **Figure 1**, without additional interventions, the number of liver related deaths attributed to HCV and HBV is expected to increase making these infections the deadliest infections in the world surpassing TB, HIV, and sexually transmission infections [4].

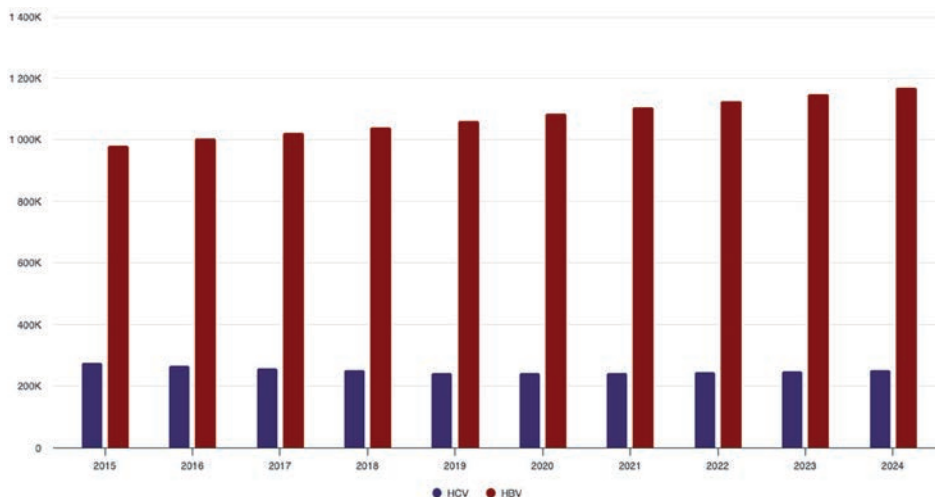


Figure 1.
Annual liver related deaths due HCV and HBV.

The prevalence distribution of HCV infections is shown in **Figure 2** [5]. As compared to 2015 (**Figure 3**), there has been a substantial decrease in HCV infections globally as result of national program demonstrating that national elimination efforts can reduce/elimination HCV infections.

The prevalence of HBV infections remains high in sub-Saharan Africa due to very low treatment and limited HBV birth dose vaccination (**Figure 4**) [5]. China has been able to reduce its HBV prevalence through a national vaccination program but still accounts for 29% of HBV infections in the world. Globally, India has the second highest number of HBV infections in the world, despite a low prevalence, due to the very large population in the country.

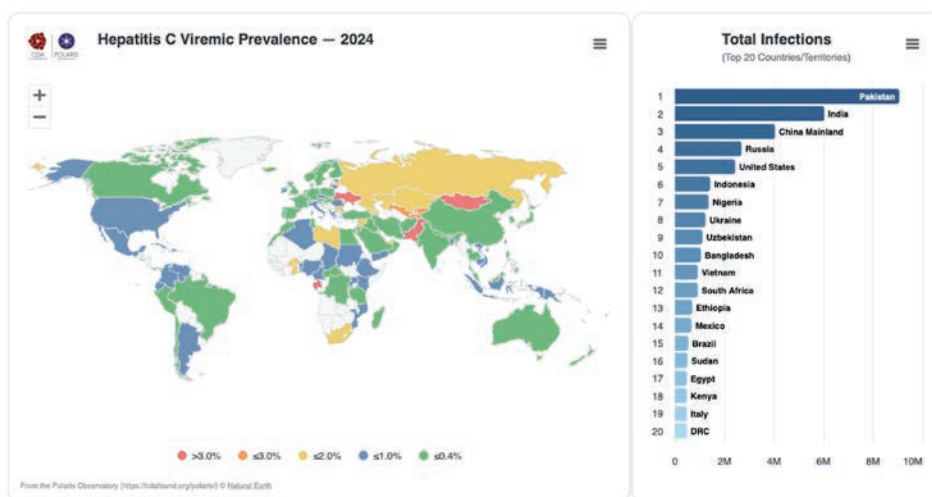


Figure 2.
Prevalence of HCV infections in 2024.

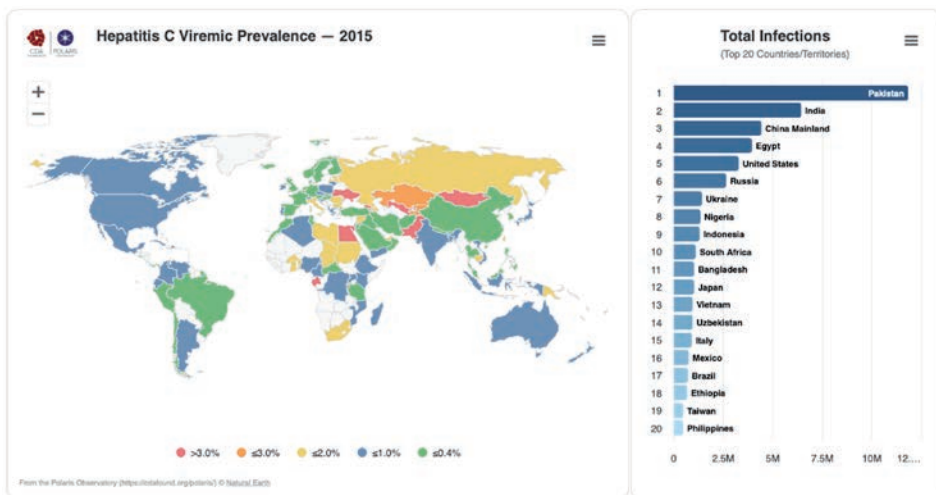


Figure 3.
Prevalence of HCV infections in 2015.

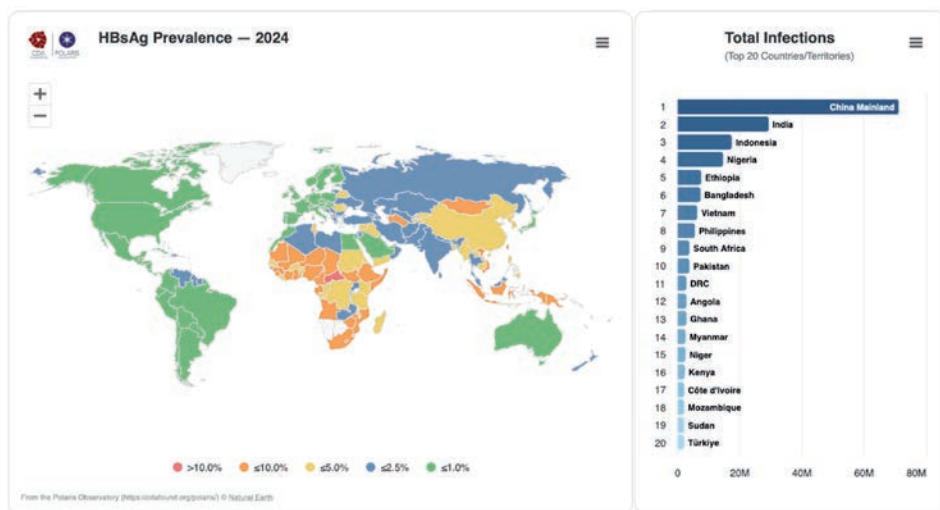


Figure 4.
Prevalence of HBV infections in 2024.

3. Progress toward global HBV elimination targets

In most countries, HBV birth dose and three dose vaccination started long before the WHO elimination targets were established. As such, an estimate 85 countries are on track to achieve an HBV prevalence of $\leq 0.1\%$ among children ≤ 5 -years-old before 2030 (Figure 5, Table 2) [6]. Countries not on track are concentrated in sub-Saharan Africa where birth dose vaccination is low or non-existent and South East Asia where birth and three dose vaccination rates have been less than 90% of total births.

Countries with a low HBV prevalence are likely to achieve WHO’s absolute target for mortality ($\leq 4/100,000$) purely due to the low prevalence of HBV (Figure 6).

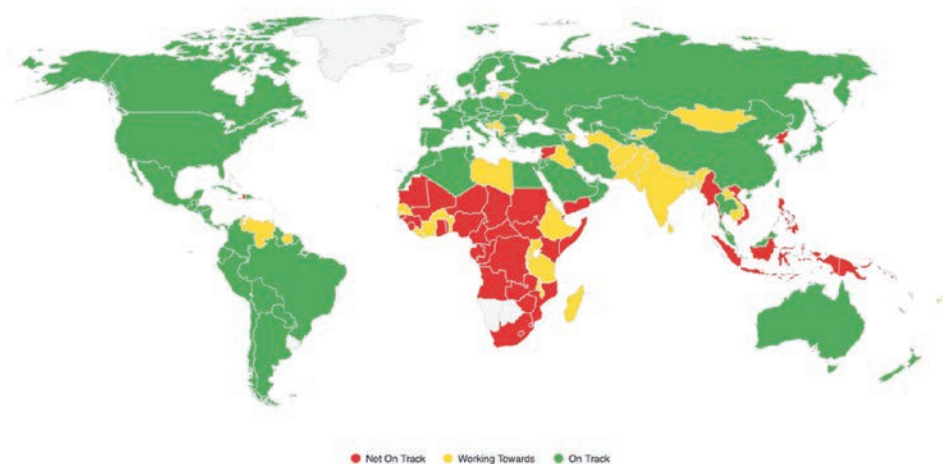


Figure 5.
 Countries on track to achieve HBV prevalence among ≤ 5 -years-olds.

Algeria	Gambia	Panama
Argentina	Georgia	Paraguay
Armenia	Germany	Peru
Australia	Greece	Poland
Austria	Guatemala	Portugal
Bahrain	Guyana	Qatar
Belarus	Honduras	Romania
Belgium	Hong Kong	Russia
Belize	Hungary	Saudi Arabia
Bhutan	Iran	Singapore
Bolivia	Ireland	Slovakia
Brazil	Israel	Slovenia
Bulgaria	Italy	Spain
Canada	Japan	Sweden
Chile	Jordan	Switzerland
China Mainland	Kazakhstan	Taiwan
Colombia	Korea, Republic of	Tajikistan
Costa Rica	Kosovo	Thailand
Croatia	Kuwait	Trinidad and Tobago
Cuba	Lebanon	Tunisia
Czechia	Malaysia	Türkiye
Denmark	Malta	Ukraine
Dominican Republic	Mexico	United Arab Emirates
Ecuador	Morocco	United Kingdom
Egypt	Netherlands	United States

El Salvador	New Zealand	Uzbekistan
Estonia	Nicaragua	
Finland	Norway	

Table 2.
Countries on track to achieve HBV prevalence among ≤ 5 -years-olds.

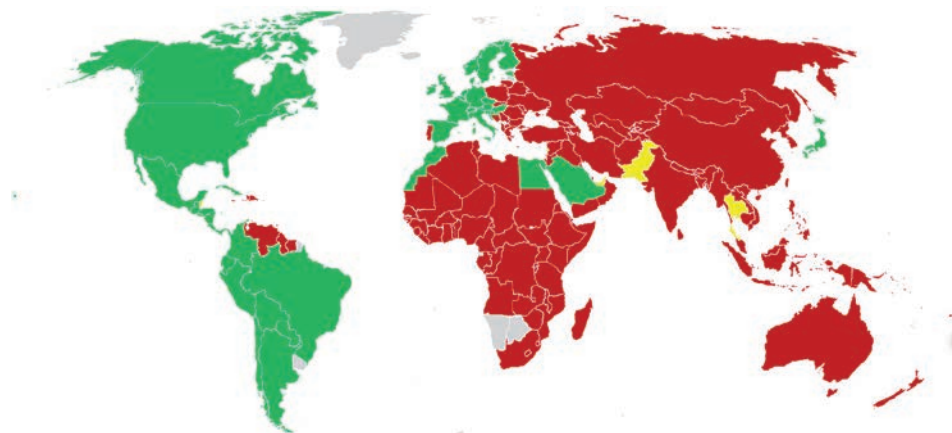


Figure 6.
Countries on track to achieve HBV prevalence among ≤ 5 -years-olds and mortality target of $\leq 4/100,000$.

These countries are concentrated in the Americas and Europe with the addition of Japan, Saudi Arabia, Egypt, and Morocco. HBV prevalence in these countries is less than 1% resulting in a low number of deaths overall.

However, no country is currently on track to meet the programmatic targets of diagnosing 90% of HBV infections and treating 80% of the eligible infections. Based on the current data, it is unlikely any country will achieve all WHO elimination targets for HBV by 2030. Thus far, most countries have focused their viral hepatitis elimination programs on HCV elimination and HBV vaccination. This is partly due to the very complex HBV treatment guidelines that require multiple lab tests to define treatment eligibility and follow-up of patients who are ineligible for treatment (for an example, see EASL guidelines in **Table 3**). In practice, these guidelines may work in high-income countries where access to lab tests is readily available and reimbursed. However, in low- and middle-income countries, these guidelines are too difficult or expensive to follow. In response, WHO issued its updated guidelines in 2024 (**Table 3**) that simplifies the number of tests required to initiate treatment. However, the simplest guidelines in the world were developed by China that has 70% of all HBV infections. These guidelines allow for screening of the adult population and treatment of those over the age of 30 years old.

4. Progress toward global HCV elimination targets

Since 2015, there have been curative treatments available for HCV. The year 2023 marked the 10-year anniversary of the launch of direct-acting antivirals (DAAs) for

EASL 2017 [7]	WHO 2024 [8]	China 2023 [9]
<p>Treat:</p> <ul style="list-style-type: none"> • Patients with HBeAg-positivity • HBV DNA >2000 IU/mL, ALT>ULN and/or moderate necroinflammation or fibrosis • Patients with HBV DNA >20,000 IU/mL and ALT>2xULN should be treated independent of fibrosis levels • Patients with HBeAg-positivity, normal ALT, and high HBV DNA levels may be put on treatment if they are older than 30 • All patients with a family history of HCC, cirrhosis and extrahepatic manifestations should be treated. • All patients with compensated or decompensated cirrhosis should always be treated 	<p>Treat all HBsAg positive adults and adolescents 12 and older (pregnant women and girls are included) with:</p> <ul style="list-style-type: none"> • F2 fibrosis or higher based on APRI score of >0.5 or transient elastography value of >7 kPa or cirrhosis regardless of HBV DNA or ALT levels • OR • HBV DNA >2000 IU/mL and ALT level above ULN (30 U/L-men and 19 U/L:-women), for adolescents, this is based on ALT>ULN in at least two tests within a 6–12-month period • OR • Presence of coinfection (HIV, HDV or HCV), family history of liver cancer or cirrhosis, immune suppression (long-term steroid use, organ or cell transplant), comorbidities (diabetes, metabolic dysfunction-association steatotic liver disease), or extrahepatic manifestations (glomerulonephritis or vasculitis), regardless of APRI score of HBV DNA or ALT levels • OR • Continued abnormal ALT levels alone (two ALT levels above ULN at intervals during a 6–12-month period) regardless of APRI score (this is used in the absence of access to an HBV DNA assay) 	<p>Treat all HBsAg-positive and detectable HBV DNA:</p> <ul style="list-style-type: none"> • ALT<ULN, one of the following situations is met if: <ol style="list-style-type: none"> 1. Age > 30 years old 2. Family history of HBV-related cirrhosis or HCC 3. fibrosis of F2 or higher or significant inflammation of G2 or higher 4. HBV-related extrahepatic manifestations <p>OR</p> <ul style="list-style-type: none"> • ALT>ULN, exclude other causes of ALT elevation • Antiviral therapy is recommended for patients with detectable HBV DNA and persistently elevated ALT levels • Antiviral therapy is also recommended for HBV-related compensated or decompensated cirrhosis regardless of ALT levels, HBV DNA levels or HBeAg status

Table 3. Comparison of the European Association for the Study of Liver (EASL), WHO, and Chinese HBV testing and treatment guidelines.

treating the hepatitis C virus (HCV), an infection that affects 50 million people globally and leads to 244 thousand deaths, primarily from cancer and liver cirrhosis [10]. Compared to their predecessors, DAAs demonstrate a high sustained viral response (>95%), minimal side effects, and a short treatment duration (~8–12 weeks). This has resulted in many more countries pursuing HCV elimination strategies. As shown in **Figure 7**, there are 11 countries (Australia, Austria, Denmark, Egypt, Finland, France, Iceland, Norway, Saudi Arabia, Spain, and United Kingdom) that are on track to achieve all WHO elimination targets by 2030 with another 15 countries on track to achieve these targets before 2050.

The global HCV elimination efforts have seen a large increase in HCV diagnosis and treatment (**Figure 8**) with 12.7 million HCV infections treated by 2024 [11]. Middle-income countries were leaders in expanding HCV treatment with Egypt and Pakistan accounting for 45% of all HCV treatments globally between 2014 and 2024. Successful HCV elimination programs all have similar characteristics—(1) country’s commitment to elimination, which led to removal of obstacles as

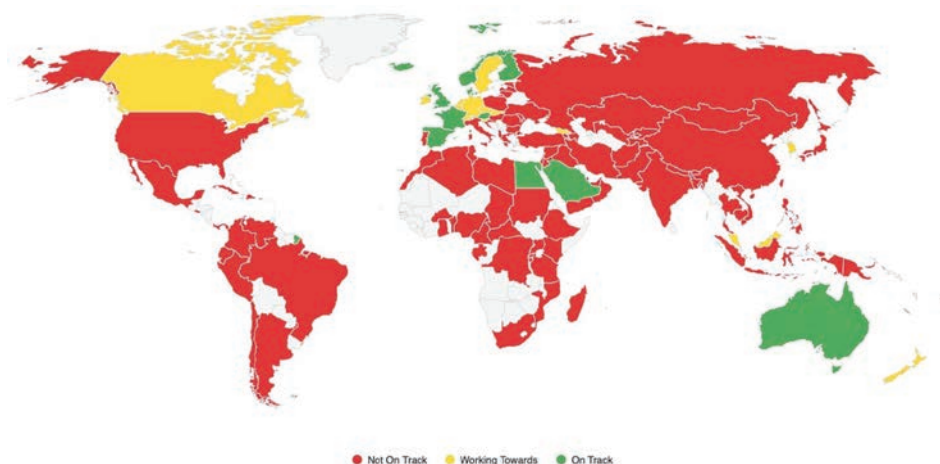


Figure 7.
Countries on track to achieve all HCV elimination targets.

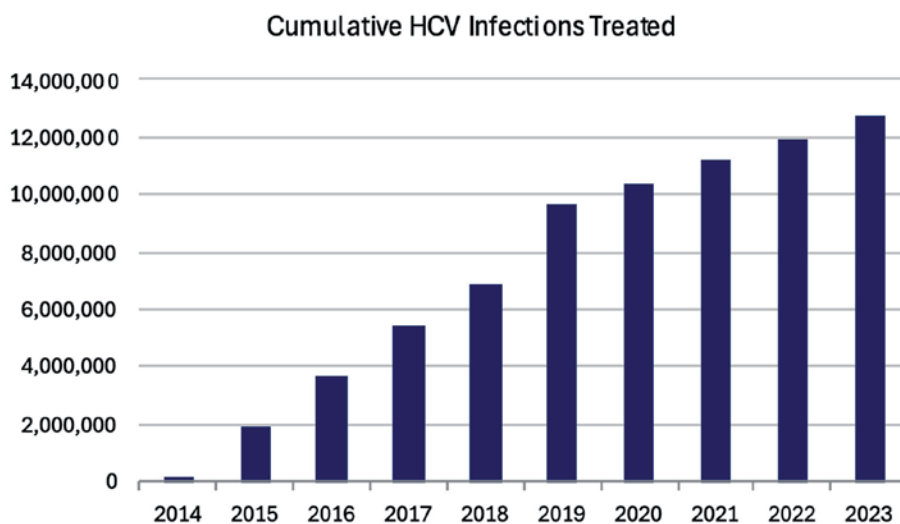


Figure 8.
Total number of HCV infections treated in 2014–2024.

they emerged; (2) adequately financing the national program; (3) implementing awareness and linkage to care programs; (4) collaborating with drug manufacturers to ensure a steady supply of medicine at an affordable price; (5) negotiating with diagnostic companies to get a steady supply of lab reagents; (6) training enough healthcare and community workers to support a national rollout; (7) creating a robust health information system to track progress; and (8) decentralizing service delivery allowing screening and linkage to care in rural villages and small towns. In the last 10 years, DAAs have cured 21% of the HCV infections worldwide and 30% of the target population (taking into consideration 90% diagnosis and 80% treatment targets).

5. Conclusion

Five years remain before countries must meet the original targets set by the World Health Organization and endorsed by the Ministries of Health. The tools necessary to eliminate both HCV and HBV are currently available and can be utilized to prevent viral hepatitis from becoming the leading cause of death among all infectious diseases.


The subsequent chapters of this book provide a detailed analysis of how individual countries successfully developed and implemented their national elimination programs. This book serves as a valuable resource, offering a template that can assist other countries in developing their own comprehensive national programs to eliminate HCV and HBV from their populations.

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