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Public Health Awareness and Elimination Programs for Viral Hepatitis: A Global Review

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Abstract

Viral hepatitis, caused predominantly by hepatitis B virus (HBV) and hepatitis C virus (HCV), remains one of the leading infectious causes of death worldwide, killing more people each year than tuberculosis and rivaling the mortality of HIV/AIDS and malaria combined in some recent estimates. In 2016, the World Health Assembly adopted the Global Health Sector Strategy (GHSS) on Viral Hepatitis, setting a target to eliminate viral hepatitis as a public health threat by 2030, defined operationally as a 90% reduction in new chronic infections and a 65% reduction in hepatitis-related mortality relative to 2015 levels. This review synthesizes current epidemiological data, the architecture of global and national elimination strategies, the role of public health awareness campaigns, and the structural gaps that continue to threaten achievement of the 2030 goal. Drawing on World Health Organization (WHO) reporting, the Lancet Gastroenterology & Hepatology Commission, and the peer-reviewed literature on hepatitis-related stigma and health communication, the review examines five interlocking program components, vaccination, prevention of mother-to-child transmission, blood and injection safety, harm reduction, and testing and treatment, alongside the awareness and demand-generation activities that determine whether these services reach the people who need them. Country experience, most notably Egypt's attainment of WHO 'gold tier' validation for hepatitis C, illustrates that elimination is technically and programmatically achievable when political commitment, affordable diagnostics and curative therapy, and sustained public communication are combined. However, global data through 2024 show that progress remains markedly uneven: birth-dose hepatitis B vaccination coverage remains far below target, diagnosis and treatment coverage gaps persist across low- and middle-income countries, and stigma continues to suppress testing uptake even where services exist. The review concludes that closing the diagnosis-and-treatment gap, accelerating timely birth-dose vaccination, and sustaining risk-group-specific, stigma-reducing awareness efforts are the most immediately actionable levers for the remaining years to 2030.

Keywords: viral hepatitis; hepatitis B; hepatitis C; disease elimination; public health awareness; WHO Global Health Sector Strategy; vaccination; stigma; screening and treatment.

1. Introduction

Viral hepatitis refers to inflammation of the liver caused by one of five distinct hepatotropic viruses, designated hepatitis A, B, C, D, and E. Hepatitis A and E are typically transmitted through contaminated food or water and cause acute, usually self-limiting illness, whereas hepatitis B, C, and D are predominantly bloodborne or sexually transmitted and are capable of establishing lifelong chronic infection. Of the five, hepatitis B and C are responsible for the overwhelming majority of chronic disease burden, since both can persist silently for decades before progressing to cirrhosis, liver failure, or hepatocellular carcinoma. Hepatitis D occurs only as a co-infection or superinfection in people already infected with hepatitis B and substantially accelerates progression to severe liver disease in those affected.

The defining public health challenge of chronic viral hepatitis is its near-total invisibility in the early stages of infection. Because most people with chronic HBV or HCV infection remain asymptomatic for years, the large majority of those infected are unaware of their status until advanced liver disease has already developed. This asymptomatic latency period distinguishes hepatitis from many other high-burden infectious diseases and places public awareness, community and provider education, risk-based and routine screening, and rapid linkage to care at the center of any credible elimination strategy. A vaccine, curative antiviral therapy, and effective prevention tools for hepatitis B and C already exist; what is comparatively underdeveloped is the public health infrastructure required to find the undiagnosed, connect them to treatment, and sustain the political and financial commitment needed to do so at scale.

In 2016, the Sixty-Ninth World Health Assembly formally endorsed the goal of eliminating viral hepatitis as a public health threat by 2030, embedding it within the WHO Global Health Sector Strategy on Viral Hepatitis and, from 2022 onward, within a combined strategy addressing HIV, viral hepatitis, and sexually transmitted infections. This review examines the epidemiological scale of the problem, the structure of the global elimination strategy and its five core intervention pillars, the specific role that public awareness programs play in closing the diagnosis and stigma gap, illustrative country experience, and the barriers that continue to slow progress toward 2030. It closes with a set of priority actions most likely to accelerate progress in the years remaining.

2. Main Review

2.1 Global Burden of Disease

The scale of chronic viral hepatitis rivals or exceeds that of many better-resourced global health priorities. WHO's most recent comprehensive assessment estimated that 287 million people were living with chronic hepatitis B or C infection in 2024, roughly three percent of the world's population, with testing and treatment access remaining out of reach for the majority of them. Hepatitis B and C together account for approximately 95% of all hepatitis-related deaths globally. Mortality has continued to climb even as diagnostic and treatment tools have improved: deaths

attributable to viral hepatitis rose from an estimated 1.1 million in 2019 to 1.3 million in 2022, and the most recent WHO Global Hepatitis Report, presented at the 2026 World Hepatitis Summit, placed the 2024 death toll at 1.34 million. Transmission also continues at a substantial pace, with roughly 1.8 million new hepatitis B and C infections recorded in 2024 alone, equivalent to more than 4,900 new infections every day.

The distribution of this burden is highly uneven. The WHO African Region accounted for 68% of new hepatitis B infections in 2024, yet only 17% of newborns in the region received a timely hepatitis B birth-dose vaccination, a critical prevention gap given that perinatal and early-childhood transmission carries by far the highest risk of chronic infection. For hepatitis C, people who inject drugs accounted for 44% of new infections globally, underscoring the centrality of harm-reduction services to any transmission-reduction strategy. Ten countries, Bangladesh, China, Ethiopia, Ghana, India, Indonesia, Nigeria, the Philippines, South Africa, and Viet Nam, accounted for 69% of hepatitis B-related deaths worldwide in 2024, while a different but overlapping set of ten countries accounted for 58% of hepatitis C-related deaths. The Lancet Gastroenterology & Hepatology Commission has separately estimated that the twenty highest-burdened countries, ranked by disability-adjusted life years, account for more than 75% of the global burden of viral hepatitis, meaning that an effective global response depends disproportionately on progress within a relatively small number of national programs.

There are indications of genuine progress alongside these sobering totals. Between 2015 and 2024, the annual number of new hepatitis B infections is estimated to have fallen by roughly 32%, and hepatitis C-related deaths are estimated to have declined by about 12% over the same period, driven substantially by the scale-up of direct-acting antiviral therapy. Hepatitis B prevalence among children under five years of age fell from approximately 0.8% in 2015 to 0.6% in 2024, with 85 countries now reporting prevalence at or below the 2030 target of 0.1% in this age group, a marker of the cumulative effect of infant vaccination programs. These gains demonstrate that the trajectory of the epidemic can be bent, even as the report accompanying this data cautions that current rates of progress remain insufficient to meet the full set of 2030 targets.

2.2 The WHO Global Elimination Strategy

The foundation of the global response is the WHO Global Health Sector Strategy (GHSS) on HIV, Viral Hepatitis and Sexually Transmitted Infections 2022–2030, which reaffirmed and extended the original 2016–2021 hepatitis strategy. The strategy's core numerical targets for 2030, benchmarked against a 2015 baseline, include a 90% reduction in new chronic hepatitis B and C infections, a 65% reduction in hepatitis-related mortality, diagnosis of at least 90% of people living with chronic HBV or HCV infection, provision of treatment to at least 80% of those diagnosed and eligible, and universal, quality-assured screening of blood donations alongside safe injection and surgical practices. In absolute terms, WHO has translated the incidence and mortality targets into concrete numbers: fewer than 520,000 new hepatitis infections and fewer than 450,000 hepatitis-related deaths annually by 2030, down from an estimated 6–10 million new chronic infections and roughly 1.4 million deaths per year at the 2015 baseline.

National action under the strategy is organized around five major categories of intervention, often summarized in public communication as "Test. Treat. Vaccinate.": (1) vaccination, including hepatitis A, B, and E

vaccines with particular emphasis on universal childhood hepatitis B immunization; (2) prevention of mother-to-child transmission of hepatitis B through timely birth-dose vaccination, antenatal screening for chronic infection, and antiviral prophylaxis for eligible pregnant women; (3) injection, blood, and surgical safety, aimed at eliminating health care-associated transmission of hepatitis B and C; (4) harm-reduction services for people who inject drugs, delivered as part of comprehensive bloodborne-infection prevention programs; and (5) testing and treatment, which leverages highly effective antiviral therapies to reduce hepatitis-related morbidity and mortality. Underpinning all five is a foundation of surveillance and strategic information, and of sustainable health financing and governance, without which service coverage cannot be tracked or sustained.

Progress toward these targets is monitored through a formal country validation pathway. Under WHO's Guidance for Country Validation of Viral Hepatitis Elimination and Path to Elimination, nations that demonstrate they have met interim service-coverage and impact benchmarks can apply for recognition at bronze, silver, or gold tier status on the path to elimination, or for full validation once elimination has been achieved. This structured pathway gives national programs a concrete, internationally comparable framework against which to benchmark progress, and it has already produced a landmark result: in October 2023, Egypt became the first country in the world to be awarded gold tier status for hepatitis C, having diagnosed 87% of people living with the infection and provided curative treatment to 93% of those diagnosed, figures that exceeded WHO's gold tier thresholds of 80% diagnosed and 70% treated.

2.3 Public Health Awareness Programs

Because chronic hepatitis is so frequently silent, awareness campaigns function as a precondition for the rest of the elimination strategy rather than as an optional adjunct to it. Public health communication around viral hepatitis operates at several distinct levels, each serving a different function in the overall elimination pathway.

Global observances. World Hepatitis Day, marked annually on 28 July, is the flagship international awareness event, coordinated by WHO alongside civil society partners such as the World Hepatitis Alliance and national patient groups. The date is used each year to mobilize political commitment, publicize country and regional progress reports, and press governments whose programs have fallen behind schedule back "on track" toward the 2030 targets. Editorial commentary accompanying the release of the WHO Global Hepatitis Report in successive years has consistently used the occasion to warn that, absent a marked acceleration in investment and political prioritization, current trends will fall short of the global goals even as individual country successes demonstrate what sustained commitment can achieve.

Community and risk-group targeted campaigns. Because HBV and HCV transmission is concentrated among specific populations, people who inject drugs, people living with HIV, health care workers, migrants from high-endemicity regions, incarcerated populations, and infants born to hepatitis B-positive mothers, many national programs run targeted outreach through harm-reduction sites, antenatal clinics, correctional facilities, and migrant health services, rather than relying solely on general-population messaging. This targeting reflects the same principle that has driven the WHO African Region's emphasis on birth-dose vaccination messaging aimed at antenatal care providers and

pregnant women, and the emphasis in many high-income settings on harm-reduction-embedded testing for people who inject drugs, a population that accounted for 44% of new hepatitis C infections globally in 2024.

Provider and health-system awareness. Because chronic hepatitis is so often diagnosed incidentally, or not diagnosed at all, campaigns increasingly target clinicians directly, aiming to normalize routine risk-based or birth-cohort testing and to integrate hepatitis screening into existing service platforms such as HIV testing programs, antenatal care, and blood donation services. WHO has highlighted the prequalification of combined triple diagnostic tests capable of simultaneously screening for HIV, hepatitis B, and syphilis as a concrete step toward this kind of service integration, reducing the marginal cost and logistical burden of adding hepatitis screening to platforms that already reach at-risk populations.

Reducing stigma. A substantial and growing body of peer-reviewed literature documents that stigma toward people living with hepatitis B or C constitutes a measurable and consistent barrier to testing uptake, and is associated with worse psychosocial outcomes among those already diagnosed, including impaired quality of life, low self-esteem, social isolation, and depressive symptoms. A 2025 systematic review synthesizing 81 studies on hepatitis-related stigma found that stigmatizing attitudes were associated with reduced testing behavior in the majority of studies examining that relationship, and that educational interventions and stigma-reducing media coverage showed measurable, if modest, benefit in shifting public attitudes. Separate qualitative work on hepatitis C has emphasized that the quality of the relationship between a patient and their health care worker, and the degree of trust it establishes, can meaningfully offset the deterrent effect of anticipated stigma on health-seeking behavior. Public messaging that emphasizes hepatitis as preventable and treatable, rather than as a marker of injection drug use or other stigmatized behavior, is therefore not merely a communications nicety but a load-bearing component of the diagnosis pathway.

2.4 Elimination Program Components

Vaccination. Universal infant hepatitis B vaccination, ideally accompanied by a timely birth dose administered within 24 hours of delivery, remains the single most effective long-term prevention tool available, since the likelihood of an infection becoming chronic falls sharply with the age at which it is acquired. Global coverage of the three-dose infant hepatitis B vaccine series reached an estimated 84% by the end of 2024, with the vaccine now included in the national schedules of 190 WHO Member States. Coverage of the timely birth dose lags substantially behind, however: global birth-dose coverage has been estimated at only around 42–46% in recent assessments, with especially pronounced gaps in the WHO African Region, where birth-dose coverage was just 17% in 2024 despite the region carrying 68% of the world's new hepatitis B infections. This gap between three-dose series coverage and timely birth-dose coverage is widely identified in the literature as the single most consequential unmet target standing between current trends and the WHO's 2030 vaccination goals.

Blood and injection safety. Universal, quality-assured screening of blood donations, together with safe injection and surgical practices, is intended to eliminate health care-associated transmission of hepatitis B and C. Implementation remains uneven, particularly in lower-resource settings, and is repeatedly flagged in WHO and Commission reporting as an area requiring stronger investment; Egypt's own hepatitis C epidemic, notably, originated in unsafe injection

practices used during a mid-twentieth-century campaign against schistosomiasis, a history that its national elimination program explicitly addressed through the parallel scale-up of injection- and blood-safety measures alongside diagnosis and treatment.

Testing and diagnosis. Simplified, decentralized, and increasingly point-of-care testing algorithms have been promoted specifically to close the diagnosis gap, since the majority of people living with chronic hepatitis B or C remain unaware of their infection; WHO's 2024 hepatitis C fact sheet noted that roughly four in five people living with hepatitis C globally do not know they are infected. Combination diagnostics that test simultaneously for HIV, hepatitis B, and syphilis, along with the decentralization of testing to primary care and community settings, are intended to reduce the number of missed opportunities for diagnosis.

Treatment access. The introduction of direct-acting antivirals (DAAs) for hepatitis C, which achieve cure in more than 95% of cases over an 8–12 week course, and of effective long-term antiviral suppression for hepatitis B, transformed the treatment landscape after 2015 and is credited as the primary driver of the estimated 20% decline in the number of people living with chronic hepatitis C infection between 2015 and 2024. Falling drug prices and the availability of locally manufactured generic DAAs, most prominently in Egypt's national program, have substantially improved affordability, with treatment courses costing as little as 60 US dollars in some settings; nonetheless, meaningful access gaps persist across many low- and middle-income countries, and global HCV treatment coverage remains far below the 80% target, with recent country-level assessments finding coverage as low as 43% even in some high-income settings.

Surveillance and country validation. WHO's interim and final guidance for country validation provides national programs with a structured framework and a defined set of indicators against which to benchmark progress and, where warranted, to seek formal bronze, silver, or gold tier recognition or full elimination certification. This framework functions simultaneously as a monitoring tool and as an incentive structure, giving governments a concrete, internationally visible milestone to work toward.

2.5 Country and Regional Examples

Egypt. Egypt's national hepatitis C program is widely cited as the clearest existing proof of concept for what sustained political commitment, affordable diagnostics, and locally manufactured curative therapy can achieve. Following the launch of a nationwide campaign, widely known domestically as "100 Million Seha," that offered free testing and treatment beginning after 2014, Egypt screened more than 60 million people and treated more than four million, reducing new hepatitis C infections by an estimated 97% within roughly eight years. In October 2023, WHO formally certified Egypt as the first country in the world to achieve gold tier status on the path to hepatitis C elimination, and in 2025 WHO separately recognized Egypt as the first country in the Eastern Mediterranean Region to reach the regional hepatitis B control target. Egypt subsequently launched a Hepatitis Elimination Sustainability Plan focused on long-term financing, integration of hepatitis services within its Universal Health Insurance system, and continued strengthening of prevention, surveillance, and governance mechanisms, reflecting an explicit recognition that reaching elimination thresholds must be followed by sustained investment to maintain them.

Other national and regional programs. WHO and partner organizations have documented parallel, if generally less advanced, elimination efforts elsewhere, including national hepatitis programs across Central Asia and coordinated regional calls to action within the European Union and European Economic Area urging member states to accelerate service scale-up, with particular emphasis on harm-reduction access for people who inject drugs. The Lancet Gastroenterology & Hepatology Commission's 2024 update, which convened national experts from each of the twenty highest-burdened countries, found that policy progress toward elimination had been made in fourteen of the twenty highest-burden countries since 2018, with the most substantial gains observed in Bangladesh, India, Indonesia, Japan, and the Russian Federation, even as the Commission cautioned that progress across this group as a whole remained highly uneven.

2.6 Progress and Persistent Challenges

Despite nearly a decade of strategy development since the original 2016 World Health Assembly resolution, WHO and independent analyses converge on the assessment that global progress remains "too slow and uneven," in the words of WHO Director-General Tedros Adhanom Ghebreyesus. A 2025 analysis presented at the American Association for the Study of Liver Diseases' Liver Meeting found that only 15% and 14% of countries, respectively, were on track to meet the 2030 targets for hepatitis C mortality and incidence, with substantial regional disparities separating high-performing countries such as Egypt and Norway from the majority still lagging on core coverage indicators. Several structural barriers recur throughout the literature and WHO reporting:

Financing gaps. Domestic and international investment in testing, treatment, and prevention infrastructure remains inadequate relative to the scale of the epidemic, particularly outside the small number of countries that have made hepatitis a discrete national political priority.

Low birth-dose vaccination coverage. With global timely birth-dose coverage still well below the 90% target and as low as 17% in the highest-burden WHO region, a persistent stream of new perinatal infections continues even as three-dose series coverage approaches acceptable levels.

Underdeveloped blood and injection safety systems. Unsafe injection and transfusion practices remain a documented driver of transmission in a number of countries, a legacy risk that Egypt's own epidemic illustrates starkly.

Diagnostic and treatment access gaps. Roughly four in five people with hepatitis C, and a comparable share of those with hepatitis B, remain undiagnosed globally, with the gap most pronounced in low-resource settings and among marginalized populations, including people who inject drugs, incarcerated populations, and migrants.

Stigma. Peer-reviewed evidence consistently links hepatitis-related stigma, both anticipated and enacted, to reduced testing uptake and worse psychosocial outcomes, and identifies a continuing shortage of validated, standardized tools for measuring and addressing it across different cultural and health-system contexts.

Weak health information systems. Limited surveillance and reporting capacity in many countries constrains the ability of both national programs and WHO's global monitoring apparatus to track progress reliably and to identify where course correction is most urgently needed.

Political prioritization. Viral hepatitis continues to compete for attention and funding against other public health priorities, including HIV and tuberculosis, despite killing a comparable or greater number of people annually.

2.7 Recommendations for Accelerating Progress

Drawing on the evidence reviewed above, several priority actions emerge consistently across WHO reporting, Commission analyses, and the peer-reviewed literature on hepatitis programs and awareness campaigns. First, hepatitis testing should be more systematically integrated into existing service platforms, including HIV clinics, antenatal care, and harm-reduction programs, to reduce marginal cost and expand reach without requiring entirely parallel infrastructure. Second, timely birth-dose hepatitis B vaccination should be prioritized as a discrete, trackable national indicator distinct from three-dose series completion, given the disproportionate contribution of perinatal transmission to chronic infection risk. Third, access to low-cost generic direct-acting antivirals and simplified hepatitis B treatment protocols should be expanded, following the pricing and manufacturing models demonstrated in Egypt and other gold-tier and near-gold-tier countries. Fourth, national surveillance and reporting systems require sustained investment to support the WHO country validation process and to allow course correction where progress lags. Fifth, awareness campaigns should continue to be risk-group specific rather than purely general-population in orientation, paired explicitly with stigma-reduction messaging grounded in the growing evidence base on what measurably shifts testing behavior. Finally, and perhaps most fundamentally, sustained domestic financing and political commitment are needed to treat hepatitis elimination as an achievable, time-bound public health goal rather than an aspirational one, following the explicit example set by Egypt's national leadership.

3. Conclusion

The global commitment to eliminate viral hepatitis as a public health threat by 2030 is scientifically and programmatically achievable: effective vaccines, curative therapies, simplified diagnostics, and a validated country certification pathway all already exist and have been demonstrated at national scale in Egypt and, to varying degrees, in a growing number of other countries. What remains insufficient is the pace and equity of implementation. Global data through 2024 show real, measurable gains, a 32% decline in new hepatitis B infections and a 12% decline in hepatitis C-related deaths since 2015, alongside persistently low birth-dose vaccination coverage, a diagnosis gap that leaves the majority of infected people unaware of their status, and stigma that continues to suppress testing uptake even where services are available. Closing the diagnosis and treatment gap, improving timely birth-dose vaccination coverage, and sustaining well-targeted, stigma-reducing public awareness efforts represent the most immediately actionable levers available to national programs and global partners alike. Without a marked acceleration in financing, surveillance capacity, and political will over the years remaining to 2030, current trends suggest that the global targets, as WHO itself has repeatedly acknowledged, will be missed, even as individual country successes continue to demonstrate exactly what is possible when commitment, affordable tools, and sustained public communication are combined.

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