



Achieving Viral Hepatitis Elimination Through Vaccination and Treatment

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DESCRIPTION

Viral hepatitis is a significant global public health challenge caused primarily by hepatitis A, B, C, D and E viruses. Among these, hepatitis B and C viruses are responsible for the majority of chronic liver disease, cirrhosis and hepatocellular carcinoma worldwide. The World Health Organization has set ambitious targets to eliminate viral hepatitis as a public health threat by 2030, aiming to reduce new infections by 90 percent and mortality by 65 percent. Achieving this goal requires a comprehensive approach that includes vaccination, early diagnosis, access to antiviral therapy, public health education and robust healthcare infrastructure. Understanding the epidemiology, transmission dynamics and interventions available is essential to guide effective elimination strategies.

Hepatitis B virus is primarily transmitted through perinatal exposure, unsafe injections and sexual contact, while hepatitis C virus spreads mainly through exposure to contaminated blood. Both infections can persist silently for decades, leading to progressive liver damage and late recognition of complications. Effective vaccines are available for hepatitis B and hepatitis A and antiviral therapies can cure hepatitis C, making elimination feasible. However, gaps in diagnosis, treatment access and prevention coverage continue to hinder global elimination efforts. Regions with high prevalence, such as parts of Asia and sub-Saharan Africa, face particular challenges in reducing disease burden due to limited healthcare resources and insufficient public awareness.

Vaccination is the cornerstone of viral hepatitis prevention. The hepatitis B vaccine, introduced into national immunization programs worldwide, has dramatically reduced the incidence of new infections in children. Timely birth dose administration is critical to prevent mother to child

transmission, which is a major route of chronic hepatitis B infection. Vaccination against hepatitis A is effective in preventing outbreaks in high risk populations and areas with poor sanitation. Expanding vaccine coverage remains a priority for public health authorities and is a fundamental step toward elimination.

Screening and early diagnosis are important components of hepatitis elimination strategies. Many individuals with chronic hepatitis B or C remain asymptomatic until advanced liver disease develops, emphasizing the importance of proactive testing. Targeted screening programs for high risk populations, such as people who inject drugs, healthcare workers and pregnant women, can identify infections early and link patients to care. Advances in diagnostic technologies, including rapid tests and point of care assays, have improved accessibility and accuracy, allowing for timely initiation of therapy.

Treatment interventions are essential to reduce morbidity, mortality and transmission. For hepatitis B, antiviral therapy can suppress viral replication, slow disease progression and prevent complications. Although treatment is not curative, long term therapy effectively controls infection and reduces liver cancer risk. Hepatitis C can now be cured in most patients using direct acting antiviral agents, which are highly effective and well tolerated. Widespread access to these treatments has the potential to significantly reduce disease burden, particularly in regions with high prevalence. Scaling up treatment programs requires addressing barriers such as cost, healthcare infrastructure and patient awareness.

Global coordination and strong healthcare systems are vital for achieving elimination targets. Surveillance systems that monitor infection rates, vaccination coverage and treatment

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outcomes are necessary to guide policy decisions and assess progress. International collaborations, funding mechanisms and political commitment have already resulted in successful national elimination programs in several countries. Nevertheless, continued investment and innovation are required to overcome challenges related to resource limitations, inequitable access to care and social determinants of health.

Research and technological innovation play a key role in accelerating elimination efforts. Advances in vaccine development, antiviral therapy, diagnostic methods and digital health interventions improve the reach and effectiveness of programs. Novel strategies, such as point of care testing, simplified treatment protocols and telemedicine, allow healthcare services to reach underserved populations

and enhance adherence. Ongoing studies also explore combination prevention strategies and public health modelling to optimize resource allocation and maximize impact.

In conclusion, viral hepatitis elimination is an achievable but complex global health objective that requires a multifaceted approach. Prevention through vaccination, early diagnosis, widespread access to antiviral therapy, public education and strong health systems are essential components of successful strategies. Progress toward elimination has been made, yet significant challenges remain, particularly in high prevalence regions with limited resources. Sustained political commitment, international collaboration and continued research are necessary to overcome barriers and realize the vision of a world free from the burden of viral hepatitis.