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Editorial

Towards Elimination of Chronic Hepatitis B: How Close are We?

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The quest to eradicate the Hepatitis B virus (HBV) as a public-health threat has evolved from hopeful aspiration to a measurable global programme. Over the past four decades, we have moved from the discovery of the virus and its first plasma-derived vaccines to sophisticated recombinant vaccines, potent oral antivirals, and an increasingly loud call for a sterilizing or functional cure. Yet elimination was never conceived as a purely biomedical exercise; it is an exercise in health-systems equity. Now, between the 2016 launch of the first WHO Global Health Sector Strategy on viral hepatitis and its 2030 deadline,1 it is timely to ask how close the world is to defeating this tenacious pathogen.

Elimination, as defined by the World Health Organization, is not zero infection but a 90% reduction in incidence and a 65% reduction in HBV-related mortality compared with a 2015 baseline. The operational proxy for those mortality and incidence cuts is a cascade of numerical targets: 90% of infants receiving a timely birth dose, 90% completing the three-dose infant schedule, 90% of people with chronic HBV diagnosed, and 80% of those eligible, receiving sustained antiviral therapy. The logic is simple: interrupt vertical transmission at birth, immunize early childhood cohorts, diagnose the hidden reservoir of adult infection, and treat those at risk of progressive liver disease. In practice, each rung of that cascade rests on different combinations of political will, finance, supply chains, and community trust.

In 2022, WHO estimated that 254 million people were living with hepatitis B worldwide, with 1.1 million hepatitis B-related deaths and 1.2 million new hepatitis B virus (HBV) infections.2 Three-fourths of countries and territories profiled have achieved the 2025 WHO interim target of less than 0.5% HBsAg prevalence in children under five. Two-thirds have implemented universal newborn hepatitis B vaccination policies. Only 7 countries/territories have met the 60% diagnosis target. Most countries reaching the diagnosis goal are high-income. No country has achieved the treatment target of 80% of persons with hepatitis B receiving treatment.

Yet the raw global averages obscure stubborn geographic inequity. Coverage of the hepatitis B birth dose in the African region must be scaled up to meet elimination goals. 3 For example, in sub-Saharan Africa, the region that carries roughly one-quarter of the planet's HBV burden, timely birth-dose coverage lags at an estimated 17 %4; similar shortfalls persist in parts of South-East Asia and the western Pacific. The consequences are immediate: every missed birth dose risks chronic infection in 90 % of exposed neonates,'5 perpetuating the cycle of liver cirrhosis and hepatocellular carcinoma that already claims more than half a million African lives annually. Those disparities reflect gaps in facility-based deliveries, cold-chain reliability, and the training and remuneration of front-line maternity workers-issues whose solutions lie more in obstetric infrastructure than in virology.

If vaccination progress fuels optimism, the diagnosis and treatment cascade provoke sober reflection. Despite the availability of highly sensitive rapid tests and WHO-prequalified, low-cost nucleic-acid assays, only about one person in ten living with chronic HBV worldwide is aware of their infection, and a mere 16.7% are on antiviral therapy.—6 The reasons for this are manifold: HBV is asymptomatic for decades; testing competes with other urgent health priorities; antiviral programmes require long-term budget lines that many ministries of health do not control; and the stigma attached to a virus linked, in

popular imagination, to "immoral" behavior still drives people away from screening sites.

Mother-to-child prevention illustrates the fragile interface between technology and system capacity. Tenofovir prophylaxis in late pregnancy, added to passive-active immunization of the newborn, can slash vertical transmission to below 1%.7 Yet national antenatal HBV screening remains patchy, and many low-income settings lack the viral-load testing needed to triage prophylaxis. Where data exist, fewer than one in two pregnant women in several high-burden African and Asian countries receive an HBsAg test; among those who test positive, even fewer obtain viral-load-guided therapy. The resulting trickle of new chronic infections into each birth cohort is small relative to historical levels but large enough to derail the 2030 timeline.

Adult vaccination, too, reveals unfinished business. Health-care workers, people who inject drugs, sex workers, and individuals in custodial settings carry disproportionate HBV risk, yet adult-dose uptake in those populations is inconsistent. Some high-income countries have moved to universal adolescent catch-up programmes or funded "test-and-vaccinate" drives in prisons; elsewhere, vaccine purchase remains limited to paediatric schedules. Without a concerted push, a reservoir of susceptible adults will persist long after paediatric cohorts are protected.8

Financial commitment has proven to be the hidden variable throughout the cascade. Unlike HIV and tuberculosis, HBV elimination enjoys no dedicated multibillion-dollar global fund. Gavi co-finances infant vaccines in eligible countries, but diagnostic and treatment scale-up is largely dependent on domestic budgets that compete with emergencies and economic downturns. Where governments have pooled procurement and negotiated generic tenofovir prices below US$5 per month, treatment accelerates; where not, out-of-pocket costs still hover at prohibitive levels. Stigma saps political momentum further: the silent nature of HBV infection means affected communities rarely mobilize with the urgency witnessed in HIV activism.

Science offers tantalizing glimmers of a cure. Novel therapeutics targeting viral entry (bulevirtide), capsid assembly, RNA interference, and immune modulation are in phase II and III trials, and ex-vivo CRISPR-Cas gene-editing studies have already shown near-complete eradication of covalently closed circular DNA in hepatocyte models. 9 Scientific breakthroughs alone however, cannot breach the diagnostic gap: a curative regimen helps few if the infected majority remain undiagnosed.

National experience underscores the tension between policy vision and implementation. Pakistan, for instance, has integrated the HBV birth dose into its Expanded Programme on Immunization (EPI), yet only two in ten newborns receive it on time; fewer than one in ten people with chronic HBV are diagnosed, and well under five percent receive antivirals. There is a decrease in the prevalence of hepatitis B in surveys conducted in Punjab and Sindh in 201810 from 2.4% (2007-8) to 2.2% (2018-19) and in Sindh from 2.5% to 1.1%. There were 10,620 HBV-related deaths in 2022 and a mortality rate of 4.21 per 100,000 people year.11 This may be related to the implementation of vaccination programs. The country's hepatitis control framework exists on paper, but underfunding, fragmented provincial governance, and prevalent unsafe injection practices keep the elimination horizon well beyond 2030.12,13 The Pakistani example illustrates a broader truth: technical guidance without resources and accountability does little to bend national trajectories.

The road to 2030, then, is neither a sprint nor a gentle glide but a steep climb whose gradient increases the closer we get to the summit. The ascendant slope comprises universal birth-dose adoption in Africa and parts of Asia; mass decentralised testing using point-of-care HBsAg and confirmatory nucleic-acid platforms; task-shifted antiviral initiation in primary-care clinics; and, critically, the political courage to earmark sustained financing that competitors for treasury dollars will contest. None of these steps requires waiting for a cure. All require integrating HBV services into maternal and child health, HIV platforms, and community drug-harm reduction programmes in ways that normalize hepatitis prevention as basic health care.

In conclusion, the elimination of hepatitis B is biologically feasible and, in pockets of the globe, procedurally within view, but the world is not yet on a trajectory to meet the 2030 global targets. Vaccination successes confirm that prevention works when delivered equitably, yet the vast undiagnosed reservoir, the meagre treatment coverage, and the underfunded public-health infrastructure in high-burden countries threaten to turn elimination from deadline to a deferred dream. To prevent that slide, the next five years must witness an unprecedented surge in testing, a levelling of birth-dose inequities, and political commitments. The journey is well underway; how close we are, depends less on new technology and more on the collective will to finish the course.

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