The burden of chronic hepatitis B and C in 2022 and progress towards elimination: a global report

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Summary

Background WHO has worked closely with member states to set baseline targets, monitor progress and gaps, and develop a strategy to achieve the elimination of viral hepatitis as a public health threat by 2030. This analysis aimed to use the latest data to assess global progress, identify gaps, and provide strategic support to countries and regions to scale up prevention and treatment services to meet global, regional, and country-level targets.

Methods Data on key indicators for 2022 were collated in 2023, including prevalence, incidence, mortality, and the cascade of care for chronic hepatitis B virus (HBV) and chronic hepatitis C virus (HCV) infections. WHO country offices, regional offices, related departments, and partners were involved to verify and ensure the quality and completeness of the data. Data from 2022 were compared with historical data to monitor progress, and reported data were compared with expected data and targets to identify gaps in incidence and mortality.

Findings As of June 30, 2023, WHO had received verified data reports from 187 of 194 countries and territories, including data contributions from collaborative partners. We estimated that, in 2022, globally, 254 million (3·27%) of 7758 million people were living with chronic HBV infection and 50 million (0·65%) people were living with HCV infection. Overall, five countries (China [83·7 million; 27·5%], India [35·3 million; 11·6%], Indonesia [18·9 million; 6·2%], Nigeria [15·7 million; 5·2%], and Pakistan [12·6 million; 4·2%]) accounted for 55% of the combined global burden of HBV and HCV. There were more than 2·2 million (95% CI 1·8–2·7) new chronic HBV and HCV infections and more than 1·3 million (95% CI 1·1–1·6) deaths due to HBV and HCV in 2022, with the majority of deaths due to HBV (1·1 million [95% CI 0·98–1·24]); as a result, the point estimate for deaths due to hepatitis in 2022 exceeded that of deaths due to tuberculosis in 2023 (1·25 million [95% UI 1·13–1·37]). There were 1·2 million new chronic HBV infections worldwide in 2022; 62·7% (771 000) of these new infections occurred in the African Region. In 2022, 34·1 million (95% CI 30·2–38·5) individuals living with HBV were diagnosed; of these, 6·6 million (95% CI 5·9–7·5) received antiviral treatment. In 2022, 25·7 million (95% CI 19·5–28·8) individuals were diagnosed with HCV infection and 12·5 million (95% CI 9·5–14·0) were treated with direct-acting antiviral drugs in 2015–22.

Interpretation Viral hepatitis represents a substantial burden of infectious disease globally, comparable with that caused by tuberculosis. Progress towards global hepatitis elimination is currently insufficient to meet the 2030 targets defined in the UN Sustainable Development Goals; efforts need to be rapidly and urgently scaled up across all regions. In particular, given the rising mortality due to hepatitis B globally, expansion of hepatitis B vaccination is a priority, particularly in the African Region, where the majority of new chronic HBV infections occur. Access to prevention, diagnosis, and treatment services needs to be scaled up substantially by the end of 2026 to meet the 2030 global hepatitis elimination targets.

Funding World Health Organization.

Lancet Gastroenterol Hepatol 2026

Published Online March 24, 2026 https://doi.org/10.1016/S2468-1253(25)00375-9

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Introduction

Two resolutions adopted by the World Health Assembly (WHA) in 2010[1] and 2014[2] recognised that viral hepatitis represented a major global public health problem and resolved to tackle the burden of disease associated with it. The WHA subsequently endorsed the Global Health Sector Strategy (GHSS 2016–21) on viral hepatitis in May, 2016, aiming to eliminate viral hepatitis as a public health threat by 2030. Thereafter, WHO developed key indicators to track progress towards the elimination of viral hepatitis and published global reports on progress in 2017[3] and 2021.[4] The GHSS for HIV, viral hepatitis,

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Research in context

Evidence before this study

Since the 69th World Health Assembly endorsed the Global Health Sector Strategies on viral hepatitis (2016–21) in 2016 and set the goal to eliminate viral hepatitis as a public threat by 2030, WHO has developed technical guidelines for testing and treatment, produced operational models, established a global reporting system to track progress, and published a framework to validate hepatitis elimination at a country level. In collaboration with member states and WHO regional offices, WHO published the global hepatitis report in 2017, 2021, and 2024; respectively, these reports provide the baseline, progress, and up-to-date data for policy development and summarise actions taken. Given the crucial need for strategic information for action, WHO intensified its technical support for member states to establish their systems for data collection and track progress towards elimination targets. In 2017, only 42 countries reported strategic information to the global reporting system, which increased to 130 countries in 2021.

Added value of this study

The 2022 global hepatitis estimates provide the most up-to-date evidence for evaluating progress, identify data and programme gaps, and explore solutions for reaching the 2030 elimination targets. Verified data were reported from 187 countries, providing actionable and comparable evidence on a national, regional, and global level and over time. In 2022, an estimated 3·27% (254·0 million [95% CI 225·0–286·6] of 7758 million) of the global population was living with chronic HBV infection and 0·65% (50·0 million [95% CI 37·9–65·8]) was living with chronic HCV infection; there were 1·2 million (95% CI 1·1–1·4) new chronic HBV infections and 1·0 million (0·8–1·3) new chronic HCV infections, and 1·1 million (95% CI 0·98–1·24) died as a result of HBV and 240 000 (187 000–325 000) from HCV. Among individuals living with hepatitis B, 34·1 million (13·4%) knew their status, of whom 6·65 million (19·5%) received treatment. Among people with HCV infection, 25·7 million (36·4% of the number estimated to be living with HCV in 2015) were diagnosed in 2022, and 12·5 million (48%) were treated with direct-acting antiviral drugs in 2015–22. In 2022, 95 countries met the 2025 goal of elimination of mother-to-child hepatitis B virus (HBV) transmission of 0·5% or lower (HBsAg prevalence in children ≤5 years), 47 countries met the 2030 goal of elimination of mother-to-child HBV transmission of 0·1% or lower (HBsAg prevalence in children ≤5 years), 90 countries met the 2025 hepatitis C incidence goal (annual incidence of hepatitis C virus [HCV] ≤13 per 100 000), 29 countries met the 2030 hepatitis C incidence goal (annual HCV incidence ≤five per 100 000), 62 countries met the 2025 mortality target (combined HBV and HCV; ten per 100 000), and 30 countries met the 2030 mortality target (combined HBV and HCV; six per 100 000). Five countries (China, India, Indonesia, Nigeria, and Pakistan) accounted for 55% of the global burden of hepatitis, making them a crucial focus for scale-up by the end of 2026 to achieve global 2030 elimination targets.

Implications of all the available evidence

In 2022, mortality due to viral hepatitis exceeded that of tuberculosis. Viral hepatitis is not only a leading infectious disease killer but also results in cancers and a high non-communicable disease burden. Globally, only 2·6% of HBV infections (2022 baseline) and 20·0% of HCV infections (2017 baseline) were treated in 2022, highlighting the urgent need to scale up testing and treatment, particularly in regions with a high disease burden. Timely birth dose coverage of the hepatitis B vaccine also remains suboptimal across many countries, especially in the African Region, which bears the majority of new HBV infections. Given the availability of effective interventions to prevent and treat hepatitis, it is crucial to intensify and accelerate efforts to ensure the 2030 global elimination targets can be met.

and sexually transmitted infections (STIs) was updated in 2022 to leverage integrated strategies within the framework of universal health coverage for the period 2022–30.[5] Additionally, WHO developed the viral hepatitis elimination validation framework in 2023[6] and also updated global guidance and criteria on the triple elimination of mother-to-child transmission of HIV, hepatitis B, and syphilis.[7]

To reach elimination targets, the updated GHSS presents five strategic directions (people-centred services, systems-oriented approaches, data-based decisions, empowered communities, and innovations) to facilitate monitoring of progress on priority indicators of disease burden and interventions to scale up towards universal access. These strategic efforts require data on five areas: prevention coverage, including prevention of mother-to-child transmission of hepatitis B; harm reduction for people who inject drugs; blood and injection safety; testing and diagnosis; and treatment.[8] In 2022, WHO received officially verified data from 130 countries and used data from partners for the remaining 70 countries and territories as a baseline for its strategy for 2022–30. It was estimated that hepatitis B and C caused more than 3 million new infections globally; 10% of people with hepatitis B virus (HBV) infection knew their status, and 22% of people diagnosed with hepatitis B received treatment; among people with hepatitis C virus (HCV) infection, 21% knew their status; and 13% of people who were diagnosed with hepatitis C infection were treated with direct-acting antiviral drugs between 2015 and 2019.[9]

Despite the existence of effective treatment and prevention interventions, the incidence of—and mortality due to—viral hepatitis remains high, with many countries far from meeting the global elimination target by 2030.[10,11] The current report analyses, for the first time, publicly available data on hepatitis prevention, diagnosis, and

For the **publicly available data** see https://www.who.int/data/gho/data/indicators/indicator-details/GHO/hepatitis---number-of-chronic-hepatitis-b-infected-persons-treated

treatment from 187 countries; data reported here informed the 2024 WHO global report on progress.[10] This is the first time WHO has released verified data for member states individually, as well as data on global policy implementation and the strategy for achieving the 2030 hepatitis elimination target (appendix p 1).

Methods

Global, regional, and country-level reporting

In early 2023, WHO renewed and simplified global hepatitis reporting, focusing on ten key indicators (appendix pp 2–8), simplified the stages for country-level reporting, and defined consistent measures and indicators to monitor progress towards targets. WHO headquarters, as well as regional and country offices, collaborated regularly to support and verify the data provided by country offices, by meeting with national focal points from the ministries of health of the respective member states from February to December, 2023. To ensure the completeness, accuracy, and quality of the data, WHO headquarters worked closely with regional offices, provided hands-on training and tutorial guidance for all countries in each WHO region, explained the definitions of the indicators and the procedure for reporting, and discussed potential validation issues and solutions.

WHO also established a reference group of experts and partners to verify the data, which consisted of the relevant departments in WHO, the Center for Disease Analysis Foundation (CDAF), Institute for Health Metrics and Evaluation (IHME; which is responsible for the Global Burden of Diseases, Injuries, and Risk Factors Study [GBD] research), Imperial College London, the University of Bristol, and the International Agency for Research on Cancer (IARC). The reference group was tasked with objectively evaluating and verifying data and providing additional sources to countries. The CDAF also collaborated closely with WHO on supporting regional offices and visiting individual high-burden countries for data triangulation and responding to validation questions.

The number of indicators and forms for assessing progress on the GHSS, including the burden of infection, incidence, mortality, and the cascade of care, were substantially simplified for 2022, which improved the response rate in countries.[10] Viral hepatitis prevention and transmission by specific risk groups were not included in this analysis.

Countries were asked to return their reports to WHO through an online reporting tool between April and July, 2023, after which WHO worked with national focal points and partners to verify and finalise estimates. Data were then finalised in September, 2023, with further verification in individual countries continuing up to the end of 2023.

Data collection and verification

WHO regional offices worked with national stakeholders and supported member states to collect updated data and provided technical support as necessary. WHO headquarters developed a template form for member states (the global reporting system for viral hepatitis); the form included key indicators, the definition and description of each indicator, years when data were needed and suggested sources (eg, country data, partner data, or regionally collected data such as through the European Centre for Disease Prevention and Control). Meanwhile, data collection tools were developed and translated into multiple languages for efficiency. Additionally, information webinars on data reporting were delivered in multiple languages. WHO communicated with regional offices and asked focal points and strategic information officers on hepatitis in each region for input on the accuracy of indicator definition, period of data collection, and procedures of reporting. WHO monitored progress on global reporting and communicated with the regional offices to assess completeness of data.

See Online for appendix

WHO headquarters and the reference group reviewed the country-verified data and compared the data with partner data based on the principles of sources, time period, representativeness, completeness, and reliability. The data verification process gave primacy to data reported from country-level sources, either from surveillance or disease registration systems.

WHO shared preliminary results with regional offices and initiated the verification process, and the regional offices coordinated the verification process for their member states; during this step, countries were given a clear timeline and procedure for verification and were asked to prepare the data for review. Focus was given to priority countries and regions with a high disease burden (38 countries [representing 80% of the global hepatitis burden] and the African region; appendix pp 9–10), and meetings with these countries for data triangulation were scheduled as requested.

During the verification process, countries were asked to provide data, which were then reviewed by WHO regional and headquarters teams. Any questions related to data availability, sources, time period, methodology, completeness, or quality issues were relayed back to the countries. The final decision on the data was made after verification: to accept the data if they met the requirements, update the data if there were gaps that needed improvements, or deny the data if there was a major concern.

The reference group and regional offices communicated with country offices in an iterative manner to verify and finalise the data. Country-verified data were prioritised over modelled estimates for the development of the cascade of care and disease burden estimates. Countries were also given the option to use any of the available partner data if there were major gaps in national data. For countries without empirical data, partner data were provided to the focal points for reference and country verification. These countries then decided which partner

data (eg, CDAF, IHME, or others) most closely represented their likely burden.[12–14] Data from WHO regional offices, verified before this study, took priority when estimating regional and global estimates, both for the point estimate and the 95% CIs, following the same verification procedures.

Statistical analysis

We made two verification adjustments by comparing national reports with private sector drug consumption data and adjusting population surveys by age group to age-standardise the data; these adjustments were provided back to the country for review; the national focal point reviewed the pre-validated data and, based on the country's situation, approved the use of the estimated data, modified the data, or provided updated new data. The number of people living with HBV was defined as those currently with chronic HBV infection, including newly diagnosed individuals, but excluding those who had died or recovered naturally. The number of individuals with HCV infection was estimated by adding the number of new infections from 2015 and subtracting the number of individuals who had died or were cured. Diagnosis and treatment coverage for HBV were calculated on the basis of the accumulated number of people diagnosed or treated between 2015 to the end of 2022 versus those with current infection, while HCV coverage was calculated on the basis of the cumulative number of people initiating HCV treatment between 2015 and 2022 versus those with chronic HCV infection at baseline in 2015.[3] We calculated 95% CIs using the mean and SD for each country's point estimates; the aggregated minimum and maximum values of all country-level estimates were summed at the regional and global levels. Additionally, we permitted variance in regional estimates of up to 20% for indicators for which ranges had not previously been reported. The detailed methodology describing the point estimates and uncertainty calculations has been published previously.[9] We compared the new data with historical data published by WHO since 2016 to monitor progress and compared actual reported data with expected data and targets to identify gaps in incidence and mortality. To assess progress against elimination targets, we constructed annual expected trajectories for incidence and mortality from 2015 to 2030 using actual data reported from 2015 to 2019, and the WHO milestone and end-point targets for 2020, 2025, and 2030. For each indicator, we estimated the expected annual value by linear interpolation between successive anchor years, assuming a constant change within each interval. We applied the same approach to the lower and upper bounds of the uncertainty intervals to generate annual expected 95% CIs. We then compared the observed 2022 point estimate and 95% CI with the corresponding expected 2022 value and interval on the target trajectory; deviation from target was defined as the difference between observed and expected values in 2022. Vaccination coverage data were derived from WHO Joint Reporting Form estimation. All data analyses were conducted in R (version 4.2.3) and Microsoft Excel (Microsoft Office 2024).

Role of the funding source

This study was fully funded by WHO. WHO staff contributed to data collection, data analysis, data interpretation, and writing of the report.

Results

As of June 30, 2023, WHO had received verified data reports from 187 of 194 member states, with data contributions and verification from collaborative partners. Countries that provided verified data were included directly in the global and regional datasets, estimates were produced globally and by WHO region; country-specific data are provided in the appendix (pp 11–17).

Based on prevalence data from WHO and estimates from collaborative partners, an estimated 3·27% of the global population (254·0 million [95% CI 225·0–286·6] of 7758 million individuals) was living with chronic HBV infection and 0·65% of the global population (50·0 million [95% CI 37·9–65·8]) was living with chronic HCV infection in 2022. Table 1 shows the

	2015*		2019†		2022	
	Prevalence of HBsAg among general population	Prevalence of HCV infection among general population	Prevalence of HBsAg among general population	Prevalence of HCV infection among general population	Prevalence of HBsAg among general population	Prevalence of HCV infection among general population
African Region	6·10% (4·60–8·50)	1·00% (0·70–1·60)	7·53% (5·68–10·49)	0·84% (0·55–1·35)	5·77% (4·46–7·23)	0·70% (0·36–1·41)
Region of the Americas	0·70% (0·40–1·60)	0·70% (0·60–0·80)	0·53% (0·30–1·21)	0·47% (0·40–0·54)	0·49% (0·22–1·15)	0·51% (0·21–1·14)
South-East Asia Region	2·00% (1·50–4·00)	0·50% (0·40–0·90)	3·02% (2·27–6·04)	0·50% (0·40–0·94)	3·04% (2·36–3·86)	0·45% (0·37–0·55)
European Region	1·60% (1·20–2·60)	1·50% (1·20–1·50)	1·46% (1·09–2·37)	1·34% (1·07–1·48)	1·17% (0·69–2·18)	0·91% (0·50–1·82)
Eastern Mediterranean Region	3·30% (2·60–4·30)	2·30% (1·90–2·40)	2·54% (2·00–3·31)	1·64% (1·36–1·81)	2·08% (1·25–3·37)	1·75% (1·14–3·31)
Western Pacific Region	6·20% (5·10–7·60)	0·70% (0·60–0·80)	5·92% (4·87–7·26)	0·49% (0·42–0·70)	4·99% (4·12–6·06)	0·36% (0·17–0·74)
Global	3·50% (2·70–5·00)	1·00% (0·80–1·10)	3·84% (2·96–5·48)	0·75% (0·60–0·98)	3·27% (2·9–3·7)	0·65% (0·50–0·87)

Data are percentages (95% CI). HCV=hepatitis C virus. *Global hepatitis report 2017 (pp 12, 14).[3] †Global progress report on HIV, viral hepatitis and sexually transmitted infections, 2021 (pp 8–13).[4]

Table 1: **Global estimates of the burden of chronic hepatitis B and hepatitis C infections by WHO region, in 2015, 2019, and 2022**

estimated burden of chronic HBV and HCV infections globally and by region. 38 countries comprise nearly 80% of global viral hepatitis infections and deaths. Of these, ten countries—Bangladesh, China, Ethiopia, India, Indonesia, Nigeria, Pakistan, Philippines, Russia, and Viet Nam—accounted for nearly two thirds of the burden, and five of these ten countries (China [83·7 million; 27·5%], India [35·3 million; 11·6%], Indonesia [18·9 million; 6·2%], Nigeria [15·7 million; 5·2%], and Pakistan [12·6 million; 4·2%]) accounted for 55% of the combined global burden of HBV and HCV.

The African Region had the highest HBsAg prevalence in the general population (5·77% [95% CI 4·46–7·23]), followed by the Western Pacific Region (4·99% [4·12–6·06]), while the Region of the Americas had the lowest HBsAg prevalence (0·49% [0·22–1·15]; table 1). The Western Pacific Region (96·8 million [95% CI 79·9–117·7]), African Region (64·7 million [50·4–81·0]), and South-East Asia Region (61·4 million [47·6–78·0]) had the largest number of HBV infections due to their large population sizes and high prevalence of HBsAg. There were an estimated 5·0 million (95% CI 4·0–5·9) individuals living with chronic HBV in the Region of the Americas, 10·5 million (8·4–12·6) in the European region, and 15·1 million (12·1–18·0) in the Eastern Mediterranean region. The Region of the Americas, European Region, Eastern Mediterranean Region, and Western Pacific Region had declining trends of HBsAg prevalence from 2015 to 2022, whereas the African Region and South-East Asia Region consistently had a high HBsAg prevalence during the same period (table 1).

The Eastern Mediterranean Region had the highest HCV prevalence (1·75% [95% CI 1·14–3·31]), followed by the European Region (0·91% [0·50–1·82]), while the Region of the Americas (0·51% [95% CI 0·21–1·14], South-East Asia Region (0·45% [0·37–0·55]), and Western Pacific Region (0·36% [0·17–0·74]) had a lower HCV prevalence compared with other regions (table 1). The Eastern Mediterranean Region (11·7 million [95% CI 7·6–22·0]) and the South-East Asia Region (9·1 million [7·4–11·1]) had the largest number of HCV infections; an estimated 7·8 million (6·2–9·3) individuals were living with a chronic HCV infection in the African Region, as were 8·5 million (6·8–10·2) in the European Region, 5·2 million (4·1–6·2) in the Region of the Americas, and 7·0 million (5·6–8·4) in the Western Pacific Region. The African Region, European Region, and Western Pacific Region had declining trends of HCV prevalence from 2015 to 2022, with the Western Pacific Region consistently having the lowest prevalence, while the Eastern Mediterranean Region consistently had the highest HCV prevalence during the same period (table 1).

Table 2 provides estimates of new chronic infections and deaths globally and by region. HBV and HCV caused more than 2·2 million (95% CI 1·8–2·7) new chronic

	2015*			2019†				2022			
	Number of new hepatitis B infections	Number of new hepatitis C infections	Number of deaths caused by HBV‡	Number of deaths caused by HCV‡	Number of new hepatitis B infections	Number of new hepatitis C infections	Number of deaths caused by HBV	Number of deaths caused by HCV	Number of new hepatitis B infections	Number of new hepatitis C infections	Number of deaths caused by HBV	Number of deaths caused by HCV
African Region	..	309 (222–544)	136	136	990·7 (660·5–1 552·1)	211·9 (152·2–373·0)	80·4 (46·9–113·4)	45·2 (23·0–71·8)	771 (596–965)	172 (88–346)	272 (210–340)	35 (18–71)
Region of the Americas	..	63 (59–69)	..	..	10·2 (5·1–25·5)	67·0 (62·8–73·4)	14·6 (8·5–23·2)	31·4 (19·2–83·9)	8 (3–18)	176 (71–391)	20 (9–46)	38 (15–84)
South-East Asia Region	..	287 (243–524)	408	408	256·7 (183·3–586·7)	234·1 (198·2–427·3)	179·2 (142·4–296·0)	38·3 (36·9–129·3)	266 (206–338)	225 (184–276)	218 (169–277)	42 (34–51)
European Region	..	565 (460–603)	..	..	18·9 (9·4–37·7)	297·1 (241·9–317·1)	43·1 (34·0–50·8)	64·2 (39·4–72·2)	18 (10–33)	126 (69–250)	32 (19–59)	21 (11–42)
Eastern Mediterranean Region	..	409 (363–426)	..	..	104·9 (78·7–137·7)	473·6 (240·6–521·0)	32·8 (26·0–60·4)	31·4 (30·8–74·4)	86 (52–139)	183 (119–345)	41 (24–65)	65 (42–122)
Western Pacific Region	..	111 (104–124)	446	446	144·5 (96·3–208·7)	230·0 (215·4–256·8)	470·8 (195·2–485·3)	77·3 (76·8–143·7)	83 (68–100)	98 (47–201)	518 (428–629)	43 (21–88)
Global	..	1751 (1572–2120)	884	402	1525·8 (1056·3–2582·2)	1513·5 (1272·8–1832·5)	821·1 (453·0–945·1)	287·7 (226·1–575·2)	1230 (1092–1393)	980 (755–1311)	1100 (976–1245)	240 (187–325)

Data are thousands (95% CI). WHO established a system to track progress since 2017; data before 2017 were not available by region, hence they were based on published data. As data were missing for three regions, the global data do not total the regional numbers shown. HBV=hepatitis B virus. HCV=hepatitis C virus. *Global hepatitis report 2017 (pp 13, 16).[3] †Global progress report on HIV, viral hepatitis and sexually transmitted infections, 2021 (pp 8–13).[4] ‡Data shown are combined deaths caused by HBV and HCV infections.

Table 2: **Global estimates of new chronic hepatitis B and C infections and deaths by WHO region, in 2015, 2019, and 2022**

infections among the general population and across all ages in 2022: 1·2 million (95% CI 1·1–1·4) new chronic HBV infections and 1·0 million (0·8–1·3) new chronic HCV infections. The overall incidence of new HBV and HCV infections remained high but decreased compared to previous estimates in 2019 (1·5 million for HBV and 1·5 million for HCV; table 2). The majority of HBV infections occurred in the African Region (771 000 [95% CI 596 000–965 000]; 62·7% of new HBV infections globally) and the South-East Asia Region (266 000 [206 000–338 000]; 21·6% of infections globally). New HCV infections mainly occurred in the South-East Asia Region (225 000 [95% CI 184 000–276 000]; 22·9% of new HCV infections globally) and the Eastern Mediterranean Region (183 000 [119 000–345 000]; 18·7% of new infections globally).

We compared actual reported data with expected data and targets to identify gaps in incidence and mortality. According to WHO's viral hepatitis elimination targets and validation guidance,[5,6] the global hepatitis B incidence target for 2020 (HBsAg prevalence <1% among children aged <5 years) was achieved in 2022 (figure A) despite gaps in the African region; the global hepatitis C incidence target for 2020 (annual HCV incidence ≤5 per 100 000) was achieved in 2022, due to major contributions from the Eastern Mediterranean Region (figure B).

In 2022, among countries with verified data, 95 met the 2025 goal of HBV elimination of mother-to-child HBV transmission of 0·5% or lower (HBsAg prevalence in children aged ≤5 years), 47 countries met the 2030 goal of HBV elimination of mother-to-child HBV transmission of 0·1% or lower (HBsAg prevalence in children aged ≤5 years), 90 countries met the 2025 hepatitis C incidence goal (annual HCV incidence ≤13 per 100 000), 29 countries met the 2030 hepatitis C incidence goal (annual HCV incidence ≤5 per 100 000), 62 countries met the 2025 mortality target (combined HBV and HCV mortality of ≤10 per 100 000), and 30 countries met the 2030 mortality target (combined HBV and HCV incidence ≤6 per 100 000; appendix pp 20–23).

The number of people dying from HBV and HCV worldwide remained high, at about 1·3 million (95% CI 1·1–1·6) per year: 1·1 million (95% CI 0·98–1·24) from HBV and 240 000 (187 000–325 000) from HCV (table 2). The highest number of deaths in 2022 caused by HBV occurred in the Western Pacific Region (518 000 [95% CI 428 000–629 000]) and African Region (272 000 [210 000–340 000]), and the highest number of deaths from HCV occurred in the Eastern Mediterranean Region (65 000 [42 000–122 000]) and Western Pacific Region (43 000 [21 000–88 000]). Globally, in 2022, 47% of deaths caused by HBV occurred in Western Pacific Region and 27% of deaths from HCV occurred in the Eastern Mediterranean Region. Together, the Western Pacific Region contributed 42% of global deaths caused by HBV and HCV, and the African Region contributed 23% of deaths (table 2).

Overall, new deaths from chronic hepatitis increased in 2022 compared to 2019 and 2015, due to the deaths caused by HBV increasing from 821 000 in 2019 to 1·1 million in 2022 (table 2; figure A). The number of HCV deaths decreased in 2022 compared to 2019 (table 2; figure B). Based on WHO's annual mortality target for HBV of four or fewer deaths per 100 000,[5,6,15] the global hepatitis B mortality target for 2020 was not achieved in 2022 (figure A); the global hepatitis C mortality target of two or fewer deaths per 100 000 for 2020 was achieved in 2022 (figure B), mainly due to progress in the Eastern Mediterranean Region.

The hepatitis B vaccine for infants was introduced in 190 member states by the end of 2023. Global coverage with three doses of the hepatitis B vaccine is currently estimated at 83% according to data from the WHO/UNICEF Joint Reporting Form on Immunization.[16] Additionally, as of 2024, 117 member states have introduced the first dose of the hepatitis B vaccine to newborns within the first 24 h of life. In 2023, global coverage of the hepatitis B vaccine was 45% and ranged from 79% in the Western Pacific Region to 17% in the African Region (appendix pp 18–19).

Among the 254 million people living with hepatitis B in 2022, 34·1 million (95% CI 30·2–38·5) people (13·4% of all people living with hepatitis B) knew their status and 6·65 million people (5·89–7·52; 19·5% of people who knew their hepatitis B status) received treatment in 2022 per WHO or regional

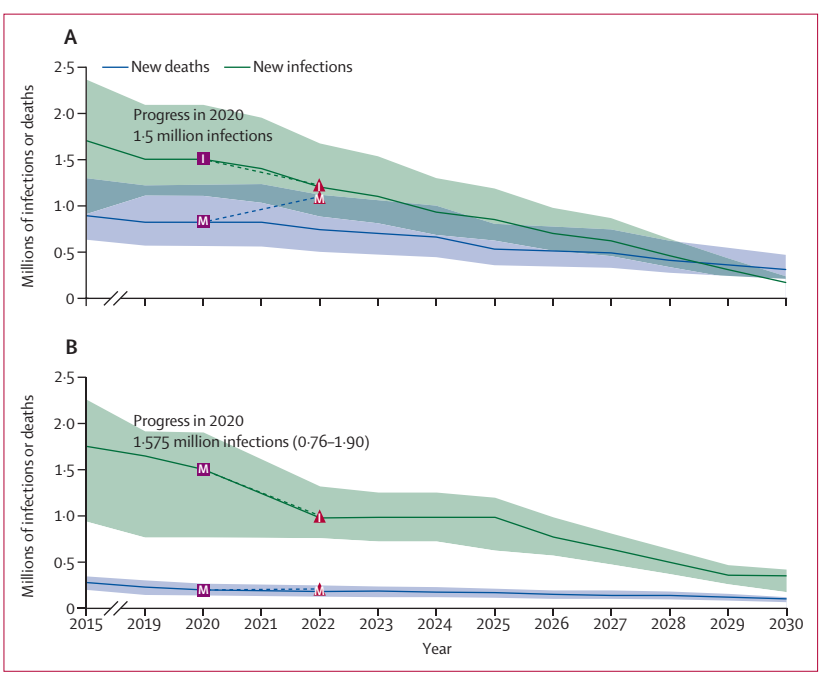

Figure: **Predicted hepatitis B incidence and mortality (A) and hepatitis C incidence and mortality (B) over 2015–30, based on data from 2015 and 2019**

The green lines and 95% CIs represent the incidence rate, and the blue lines and intervals represent the mortality rate. Purple squares indicate estimate of incidence or mortality in 2020.[4] Red triangles indicate estimates of incidence or mortality in 2022 from this study. I=incidence. M=mortality.

treatment criteria. The Western Pacific Region constituted 72·4% of global diagnosed HBV infections and 86·0% of the total number treated (table 3). Among 71 million people living with HCV infection in 2015, 25·7 million (95% CI 19·5–28·8) people (36·4% of those with HCV infection in 2015) were diagnosed to the end of 2022, and 12·5 million (95% CI 9·5–14·5; 48·6% of those who knew their status) were treated with direct-acting antiviral drugs in 2015–22 (table 3). The Eastern Mediterranean Region accounted for 50·6% of diagnosed HCV infections and 50·4% of HCV treatments undertaken globally (table 3). The number of individuals treated for chronic HCV globally increased 12 times since 2015 (from 994 000 in 2015 to 12 500 000 in 2022). Hepatitis B diagnosis coverage was only 13·4% globally, with the highest rates in the Western Pacific Region (25·5%), Region of the Americas (21·2%), and the European Region (15·7%), and the lowest rates in the African Region (4·2%) and South-East Asia Region (2·8%). The overall treatment coverage for chronic HBV infection was 2·6%, and was highest in the Western Pacific Region (5·9%) and lowest in the African Region (0·2%). Hepatitis C diagnosis coverage was 36·4% globally and highest in Eastern Mediterranean Region (48·6%), followed by the Western Pacific Region (45·2%), and lowest in the South-East Asia Region (25·5%) followed by the African Region (12·9%). Overall HCV treatment coverage was 17·6%, highest in the Eastern Mediterranean Region (42·0%) and lowest in the African Region (1·8%).

Discussion

WHO received verified data reports from 187 countries and territories in 2023, with contributions from partners, marking a major improvement in monitoring progress towards elimination of viral hepatitis. In 2022, globally, an estimated 254 million (3·27%) people were living with chronic HBV infection and 50 million (0·65%) people were living with chronic HCV infection, illustrating the high disease burden of hepatitis. In 2022, there were more than 2·2 million new chronic HBV and HCV infections and more than 1·3 million deaths due to HBV and HCV, with a substantial increase in HBV mortality; as a result, there were more deaths caused by hepatitis in 2022 than those caused by tuberculosis in 2023 (1·25 million [95% UI 1·13–1·37]).[11] However, only 2·6% of individuals with HBV infection and 17·6% of those with HCV infection received antiviral treatment, highlighting the urgent need to expand prevention and care services.

	Diagnosis						Treatment					
	2015*		2019†		2022		2015*		2019†		2022	
	Number of people with HBV infection diagnosed to end of 2015	Number of people with HCV infection diagnosed to end of 2015	Number of people with HBV infection diagnosed to end of 2019	Number of people with HCV infection diagnosed to end of 2019	Number of people with HBV infection diagnosed to end of 2022	Number of people with HCV infection diagnosed to end of 2022	Number of people receiving HBV treatment to end of 2015‡	Cumulative number of people initiating HCV treatment in 2015	Number of people receiving HBV treatment to end of 2019	Cumulative number of people initiating HCV treatment, 2015–19	Number of people receiving HBV treatment to end of 2022	Cumulative number of people initiating HCV treatment, 2015–22
African Region	153	660	1792 (1434–2500)	502 (402–628)	2700 (2077–3364)	1000 (513–2013)	..	13	105 (51–131)	51 (17–64)	150 (125–186)	200 (102–402)
Region of the Americas	669	2520	989 (792–1237)	1545 (1236–1931)	1100 (467–2486)	3100 (1228–6785)	..	277	155 (124–193)	1292 (1034–1615)	220 (98–519)	1800 (713–3040)
South-East Asia Region	888	900	1237 (430–1893)	728 (262–910)	1700 (1340–2195)	2700 (2196–3293)	..	63	136 (109–170)	504 (126–630)	60 (47–77)	1600 (1301–1951)
European Region§	1965	4340	2543 (2034–3178)	3331 (2665–4164)	1700 (975–3080)	2100 (1148–4151)	..	217	209 (167–261)	1168 (735–1460)	200 (118–374)	1300 (710–2570)
Eastern Mediterranean Region	351	2700	2464 (905–3080)	5581 (4465–6976)	2200 (1341–3610)	13 000 (8444–24 444)	..	324	441 (130–551)	4922 (3937–6153)	300 (182–489)	6300 (4092–11 846)
Western Pacific Region	17 484	2940	21 369 (17 095–26 711)	3503 (2803–4379)	24 700 (20 388–29 970)	3800 (1820–7707)	..	147	5591 (4473–6989)	1455 (1164–1819)	5720 (4722–6941)	1300 (622–2656)
Global	21 513	14 200	30 393 (24 315–37 992)	15 190 (12 152–18 988)	34 100 (30 200–38 522)	25 700 (19 532–28 784)	1700	1041	6637 (5309–8296)	9392 (7514–11 740)	6650 (5899–7524)	12 500 (9500–14 000)

Data are thousands (95% CI). WHO established a system to track progress since 2017; data before 2017 were not available by region, hence they were based on data published. HBV=hepatitis B virus. HCV=hepatitis C virus. *Data from the global hepatitis report 2017 (annex C).[3] †Global progress report on HIV, viral hepatitis and sexually transmitted infections, 2021 (pp 8–13).[4] ‡WHO established a system to track progress since 2017; data before 2017 were not available by region, hence they were based on published data. §Diagnosis data for the European Region in 2019 and 2022 were incomplete.

Table 3: **Global estimates of diagnosis and treatment of hepatitis B and hepatitis C by WHO region, in 2015, 2019, and 2022**

WHO and member states have made progress towards 2030 hepatitis elimination targets, providing a wider basis for policy implementation and opportunities for countries to scale up interventions. To achieve the 2030 targets, member states will need to rapidly scale up prevention and treatment services by the end of 2026. The latest estimates were based on country reports and additional partner contributions from 187 countries, providing key strategic information for policy development globally, regionally, and at country level. We also compared the latest data with baseline data from 2015, previous reports, and data from other sources to ensure quality and reliability. The completeness of data reporting has improved substantially, data have been collected transparently with countries and partners, and for the first time country data are available publicly to support implementation efforts. With these data, we can monitor progress towards targets and support policy gaps. Hepatitis B vaccination should be the priority in the African Region, particularly in infants born to women who are HBsAg positive, where coverage of the birth dose of the hepatitis B vaccine is low.[17,18] Expanded screening of hepatitis B in pregnant women and the general population and of hepatitis C in high-risk populations should be implemented urgently, followed by effective antiviral treatment for those diagnosed.[19–21] Countries must establish systems to track progress and validate elimination according to global, regional, and national action plans.[5,22] However, most countries are still at the stage of early scale-up of interventions.[23,24]

Based on the new updates, there were 254 million people living with HBV infection, similar to 2019 estimates and baseline data from 2015,[9] mainly due to the low seroconversion rate and the balance between new infections and hepatitis B prevention.[25] The number of people living with HCV infection was 50 million, 8 million less than the previous estimate, which might be related to increased rates of treatment and cure, improvements in data quality, birth cohort effects, as well as HCV liver-related mortality. The new data reaffirm that global elimination is still challenging and at an early stage, and that progress needs to be accelerated substantially. It also should be highlighted that prevention of mother-to-child transmission of HBV via delivery of a birth dose of hepatitis B vaccine is a key strategy for prevention and elimination of HBV, as WHO recommends.[7] Hepatitis interventions also prevent liver cancer and reduce future non-communicable disease burden.[26,27] Catch-up vaccination in children and adults at risk should also be considered in high prevalence countries.[28]

Global targets aim to reduce the number of new HBV and HCV infections by 90% by 2030. An estimated 62·7% (771 000) of new HBV infections occurred in the African Region, where hepatitis B vaccine coverage is low, and 22·9% (225 000) of new HCV infections occurred in the South-East Asia Region, where HCV prevalence is low (0·45%) compared with other regions. These regions need to intensify efforts to reduce the incidence of new infections and deaths. Egypt treated 4 million individuals with HCV in 2015–22 and thus reduced regional prevalence from 2·30% in 2015 to 1·64% in 2021, highlighting that substantial reductions in hepatitis mortality and incidence are possible with community-level public health elimination efforts.[29] Together, the African Region accounted for 42% (943 000) of new HBV and HCV infections globally and the South-East Asia Region accounted for 22% (491 000), highlighting the shifting geography of new infections. The incidence rate of hepatitis B in Africa is 4·3 times that of the global rate, and the incidence rate of hepatitis C in the Eastern Mediterranean Region is twice the global rate; therefore, the African Region and Eastern Mediterranean Region need to intensify investment in prevention efforts.[30,31] Expansion of hepatitis B vaccination is a priority in the African Region, both for newborns and high-risk adults, as well as diagnosis and treatment of pregnant women with hepatitis B. For the South-East Asia Region, expanded access to treatment for HCV infections is crucial to reduce incidence and mortality.[32] Unsafe medical injections and non-medical practices (eg, tattoos, ear piercings, and sharing razors) are likely to be a major contributor to HCV incidence in most regions, while high-risk populations, including people who inject drugs, contribute to the burden in the European Region and Region of the Americas, highlighting the need to prioritise these populations in prevention efforts.[33–35] Further research is required to estimate the burden of infections caused by non-medical practices and identify effective interventions to reduce the risk of such transmissions.

Global targets call for a 65% reduction in the number of people dying from viral hepatitis B and C by 2030. The latest estimates show that 1·3 million people died from viral hepatitis in 2022, which is still unacceptably high, and the number is increasing. Hepatitis continues to be a leading infectious disease killer, alongside tuberculosis, which caused an estimated 1·25 million (95% UI 1·13–1·37) deaths in 2023.[11] Global declines in HCV mortality are largely due to the high effectiveness of antiviral drugs and universal screening and treatment policies implemented in countries such as Egypt; by contrast, deaths caused by HBV have been increasing as effective antiviral treatment was only accessible to 2·6% of people with HBV infections in 2022. Pakistan now has the largest number of HCV infections and more than 50 000 HCV-related deaths annually, with an HCV incidence of 49·8 per 100 000 in 2022;[36] unless urgent action is taken to improve prevention and treatment services in this country, the number of deaths will remain high. Global declines in hepatitis incidence due to HBV immunisation and HCV cure, together with implementation of general prevention services, provide a strong foundation for sustainability; continued scale-up of treatment for HBV infection is crucial to reduce HBV mortality.[10,11,37]

Although hepatitis incidence in many regions is on track to meet the 2030 target, hepatitis remains a leading cause of global mortality and several regions are lagging behind on mortality targets; the disease burden is also unevenly distributed across regions. 38 focus countries constitute 80% of the global hepatitis burden; only 47 of 194 countries have met the 2030 goal of elimination of mother-to-child HBV transmission of 0·1% or lower (HBsAg prevalence in children ≤5 years), 29 have met the 2030 HCV incidence target, and 30 have met the 2030 mortality target; therefore, 75–85% of countries have huge gaps to reach the 2030 target if no action is taken.

Globally, progress on diagnosis and treatment is insufficient; around 87% of HBV infections and 64% of HCV infections remain undiagnosed and 97% of HBV infections and 83% of HCV infections are not treated. Treatment coverage for HBV is progressing too slowly despite the availability of affordable drugs, largely because the vast majority of HBV infections are not diagnosed. Access to drugs remains a challenge as many countries still pay higher than the global benchmark prices; moreover inclusion of these drugs and tests under domestic financing has been challenging in many countries and coverage remains inadequate. As a result, mortality due to HBV is increasing instead of declining.

Price reductions have made HCV treatment and cure an affordable high-impact intervention, but current coverage (17·6%) needs to increase by about five times in the next decade to reach the 2030 targets for elimination (72%). The progress reported in Egypt is promising, but overall global progress is slow and insufficient to reach 2030 targets.[29] The successes reported in Egypt need to be extended to another five to ten high-burden countries in the coming years, by implementing community-level universal access to diagnosis and treatment. The new WHO treatment guidelines provide an opportunity to treat a larger number of people with minimal additional diagnosis cost, while also extending testing and diagnosis services. If fully implemented, these treatment guidelines are expected to expand treatment coverage to 50% of all individuals diagnosed with HBV infection,[19] providing an important boost to the global response. Hepatitis diagnosis and treatment need to be substantially simplified and scaled up to achieve the 2030 mortality targets. Additionally, support from WHO is needed to reach 2025 interim targets and develop investment cases for priority countries to improve diagnosis and treatment coverage.[5] The 2024 WHO global hepatitis report[10] suggested that the overall cost curve requires a period of investment until 2028 followed by declining costs and increasing returns in terms of reduced hepatitis incidence, mortality, and cancer incidence, representing a return of US$2–3 per $1 invested, based on results from several country-level investment case studies.[19] Country-specific strategies can also show much higher returns on investments as HCV treatment prices continue to decline and cancer costs increase. For the South-East Asia Region and African Region, diagnosis and treatment coverage for both HBV and HCV are lower than average and far behind the 2030 target,[10] emphasising the need for financial and technical support in these regions. Globally, an estimated 47% of people who inject drugs have ever been tested for hepatitis C antibodies. Testing coverage is low (<40%) in 16 countries, moderate (40–75%) in 18 countries, and high (>75%) in 15 countries;[10] therefore, treatment and testing among priority populations should be expanded and linked to routine HIV programmes in these populations.[10] Additionally, a tailored approach should be included in national action plans to reach key at-risk populations such as people who inject drugs, prisoners, and patients on dialysis; coordination with correctional and community health services is also needed to further reduce hepatitis incidence and contribute to target achievement.

The first stage of expanding treatment access was encouraging, leading to achievement of the 2020 targets, yet access to treatment remains poor with large inequities. The next stage, from 2022 to 2030, requires considerable acceleration.[20] To further expand treatment coverage, diagnosis coverage needs to be scaled up, so that more people with hepatitis B or C infection know their infection status. However, there are large populations of people who do not receive treatment even after being diagnosed, and the new HBV guidelines provide a major opportunity to simplify and extend diagnosis and treatment services.

The cost of screening needs to be substantially reduced, efficiency of testing needs to be improved, and access to screening and testing services needs to be simplified.[20] Notably, only the Eastern Mediterranean Region achieved the 2020 HCV diagnosis target, mainly driven by the efforts in Egypt;[29] progress towards the 2020 HCV diagnosis target remains limited for other countries within this region. All regions should improve disease surveillance, leveraging the pandemic response as an opportunity to improve hepatitis data, and make increasing efforts to improve diagnosis coverage. Priority should be given to the African Region and South-East Asia Region, where diagnosis coverage is far below the global average, and a set of priority countries that represent the majority of the global disease burden. It is feasible to scale up testing and treatment services in these countries to ensure global progress is on track to meet 2030 targets. All countries should develop tailored action plans to improve testing and treatment coverage and improve surveillance to measure progress and better highlight gaps.[20] Point-of-care or rapid diagnostic tests can be used to increase accessibility to testing services. For countries with sufficient testing and clinical services, linking hepatitis testing to treatment should be integrated into national action plans. Additionally, low-income and middle-income countries, Pacific Islands, and some countries in Latin America still cannot afford the cost of drugs, so access to generic drugs is needed to facilitate

hepatitis elimination. Countries should invest in treatment of hepatitis to prevent future deaths and reduce economic and health-care costs in the long term.[10,20] In the South-East Asia Region, where diagnosis and treatment coverage is low, common challenges to elimination include sparse availability of reliable epidemiological data and insufficient public awareness of risk factors and modes of transmission, leading to underdiagnosis, poor access to care for people who inject drugs, and financial barriers to treatment and care.[38] The 38 member states that represent 80% of the global hepatitis burden (in particular, China, India, Indonesia, Nigeria, and Pakistan) should be prioritised to accelerate testing and treatment.

Similarly, although we have developed the GHSS and elimination validation framework, intensified efforts are needed to ensure implementation of, and access to, diagnosis and treatment based on global and country data. Notably, there is a large and growing population of individuals with HBV and HCV infection who are now living longer, thus increasing their risk of cancer and mortality, which will contribute substantially to the communicable and non-communicable disease burden in many countries. Providing effective antiviral treatment to all individuals with HBV and HCV infection is key to reduce mortality and cancer risk by 2030, but major gaps remain. Shifting to a public health approach before the end of 2026 is crucial, otherwise 2030 targets will not be reached.[10] If these targets (90% diagnosed, 90% receiving care, and 80% receiving treatment *vs* status quo) are not reached, there will be 2 million more cancers annually due to hepatitis, rising to 15 million by 2030, and 2·8 million lives lost annually, rising to 23 million by 2030.[10,39,40] Viral hepatitis could also result in a high disease burden among specific populations or geographical regions beyond the 38 priority countries that account for the majority of the global burden. All countries should make full use of the available opportunities to expand access to viral hepatitis prevention, testing, and treatment for all populations in need.

This study had various limitations. First, there were data quality issues, since many counties still do not have a system to monitor progress, and estimates for certain countries were based on multiple resources or partners' estimates. These issues highlight the need to develop treatment databases and estimates of burden based on different types of surveys in many countries, and to use these data to provide accurate and reliable estimates for these countries. Second, we estimated national, regional, and global incidence based on the data available, but there are several uncertainties remaining, particularly in relation to HCV and HBV incidence, since there is no surveillance system to track incidence in most countries. Third, we did not estimate the incidence of cirrhosis and cancers caused by HBV and HCV infection, did not study the natural history of hepatitis, and did not estimate the hepatitis burden in important risk groups. Fourth, there are some differences between multiple sources of estimates. We have provided training for countries to improve data quality and used the partner reference group to consolidate and align existing data to avoid bias and provide reliable estimates. Last, we only focused on the burden of disease, incidence, mortality, diagnosis, and treatment of hepatitis B and C, and did not analyse harm reduction interventions, policy implementation, or other areas of implementation; we also did not analyse data by sex.

The strength of the estimates includes improved reporting completeness compared with our previous estimates, the data verification process involving the ministry of health of each country, and verification by the partner reference group, all of which increased the reliability of the estimates. Additionally, the data are built on the GHSS and are consistent with previous estimates, which make them comparable across time. The updated data for 2022 are the new benchmark for the next 4–5 years and will guide the development of the new strategy and technical support for global, regional, and national implementation.

Few countries have adequate surveillance systems to track viral hepatitis incidence and mortality, serosurveys to track prevalence, and systems to monitor numbers diagnosed and treated. For many countries, incidence and mortality data were based on multiple sources of surveillance, including research articles or published literature, and diagnosis and treatment data were estimated on the basis of hospital data plus modelling and partners' estimates. Considering that serological surveys take several years to conduct, the country-level estimates were generated on the basis of historical data and surveys combined with vaccination coverage and disease surveillance data, plus modelling.

In summary, globally, there were 304 million HBV and HCV infections, 2·2 million new infections, and 1·3 million deaths due to viral hepatitis in 2022, and total treatment coverage only reached 2·6% for HBV infection and 17·6% for HCV infection. Global progress on hepatitis elimination has been encouraging since 2016, but progress towards elimination in 2030 has been insufficient; the next 2–3 years will be a key turning point. Deaths caused by HBV are increasing while global diagnosis and treatment coverage rates are still far too low, with major gaps across regions. The latest data highlight the urgent need to scale up prevention, screening, and treatment, and to implement new public health approaches, starting with the 38 priority countries. New approaches should consider the epidemiological, technological, and contextual shifts of recent years, identify opportunities to integrate multiple disease interventions, use innovations to implement people-centred health services in all health-care facilities, and ultimately expand universal health coverage. This effort requires national accountability based on verified data and investment into hepatitis interventions to fill the gaps,

particularly in low-income and middle-income countries. Following the guidance on national validation, each country needs to have a system in place to track progress and collect data on programme and impact indicators included in the monitoring system. Importantly, with limited resources, as the USA withdraws from WHO, the reduction in funding will affect the implementation of many tasks and could even cause a decline in the achievements made. Resource integration under the leadership of ministries of health and improved implementation and access to key hepatitis interventions are crucial to achieve the SDGs in the next few years.

Contributors

FC, DF, HR, and DL were involved in study conception and design, data analysis, interpretation of data, and drafting of the manuscript. DR, CMM, MAG, ASA, AM, PC, KI, MAG, MD, LO, NL, CDM, MD, TBH, SN, and PV contributed to data acquisition and provided critical revisions of the manuscript. MD, NL, MD, CDM, SN, TBH, and PV were involved in the interpretation of data and provided important guidance for this study. FC, HR, and DL were involved in the final revision of the manuscript. MD and DL supervised the study. CMM, MAG, ASA, AM, NS, PC, MD, NL, MD, CDM, SN, TBH, PV, and OL had access to and verified the data. All authors had full access to the data and had final responsibility for the decision to submit the manuscript for publication.

Declaration of interests

WHO relevant departments are fully funded by WHO. HR and DR received grants from Gilead Sciences, HepQuant, Merck, AbbVie, and GSK. MD received funding from the Bill & Melinda Gates Foundation. TH received grants from the UK Medical Research Council (MRC), the MRC Centre for Global Infectious Disease Analysis (a collaborating centre of WHO), and the International Agency for Research on Cancer (IARC), which receives funding from WHO. PV received funding from WHO and the Wellcome Trust. All authors declare no competing interests.

Data sharing

All country data collected for the study can be accessed on the WHO website: https://www.who.int/data/gho/data/themes/topics/indicator-groups/indicator-group-details/GHO/hepatitis-treatment. All regional data collected for the study can be obtained upon the request to corresponding author. Related documents are in the appendix (p 1), including global incremental policy implementation and strategical information developed towards 2030 hepatitis elimination (appendix p 1), indicators for monitoring the Global Health Sector Strategy on Viral Hepatitis (appendix pp 2–8), and the list of focused countries (appendix pp 9–10), country-specific estimate in focused countries in 2022 (appendix pp 11–17), hepatitis B vaccination coverage by region, third dose, 2015–23 (appendix pp 18–19), and targets of incidence and mortality by country (appendix pp 20–23).

Acknowledgments

We thank colleagues from WHO headquarters as well as regional and country offices who contributed to this work. For authors identified as employees of the International Agency for Research on Cancer or WHO, the views expressed are those of the authors and do not necessarily represent the decisions, policy, or views of either organisation.

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