

Viral Hepatitis in Somalia: An Updated Critical Review of Epidemiology and Public Health Priorities

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Systematic Review

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Abstract

Background

Viral hepatitis prevention and care are central to equitable global health, yet Somalia lacks a stable nationally representative evidence base. The existing literature combines historical surveys, facility studies, selected donor samples, high-risk populations and Somali diaspora data. This review updates the interpretation of that evidence and identifies policy priorities without treating setting-specific estimates as national prevalence.

Main body:

A historical meta-analysis of 29 studies documented high but heterogeneous markers of hepatitis A, B, C, D and E infection. Publications through 2025 continue to show large differences by population and testing frame: HBsAg positivity was 11.2% and 13.3% in two antenatal-facility studies, 9.7% in a Mogadishu blood-donor study and 2.8% among tested patients in one tertiary-hospital data set. HCV estimates also varied. These data support prevention, maternal testing and linkage to care, but they do not establish a current national prevalence. Evidence of incomplete hepatitis B vaccination among health-sciences students and ongoing risk in haemodialysis and blood-service settings reinforces the need for service-integrated action.

Conclusion

Somalia needs a coordinated viral hepatitis response built around timely infant vaccination, antenatal HBsAg testing and prevention of mother-to-child transmission, safe blood and injection practices, accessible diagnosis and treatment, health-worker vaccination and national surveillance. Future nationally representative surveys and linked routine data are essential to measure progress fairly.

Background

Viral hepatitis remains a major cause of preventable liver disease worldwide. The World Health Organization (WHO) estimated that hepatitis B virus (HBV) and hepatitis C virus (HCV) together caused 1.3 million deaths in 2022, primarily from cirrhosis and hepatocellular carcinoma [1]. The global health sector strategies for 2022–2030 call for integrated prevention, testing, treatment and monitoring, with attention to inequities in access [2]. These aims are particularly relevant in settings where health services are disrupted, laboratory capacity is uneven and population-based disease surveillance is limited.

Somalia is commonly described as a high-burden setting for viral hepatitis, but that label requires careful interpretation. Published studies have used different periods, tests, sampling frames and clinical

populations. A prevalence estimate from a blood-donor panel, an antenatal clinic, a haemodialysis unit or a Somali diaspora programme answers a different question from a nationally representative household survey. Collapsing these estimates into one contemporary national figure can misdirect policy, conceal uncertainty and create unrealistic expectations for programme measurement.

The purpose of this updated critical review is therefore not to re-estimate Somalia's national prevalence. It is to synthesize the most decision-relevant evidence on hepatitis A–E in Somalia, distinguish historical and setting-specific findings from generalizable information and identify practicable priorities for prevention and care. The paper is designed for public-health and policy use, with a deliberate focus on maternal services, vaccination, blood and injection safety, testing, treatment and surveillance.

Main body

Approach to the evidence

A structured, targeted update was conducted in PubMed/MEDLINE and official WHO sources on 6 September 2026, focusing on publications available through 31 December 2025. The PubMed search combined (Somalia OR Somali) with hepatitis, HBV, HCV, HDV, HEV and HAV in titles or abstracts. Reference lists of key reviews and primary studies were also examined. Eligible evidence described epidemiology, seroprevalence, prevention, service delivery, vaccination or risk factors in Somalia or, where clearly labelled, Somali diaspora populations. Official WHO documents were used for global policy framing rather than to infer Somalia-specific coverage or programme performance.

This paper is presented as a critical Review article rather than as a de novo systematic review or meta-analysis because an auditable search export, screening log, risk-of-bias assessment and verifiable registry record were not available for a full systematic update. No quantitative meta-analysis or PRISMA flow diagram is reported. The full search wording, source-selection principles and characteristics of the evidence used in this revision are provided in Additional file 1.

Registration and protocol: no verifiable public registration or protocol record was identified during this revision. An AI-assisted tool was used for editorial drafting and format checking. It did not qualify for authorship; the authors accept responsibility for the final manuscript.

Historical epidemiology and its limits

The most comprehensive historical synthesis remains the 2018 systematic review and meta-analysis by Hassan-Kadle and colleagues, which included 29 studies published between 1977 and 2016 [3]. It reported pooled marker prevalences of 90.2% for hepatitis A virus (HAV), 18.9% for HBV, 4.84% for HCV, 28.99% for hepatitis D virus (HDV) and 46.86% for hepatitis E virus (HEV). These figures demonstrate that viral hepatitis has long been a public-health concern in Somali populations, but they should not be presented as current national estimates. The studies varied substantially in date, location, population,

diagnostic method and clinical selection, and several data sets were from people with liver disease or other high-risk settings.

The historical HBV synthesis is especially important but often overinterpreted. The pooled HBsAg estimate of 18.9% had a wide confidence interval (14.0%–29.0%), and the subgroup estimate in pregnant women derived from a very small number of old Mogadishu studies [3]. It supports the need to prevent perinatal and early-childhood transmission; it does not quantify today's national maternal or general-population prevalence. Likewise, HCV estimates from historical clinical populations should not be extrapolated to the community. A regional systematic review of HCV in Djibouti, Somalia, Sudan and Yemen reached similarly cautious conclusions about heterogeneous and sparse country data [5].

HEV evidence illustrates the same principle. During Operation Restore Hope, anti-HEV immunoglobulin M was found in 20 of 31 Somali patients evaluated for acute hepatitis between December 1992 and February 1993 [4]. This was a clinically important outbreak signal, not a population survey. The historical meta-analysis also found high HEV marker prevalence, but its data were old and geographically restricted [3]. Contemporary surveillance capable of distinguishing sporadic disease from outbreaks is needed before using those figures to describe current HEV burden.

Updated evidence from priority populations

Pregnant women and prevention of mother-to-child transmission

Recent antenatal studies underline why maternal hepatitis services are a priority while also demonstrating why no single facility estimate should be nationalized. A cross-sectional study of 384 pregnant women attending SOS Hospital in Mogadishu found HBsAg positivity of 11.2% [8]. A 2025 study at Demartino Hospital reported HBsAg positivity of 13.3% and observed associations with blood transfusion, abortion history, household hepatitis history and sharing sharp materials [9]. In contrast, a retrospective tertiary-hospital data set covering 7 836 HBV tests between 2017 and 2021 reported HBsAg positivity of 2.8%; among 7 791 anti-HCV tests, positivity was 0.4% [10].

The apparent differences may reflect patient selection, time period, test indication, denominator definition, laboratory methods and local epidemiology. They should be treated as evidence of service-level risk and data heterogeneity, not as contradictory national prevalence estimates. In practical terms, the studies support an antenatal pathway in which HBsAg testing is routinely offered, positive women are assessed and linked to care, and infants receive timely hepatitis B vaccination with follow-up. The pathway should be monitored through programme indicators rather than inferred from occasional research samples.

Blood donors, dialysis and health-care pathways

Blood services and renal care represent priority settings for prevention and surveillance. In a 2024 Mogadishu study of 494 blood donors, HBV infection prevalence was 9.7% (95% confidence interval 7.1%–12.3%), and only 15% of participants reported a previous HBV vaccination [7]. Blood donors are a selected population; nevertheless, the result emphasizes the importance of universal quality-assured donor screening, donor counselling, safe blood use and linkage of positive donors to evaluation and care.

Among 220 patients receiving haemodialysis in Somalia, HBV and HCV prevalences were 7.3% and 3.2%, respectively [6]. Haemodialysis patients are not a proxy for the general population; their risk reflects repeated health-care exposure, transfusion history and the need for consistently safe infection-prevention practices. The finding supports routine screening at entry into dialysis, periodic monitoring according to local policy, vaccination of susceptible patients and staff, adequate supplies for standard precautions and referral routes for chronic HBV or HCV care.

Vaccination among future health workers

Two surveys of health-sciences students suggest that vaccine access and completion remain uneven. In Bosaso, only 2.8% of 247 medical students reported completing the hepatitis B vaccine series [11]. In Mogadishu, 33.4% of 569 health-sciences students reported full vaccination [12]. The difference may relate to setting, availability, cost, cohort and self-report, but both studies identify an actionable occupational-health gap. Institutions training workers who may be exposed to blood should provide no-cost or affordable vaccination, document dose completion and maintain post-exposure protocols.

Somali diaspora evidence

Evidence from Somali communities outside Somalia can inform culturally responsive services, but it must remain context-specific. A Minnesota community study described substantial chronic HBV and HCV burden among Somalis and linked this to an increasing hepatocellular carcinoma concern [13]. Migration histories, access to screening and treatment, age distributions and local service delivery differ from those in Somalia. Diaspora studies should therefore guide outreach and equity strategies in the host setting, not be pooled with Somalia studies to estimate national burden. Table 1 summarizes the principal Somali hepatitis studies by evidence setting and study population and indicates how each result should be interpreted.

[Table should appear here.]

Table 1
Interpreting Somali hepatitis studies by population

Evidence setting	Study population / period	Selected result	Appropriate interpretation
Historical meta-analysis [3]	29 studies, 1977–2016	HBV 18.9%; HCV 4.84%	Historical heterogeneous synthesis; not current national prevalence.
Antenatal clinic [8]	384 pregnant women, Mogadishu	HBsAg 11.2%	One facility; supports antenatal testing and prevention.
Antenatal clinic [9]	Pregnant women, Demartino Hospital	HBsAg 13.3%	One facility; risk-factor associations need local service response.
Tertiary test records [10]	7 836 HBV tests; 7 791 HCV tests	HBsAg 2.8%; anti-HCV 0.4%	Test-record denominator; cannot represent all pregnant women or Somalia.
Blood donors [7]	494 donors, Mogadishu	HBV 9.7%	Selected donors; reinforces safe blood and linkage to care.
Haemodialysis [6]	220 patients	HBV 7.3%; HCV 3.2%	High-risk clinical population; supports infection prevention.
Health-sciences students [11, 12]	247 in Bosaso; 569 in Mogadishu	Full vaccination 2.8% and 33.4%	Self-reported, local surveys; shows occupational vaccination gap.

Legend. HBV hepatitis B virus; HCV hepatitis C virus; HBsAg hepatitis B surface antigen. Percentages are reported as published. Each study addresses a distinct population and should not be pooled as a national estimate.

Public health priorities

First, prevention should start with a reliable vaccination pathway. WHO recommends a hepatitis B vaccine dose as soon as possible after birth, preferably within 24 hours, followed by completion of the infant series [14]. For Somalia, the priority is not merely to announce a target but to establish an accountable delivery system: vaccine availability in maternity and newborn settings, documentation of the timely dose, follow-up for subsequent doses, outreach for home births and regular review of missed opportunities. Routine immunization data should be assessed using official country-programme systems rather than informal web estimates [15].

Second, maternal services should connect testing to action. Antenatal HBsAg testing, counselling, clinical assessment of women with positive results and timely newborn vaccination are mutually dependent. Depending on national policy and available services, women meeting treatment criteria should have a clear referral pathway. The maternal programme should capture testing uptake, positivity, linkage to evaluation, timely infant vaccination and follow-up completion. These measures are more

useful for quality improvement than attempting to compare one clinic's prevalence with another without standardized methods.

Third, blood and injection safety must be treated as a shared systems function. The donor and dialysis evidence identifies repeated health-care exposure as an important practical concern [6, 7]. Quality-assured screening of every donation, rational use of blood, functioning infection-prevention supplies, sharps safety, staff training and referral for people with positive results should be implemented together. Stand-alone screening without counselling and linkage to care risks creating a diagnostic endpoint rather than a clinical benefit.

Fourth, testing and treatment need a primary-care-oriented service model. WHO policy emphasizes simplified approaches that expand access to prevention, diagnosis and chronic hepatitis care [2, 14]. In Somalia, priorities include validated assays, clear diagnostic algorithms, affordable viral-load or alternative staging access where indicated, dependable referral pathways and continuity of antiviral treatment. Service delivery must be planned for people affected by displacement, poverty, distance and interrupted care, not only for urban referral hospitals.

Fifth, national surveillance should become the foundation for equity and accountability. A minimum data architecture would distinguish screened persons from diagnosed cases, include basic demographic and geographic fields, identify pregnancy status where appropriate, document linkage and treatment, and monitor infant vaccination. Periodic standardized serosurveys are needed to estimate population prevalence and under-five HBsAg prevalence; laboratory quality assurance is essential. Such data could clarify whether differences among the recent facility studies are primarily epidemiologic, programmatic or methodological.

Finally, interventions should be designed with communities and providers. Stigma, incomplete knowledge and cost can reduce uptake of testing, vaccination and long-term care. Student vaccination studies show that access barriers are not abstract [11, 12]. Communication should be in locally appropriate languages and avoid treating Somali communities as a homogeneous risk group. Community engagement, respectful counselling and protection against discrimination are necessary complements to biomedical services. Table 2 summarizes these six priorities, the corresponding implementation focus and an example indicator for each.

[Table 2 should appear here.]

Table 2
Priority actions supported by the evidence

Priority	Implementation focus	Example indicator
Timely infant vaccination	Provide a birth dose within 24 hours and complete the infant series.	Proportion of live births receiving a timely HepB birth dose.
Antenatal pathway	Offer HBsAg testing, assess positive women and ensure newborn prophylaxis.	Testing uptake; linkage; timely infant vaccination.
Safe blood and injections	Screen all donations; strengthen infection prevention and referral.	Proportion of donations quality-assured screened.
Testing and treatment	Use clear algorithms and reliable referral and medicine supply.	Diagnosed people linked to care and retained on treatment.
Workforce protection	Offer documented HepB vaccination and post-exposure procedures.	Health-worker and trainee series completion.
Surveillance	Use standardized routine data and periodic serosurveys.	Completeness, timeliness and representativeness of reporting.

Legend. HepB hepatitis B vaccine; HBsAg hepatitis B surface antigen. Indicators should be defined in national protocols before implementation and disaggregated where feasible to identify inequities.

Pathogen-specific implications for services

HBV should remain the organizing priority of a national viral-hepatitis response because prevention at birth and in early childhood can avert lifelong infection. WHO notes that chronic infection is particularly likely when HBV is acquired in infancy or early childhood, which makes timely vaccination and maternal services complementary rather than separate programmes [14]. The recent antenatal studies cannot determine the national prevalence in pregnant women, but they are sufficient to demonstrate that maternity services must be able to identify women with HBsAg positivity and act on the result. In a resource-constrained setting, the first test of an HBV strategy is whether a woman who is screened positive and an infant who is born to her can be followed through a safe, timely and documented care pathway.

HCV requires a different measurement discipline. Anti-HCV positivity and active viraemia are not interchangeable, and facility reports should make clear which marker and denominator were used. The tertiary-hospital test records reported anti-HCV positivity, whereas the haemodialysis study reported HCV prevalence in a high-risk clinical population [6, 10]. Neither measurement can estimate community prevalence or treatment need on its own. National planning should therefore record the cascade from antibody screening to confirmatory testing, clinical assessment, treatment initiation, cure assessment where used and retention in care. Otherwise, a programme may report large numbers of people screened without knowing how many have active infection or have received effective treatment.

HDV should not disappear from the agenda simply because recent Somali data are scarce. In the historical review, HDV markers were frequent among selected populations with chronic liver disease [3]. That evidence does not establish contemporary prevalence, but it indicates a need for an explicit clinical question in HBV services: which people with chronic HBV should be assessed for possible HDV, and where can confirmatory testing or specialist referral be obtained? A national protocol should identify a realistic testing and referral pathway before introducing an indicator that cannot be acted upon.

HAV and HEV require an outbreak-readiness lens. The older evidence suggests substantial prior exposure and describes a clinically important HEV episode, but it does not replace current surveillance [3, 4]. Acute jaundice or hepatitis syndromes should be investigated using standardized case definitions, timely laboratory access where feasible and rapid notification. The public-health response should be coordinated with water, sanitation, food safety and maternal-care services, especially when outbreaks affect displaced or underserved populations. The goal is not to infer present endemicity from decades-old serology; it is to ensure that new clusters can be detected, investigated and managed before they are amplified by service disruption.

From evidence to an accountable programme

A practical national plan should distinguish three linked but different functions: prevention, clinical care and measurement. Prevention reduces infection through vaccination, safe blood, safe injections and risk communication. Clinical care identifies and manages people already infected through testing, counselling, assessment, treatment and long-term monitoring. Measurement tracks the reach and quality of both functions. In the available Somali evidence, these functions are often reported separately: a student survey describes vaccination; an antenatal study describes HBsAg positivity; a donor study describes a blood-service sample; and a hospital data set describes testing records. A national programme must connect these pieces rather than assume that one study demonstrates the success or failure of the whole system.

Indicator selection should follow the pathway of care. For prevention, this includes vaccine stock continuity, timely birth-dose delivery, completion of the infant series and vaccination of people with occupational exposure. For maternal services, it includes the number offered HBsAg testing, the proportion receiving a result, the proportion of positive women receiving clinical assessment, and the proportion of exposed infants receiving timely prophylaxis. For blood services, it includes documented quality-assured screening of all donations, referral of reactive donors and availability of confirmatory testing. For clinical care, it includes diagnosis, linkage, treatment eligibility assessment, treatment initiation and retention. These indicators should be reported with denominators, time periods and geography so that apparent improvement is not simply a change in testing volume.

Equity should be built into programme design at the outset. The most visible facilities in Mogadishu may have better laboratories and research partners than peripheral, rural, mobile or displaced populations. A system that reports only hospital data can therefore create the illusion of national coverage while leaving the populations with the greatest access barriers invisible. Disaggregation by age, sex, pregnancy status,

residence or displacement status where safe and feasible can identify gaps, but data collection must protect confidentiality and avoid stigmatizing communities. Community organizations and front-line providers should help design the counselling, referral and follow-up procedures that determine whether a positive test is useful to the individual.

Research agenda

Somalia needs a sequenced research agenda rather than another unconnected series of convenience samples. First, a nationally coordinated, stratified serosurvey with standardized laboratory methods is needed to estimate HBV and HCV markers across age groups and regions. The design should define whether it measures exposure, chronic infection or active infection and should include a plan for communicating results and linking participants with positive findings to care. A repeatable survey design would allow change over time to be assessed without confusing changes in sampling with changes in disease burden.

Second, maternal and newborn implementation research is required. A prospective cohort or routine-service evaluation could measure antenatal HBsAg testing, clinical assessment, birth-dose timing, completion of the vaccine series and infant follow-up. This would generate more useful information for prevention of mother-to-child transmission than a cross-sectional prevalence figure alone. Third, clinical cohorts should describe care outcomes among people with chronic HBV, HCV or suspected HDV, including access to confirmatory testing, treatment eligibility assessment, medicine continuity and liver-disease outcomes. Fourth, periodic studies of health workers, trainees, blood-service staff and dialysis units should assess both infection-prevention practice and vaccination documentation.

All future studies should make their denominators and laboratory definitions explicit. Reports should state whether a result is HBsAg, anti-HCV, HCV RNA, anti-HEV immunoglobulin M or another marker; whether participants were screened universally or tested because of clinical indications; and whether the sample is intended to represent a locality, a facility or a wider population. Simple reporting discipline will make the evidence base more comparable and reduce the risk that prevalence estimates are repeated out of context.

Strengths and limitations

This review's main strength is its explicit separation of historical pooled results, selected recent facility estimates and global policy guidance. It retains primary studies that can inform action while avoiding unsupported claims that a single estimate represents all Somali people. It also recognizes that epidemiology and health-system capacity must be interpreted together.

The limitations are substantial. The review is not a new systematic review with a prospectively registered protocol, independent duplicate screening, formal risk-of-bias assessment or a reproducible study-flow count. Evidence is sparse for nationally representative prevalence, HBV treatment coverage, HCV viraemia and treatment, HDV, HEV, HAV, liver outcomes and population groups affected by displacement. The included facility, donor, dialysis and student studies are subject to selection bias and may use

different assay strategies. Findings should therefore guide programme design and research priorities, not produce a definitive national burden estimate.

Conclusion

The available evidence establishes viral hepatitis as a sustained public-health priority in Somalia but does not justify a single current national prevalence figure. Historical meta-analytic estimates and recent setting-specific studies point to the need for a practical, equitable response: timely infant hepatitis B vaccination, maternal HBsAg testing and prevention of mother-to-child transmission, safe blood and injections, accessible testing and care, protection of health workers and better surveillance. A nationally coordinated data strategy is now as important as service expansion, because progress toward elimination cannot be measured fairly without representative and connected evidence.

Abbreviations

anti-HCV, antibody to hepatitis C virus; HAV, hepatitis A virus; HBV, hepatitis B virus; HBsAg, hepatitis B surface antigen; HCV, hepatitis C virus; HDV, hepatitis D virus; HEV, hepatitis E virus; WHO, World Health Organization.

Declarations

Ethics approval and consent to participate

Not applicable.

Consent for publication

Not applicable.

Availability of data and materials

All data analysed in this review are contained in the article and Additional file 1. No new data set was generated.

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

AYA conceptualized the review, verified the cited sources, interpreted the evidence, drafted and revised the manuscript, and approved the final manuscript. AHMM (Always Hussein Mohammed Mohammed) provided authorship support, assisted in refining the manuscript, and approved the final version.

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Authors' information

Not applicable.

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