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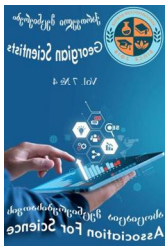

Hepatitis B in Georgia: Progress, Gaps, and Equity Across the Prevention-to-Care Cascade

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Abstract

Aim: Hepatitis B virus (HBV) remains a major cause of cirrhosis and hepatocellular carcinoma globally. This review assesses Georgia's progress toward the World Health Organization (WHO) Global Health Sector Strategies (GHSS) 2022–2030 targets for eliminating viral hepatitis as a public-health problem, with a focus on the prevention-to-care cascade.

Subject and Methods: Georgia, a country in the WHO European Region, has sustained high infant hepatitis B vaccination coverage and conducted two nationwide hepatitis B virus serosurveys, yet publicly available evidence is dispersed. We systematically searched MEDLINE, Embase and Scopus, and reviewed grey literature from WHO, WHO/UNICEF Estimates of National Immunization Coverage (WUENIC), the U.S. Centers for Disease Control and Prevention (CDC), the Coalition for Global Hepatitis Elimination (CGHE) and national/partner reports. Evidence was synthesized across four domains: epidemiology; prevention through vaccination and prevention of mother-to-child transmission; testing–treatment care cascade; and equity.

Results: Available data indicate adult hepatitis B surface antigen (HBsAg) prevalence of 2.9% in 2015 and 2.7% in 2021; among children aged 5–17 years, HBsAg prevalence was 0.03% in 2021, reflecting immunization impact. Hepatitis B birth dose and three-dose infant series coverage generally exceeded 90% over the last decade. However, evidence on adult diagnosis and antiviral treatment coverage, and on subgroup disparities, remains limited.

Conclusion: Consolidating epidemiologic and program indicators clarifies Georgia's progress toward GHSS 2030 targets and highlights priorities to strengthen adult testing, linkage and treatment, and to ensure equitable access to prevention and care across the hepatitis B cascade.

Keywords: hepatitis B; Georgia; vaccination; care cascade; health equity

Introduction

Viral hepatitis remains one of the leading causes of chronic liver disease and liver-related mortality worldwide. In 2022, the World Health Organization (WHO) adopted updated Global Health Sector Strategies (GHSS) 2022–2030, which aim to eliminate viral hepatitis as a public-health problem by 2030. The targets call for a 90% reduction in new chronic infections and a 65% reduction in mortality compared with 2015 levels (World Health Organization 2022a, 2022b).

Within the WHO European Region, Georgia has been an early adopter of hepatitis-control initiatives. The country introduced infant hepatitis B vaccination in 2001 and the hepatitis B birth dose (HepB-BD) in 2003. Data from the WHO/UNICEF Estimates of National Immunization Coverage (WUENIC) show that both the HepB-BD and the three-dose infant series (HepB3) have exceeded 90% coverage for most years of the past decade (WHO/UNICEF 2025). In addition, Georgia implemented comprehensive prevention of mother-to-child transmission (PMTCT) interventions within maternal and child health programs, contributing to an extremely low prevalence of infection among children.

Two nationwide serosurveys illustrate this impact. The 2015 adult survey reported hepatitis B surface antigen (HBsAg) prevalence at 2.9%, while the 2021 survey found 2.7% among adults and 0.03% among children aged 5–17 years, demonstrating near-elimination of pediatric hepatitis B virus (HBV) infection (Kasradze et al. 2020; Khetsuriani et al. 2023; Tohme et al. 2024).

Despite strong prevention indicators, published and program sources indicate limited monitoring data on adult HBsAg and HBV DNA testing, non-invasive and invasive fibrosis assessment (transient elastography and liver biopsy), and antiviral-treatment coverage, as well as the absence of a national HBV treatment registry (Coalition for Global Hepatitis Elimination 2025; Tohme et al. 2024). Understanding distributional differences by geography, age, sex, and key populations across the prevention-to-care cascade is essential to align Georgia's progress with GHSS targets and ensure equitable access to diagnosis and treatment.

Objective: To synthesize and map HBV evidence from 1 January 2015 to 30 September 2025 in Georgia—covering epidemiology; prevention through vaccination and PMTCT; the testing–treatment cascade; and equity and to identify progress and gaps relative to WHO GHSS 2030 targets.

Methods

Review design and reporting standard

This scoping review followed the methodological framework of Arksey and O'Malley (2005) and was reported according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) checklist (Tricco et al.

2018). The review aimed to map available evidence on HBV in Georgia to inform national policy within the WHO European Region framework.

Eligibility criteria

We included sources published from 1 January 2015 to 30 September 2025 that reported data from Georgia on: (i) HBV epidemiology, including HBsAg and/or total hepatitis B core antibody (anti-HBc) prevalence; (ii) prevention indicators, including hepatitis B birth dose (HepB-BD), the three-dose infant series (HepB3), and PMTCT; (iii) the testing–treatment cascade, including proportions diagnosed, eligible for treatment, and treated; and (iv) equity dimensions, including sex, age, geography, and key populations. We included peer-reviewed studies (observational designs, serosurveys, and program evaluations) and authoritative grey literature WHO and WUENIC, U.S. Centers for Disease Control and Prevention (CDC), Coalition for Global Hepatitis Elimination (CGHE), and national or partner reports). Sources in English or Georgian with extractable data were eligible. We excluded hepatitis C virus (HCV) only analyses, case reports, commentaries without data, and multinational studies without disaggregated Georgian findings.

Information sources

Evidence was retrieved from MEDLINE (via PubMed), Embase, and Scopus. Grey-literature sources comprised WHO hepatitis portals and GHSS materials, WHO/UNICEF WUENIC dashboards, the CDC hepatitis portal and Morbidity and Mortality Weekly Report (MMWR) publications, CGHE country profiles, and publicly available reports from Georgia's Ministry of Health and National Center for Disease Control and Public Health (NCDC) (WHO/UNICEF 2025; Tohme et al. 2024; Coalition for Global Hepatitis Elimination 2025).

Search strategy

We applied structured Boolean searches combining disease, country, and program terms. The PubMed strategy was:
("hepatitis B" OR HBV OR "hepatitis B virus") AND (Georgia [tiab] OR Georgian [tiab]) AND (prevalence OR epidemiology OR vaccination OR "birth dose" OR PMTCT OR screening OR diagnosis OR treatment OR cascade OR coverage OR elimination). Search strings were adapted for Embase and Scopus. Grey-literature queries used platform filters (for example, WUENIC, country = Georgia; U.S. CDC MMWR keyword "Georgia hepatitis B").

Selection process

Titles and abstracts were screened independently by two reviewers, and full texts were assessed against eligibility criteria. Disagreements were resolved through discussion, and reasons for exclusion at the full-text stage were documented. Study selection results were summarized in a PRISMA-ScR flow diagram.

Data charting and variables

We developed a standardized extraction form in Microsoft Excel capturing citation, year, study design or data source, population, indicator values (e.g., HBsAg prevalence, HepB-BD/HepB3 coverage, proportions diagnosed or treated), equity dimensions (sex, age, geography, and key populations), and study limitations. For dynamic grey sources (such as WHO or WUENIC dashboards), extracted values were cross-checked with the most recent version at the time of charting to ensure internal consistency.

Synthesis and presentation

Extracted data were summarized narratively and organized into four domains: (1) epidemiology; (2) vaccination and PMTCT; (3) testing–treatment cascade; and (4) equity. Indicator values were benchmarked against the WHO GHSS 2030 targets and WUENIC performance thresholds (World Health Organization 2022a, 2022b; WHO/UNICEF 2025). Descriptive figures including evidence maps, vaccination coverage trends, and cascade diagrams were generated in Microsoft Excel.

Patient and public involvement

No patients or members of the public were involved in the design or conduct of this review.

Results

Epidemiology

Table 1 summarizes key hepatitis B indicators in Georgia from 2015 to 2025, including national estimates of HBsAg and total anti-HBc prevalence, vaccination and PMTCT coverage, testing–treatment cascade data, and equity-related system indicators. In 2015, an adult serosurvey among individuals aged ≥ 18 years reported an HBsAg prevalence of 2.9 % and anti-HBc prevalence of 25.9 % (Kasradze et al. 2020). The follow-up 2021 survey showed HBsAg 2.7 % (95 % CI: 2.3–3.4) and anti-HBc 21.7 % (95 % CI: 20.4–23.2) among adults; among children aged 5–17 years, HBsAg was 0.03 % (95 % CI: 0.0–0.19) and anti-HBc 0.7 % (95 % CI: 0.3–1.6) (Khetsuriani et al. 2023). These findings confirm near-elimination of pediatric infection, consistent with sustained high HepB-BD and HepB3 coverage, while adult prevalence remains similar to 2015, indicating a persistent reservoir in older cohorts (Khetsuriani et al. 2023; Tohme et al. 2024).

Prevention (vaccination and PMTCT)

Georgia has maintained high hepatitis B vaccination coverage for more than a decade. According to WUENIC, the three-dose infant series (HepB3) coverage ranged from 94 % to 98 % between 2015 and 2024, while timely administration of the birth dose (HepB-BD) ranged from 90 % to 96 % (WHO/UNICEF 2025). These levels exceed the WHO GHSS 2030 targets of ≥ 90 % for both indicators and align with the near-zero HBsAg prevalence among children in the 2021 serosurvey.

PMTCT has been progressively integrated into Georgia's maternal and child health services. National PMTCT guidelines recommend universal antenatal HBsAg screening, administration of hepatitis B vaccine and hepatitis B immune globulin (HBIG) to infants born to HBsAg-positive mothers, and post-vaccination serologic testing when feasible. Implementation reports from the NCDC and the Ministry of Health indicate increasing coverage of antenatal screening and timely post-exposure prophylaxis in maternity facilities nationwide (NCDC 2024; World Health Organization 2024). Collectively, these data confirm that Georgia has achieved and sustained high levels of vaccination and perinatal prevention, contributing to the virtual elimination of HBV infection among children born after 2003. Remaining challenges include maintaining uniform birth-dose timeliness in remote areas, ensuring adequate HBIG supply, and extending PMTCT follow-up systems to monitor post-vaccination seroprotection rates.

Testing–Treatment Cascade

Published and programmatic evidence reveals that while vaccination and pediatric control are well established, adult HBV diagnosis and treatment coverage remain limited. The 2024 CDC Morbidity and Mortality Weekly Report (MMWR) report estimated that only about 25 % of persons with chronic HBV infection in Georgia had been diagnosed and approximately 5 % had initiated antiviral therapy (Tohme et al. 2024). The Coalition for Global Hepatitis Elimination (CGHE 2025) country profile likewise reported that HBV diagnosis and treatment monitoring systems were not yet fully implemented. No national registry exists for treatment tracking or longitudinal clinical monitoring. Available program data from pilot clinics suggest that tenofovir and entecavir are the most commonly used first-line agents and that treatment eligibility assessment often relies on HBV DNA quantification and fibrosis staging by transient elastography or biochemical indices (APRI/FIB-4). However, population-level data on these clinical parameters remain scarce. These gaps underscore the need to expand routine adult screening beyond blood donors and pregnant women and to strengthen linkage-to-care systems integrated with existing hepatitis C elimination infrastructure (CGHE 2025; World Health Organization 2024).

Equity and Programmatic Gaps

Across the prevention-to-care cascade, evidence on inequities by sex, age, region, and population group remains limited. The 2015 and 2021 serosurveys found no major sex differences in HBsAg prevalence, but higher anti-HBc positivity was noted among older age groups (Kasradze et al. 2020; Khetsuriani et al. 2023). Data on key populations such as people who inject drugs, migrant workers, and health-care workers are scarce and fragmentary, mostly derived from HCV-focused studies. Geographic equity challenges persist in ensuring timely birth-dose administration and consistent antenatal screening coverage in rural regions. At the programmatic level, the absence of a national treatment registry and limited interoperability between hepatitis and human immunodeficiency virus (HIV) information

systems impede comprehensive equity monitoring (Coalition for Global Hepatitis Elimination 2025; World Health Organization 2024). Overall, Georgia's achievements in pediatric control contrast with uneven progress in adult testing and treatment, emphasizing the importance of integrated and equitable health system approaches.

Discussion

This scoping review synthesized a decade of hepatitis B evidence in Georgia (2015–2025), mapping epidemiologic trends, prevention coverage, testing-treatment performance, and equity. The findings show remarkable achievements in childhood HBV control through sustained vaccination and PMTCT, contrasted with slower progress in adult diagnosis and treatment. These results reflect Georgia's transition from a vaccination-driven prevention phase toward the more complex challenge of chronic infection management among adults.

Comparison with regional and global evidence

Georgia's HBsAg prevalence of 2.7 % among adults aligns with the lower-intermediate range for the WHO European Region, where the median adult prevalence is approximately 1.6 % (World Health Organization 2024). The near-zero HBsAg prevalence among children (0.03 %) places Georgia among a small group of countries that have achieved the WHO target of ≤ 0.1 % prevalence in children under 5 years. This success parallels reports from Belarus and Kazakhstan, where long-standing high coverage of the hepatitis B birth dose and three-dose series have produced similarly low pediatric prevalence (World Health Organization 2024). The persistence of infection among adults, however, mirrors regional patterns where populations born before universal vaccination remain reservoirs of chronic HBV (Polaris Observatory Collaborators 2023).

The limited diagnosis (≈ 25 %) and treatment (≈ 5 %) coverage documented by national and partner reports (Tohme et al. 2024; Coalition for Global Hepatitis Elimination 2025) highlight a continuing gap across the WHO "90-80-65" elimination cascade. These values are comparable to or slightly below those reported for other upper-middle-income European countries, indicating the need for scale-up of testing within primary-care and harm-reduction services.

Interpretation of progress and barriers

High vaccine coverage and PMTCT integration have nearly interrupted vertical transmission, supported by strong cold-chain and maternal-child health infrastructure. In contrast, horizontal transmission in adulthood remains under-addressed. Barriers include the absence of a national HBV registry, limited availability of HBV DNA testing in peripheral laboratories, and low awareness among both clinicians and the public about antiviral eligibility criteria. Fragmentation between hepatitis, HIV, and general-practice information systems further constrains surveillance and monitoring of treatment outcomes.

Equity considerations

Although no major sex differences in infection prevalence were detected, inequities persist by geography and population group. Rural regions experience lower birth-dose timeliness and less access to confirmatory diagnostics, while data for key populations—such as people who inject drugs and migrants are scarce. Strengthening community outreach, integrating HBV screening into existing harm-reduction and reproductive-health programs, and ensuring equitable distribution of diagnostics are essential to align with WHO equity principles (World Health Organization 2022a, 2022b).

Policy implications

The evidence supports consolidating Georgia's hepatitis-control framework into a unified HBV elimination program complementary to its existing hepatitis C initiative. Priority actions include:

1. establishing a national HBV treatment and follow-up registry;
2. expanding routine adult HBsAg screening through primary-care, occupational, and antenatal platforms;
3. decentralizing HBV DNA and non-invasive fibrosis testing (e.g., transient elastography) to regional centers; and
4. integrating HBV indicators into the national health-information system to enable cascade monitoring.
   These steps would accelerate progress toward the WHO GHSS 2030 goals of 90 % diagnosis, 80 % treatment, and 65 % mortality reduction.

Limitations

As a scoping rather than systematic review, this study did not conduct formal quality appraisal or quantitative synthesis. Grey-literature sources, although authoritative, may under-report recent program data or duplicate information across agencies. Nevertheless, triangulating peer-reviewed and programmatic evidence provides a reliable overview of Georgia's HBV landscape and identifies clear data and policy priorities.

Conclusion

Georgia has achieved near-elimination of pediatric HBV infection through strong immunization and PMTCT programs. The next phase of elimination requires closing adult testing and treatment gaps, integrating equity monitoring, and strengthening national data systems. Sustained commitment and regional collaboration will be essential to reach the WHO 2030 hepatitis B elimination targets.

Table 1. Summary of hepatitis B indicators in Georgia, 2015–2025

Domain	Indicator	2015 baseline	2021–2025 value / status	Source(s)	Key comment
Epidemiology	HBsAg prevalence, adults ≥ 18 y	2.9%	2.7% (95% CI 2.3–3.4)	Kasradze et al. 2020; Khetsuriani et al. 2023	Stable intermediate prevalence
	HBsAg prevalence, children 5–17 y	–	0.03% (95% CI 0.0–0.19)	Khetsuriani et al. 2023	Near-elimination
Vaccination / PMTCT	HepB-BD coverage	93%	94–96% (2015–2024 range)	WHO/UNICEF (WUENIC) 2025[a]	Above WHO ≥ 90% target
	HepB3 coverage	96%	94–98% (2015–2024 range)	WHO/UNICEF (WUENIC) 2025[a]	Sustained high coverage
	Antenatal HBsAg screening	Pilot only	> 90% of facilities reporting	NCDC 2024	National scale-up
Testing–Treatment Cascade	Estimated chronic HBV cases	≈ 80,000	≈ 70,000	Tohme et al. 2024	Gradual decline
	Diagnosed	~15%	~25%	Tohme et al. 2024	Below WHO 90% target
	On antiviral therapy	~3%	~5%	CGHE 2025	Far below 80% target
Equity / Systems	National treatment registry	Absent	In development	CGHE 2025	Key data gap
	Timely birth dose (rural vs urban)	–	Lower in rural regions[b]	NCDC 2024	Equity challenge
	Data integration (HBV–HCV–HIV)	Partial	Not fully linked	WHO 2024	Limits surveillance

Note. HBsAg = hepatitis B surface antigen; HepB-BD = birth dose; HepB3 = three-dose series; PMTCT = prevention of mother-to-child transmission; CGHE = Coalition for Global Hepatitis Elimination; WUENIC = WHO/UNICEF Estimates of National Immunization Coverage.

[a] Ranges reflect annual coverage across 2015–2024; insert the exact latest year's value if the journal prefers a single point estimate.

[b] "Timely" = birth dose administered within 24 hours of birth.

ABBREVIATIONS

anti-HBc — Total hepatitis B core antibody

GHSS — Global Health Sector Strategies

HBIG — Hepatitis B immune globulin

HBsAg — Hepatitis B surface antigen

HBV — Hepatitis B virus

HCV — Hepatitis C virus

HIV — Human immunodeficiency virus

NCDC — National Center for Disease Control and Public Health

MMWR — Morbidity and Mortality Weekly Report

PMTCT — Prevention of mother-to-child transmission

WHO — World Health Organization

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