Strengthening timely hepatitis B birth dose vaccination in Uganda

Hepatitis B birth dose learning agenda

Country context

In 2022, Uganda's National Immunization Technical Advisory Group recommended adding the hepatitis B birth dose to the national immunization program, prompting the Ministry of Health to prioritize its introduction. By September 2025, the country launched a nationwide rollout co-financed by Gavi, the Vaccine Alliance and the Government of Uganda. The country aims to reach 75% coverage in the first year, ensure over 90% of facility births receive the dose by 2030, and reduce hepatitis B prevalence among children under 5 to below 0.5%. Yet timely hepatitis B vaccination within 24 hours has been challenging, especially for home births, and national coverage reached only 36% in 2024.

Village Health Team volunteers (VHTs) and Community Health Extension Workers (CHEWs) play key complementary roles in immunization—VHTs create demand and link households to services, while CHEWs coordinate and administer vaccines. The introduction of the electronic community health information system has improved data accuracy and service delivery for community health workers, though challenges such as limited coverage and connectivity remain.

To identify practical strategies for improving timely birth-dose vaccination, PATH collaborated with the Ministry of Health to assess learning questions on the feasibility, acceptability, cost and market access of innovative strategies to improve coverage for babies born at home or in health facilities.

Study design

The study included multiple methods, including a literature review, key informant interviews, focus groups, human-centered design workshops, and cost modeling of single versus multidose vial presentations.

Study sites included Lira District, a more urbanized area in northern Uganda with higher facility delivery rates (68%), and Butaleja, a rural district in eastern Uganda with fewer health facilities and lower facility delivery rates (47%). Data were collected through national-level interviews (n=18) with policymakers and technical experts to assess strategies for birth dose uptake and explore controlled temperature chain (CTC) feasibility; district and facility-level interviews (n=6 district-level officials, n=15 facility health care providers) to understand local implementation challenges and opportunities; and community-level interviews (n=12 mothers, n=4 traditional birth attendants) and focus groups (n=8) to identify barriers and facilitators for vaccine uptake within and outside of facility settings. UNICEF's Journey to Health and Immunization framework covering the caregiver and provider journey informed thematic analysis of barriers, facilitators, and implementation processes.

Three human-centered design workshops were held in Lira and Butaleja to co-create strategies for improving uptake. Workshop participants (n=70), including caregivers, community leaders, health workers, and district managers, validated key barriers, developed and refined prototypes, and prioritized feasible approaches for reaching newborns both in and outside facilities.

Findings

Current implementation strategies

Currently, the hepatitis B birth dose is administered in facilities alongside tuberculosis and oral polio vaccines, but there is no clear strategy for reaching newborns delivered outside health facilities—a critical gap given that an estimated 32% of women deliver at home. Activities are underway to strengthen health system readiness, including health worker training on Immunization in Practice guidelines updated with birth-dose-specific protocols and supportive supervision to ensure proper bundling practices, reduce wastage, and strengthen data monitoring.

About the hepatitis B birth dose learning agenda

With funding from Gavi, the Vaccine Alliance, PATH has employed a mixed methods approach to assess learning questions on the feasibility, acceptability, cost, market access, and impact of innovative strategies to improve timely hepatitis B birth-dose coverage for babies, whether born at home or in health facilities. By exploring innovative delivery strategies, assessing the role of community health systems, and understanding stakeholder perspectives, the project aims to identify scalable solutions. Evidence and insights from this initiative will help inform countries introducing the birth dose as well as those seeking new strategies to increase both coverage rates and timely administration.

This brief is a summary of the full case study available at www.path.org/who-we-are/programs/primary-health-care/hepb-birthdose.

Barriers and facilitators

Caregivers and health workers in Lira and Butaleja identified barriers including inconsistent immunization services, long travel distances, transport costs, cultural norms, and concerns about vaccine side effects. Systemic issues like stockouts, absence of vaccines in maternity wards, and limited staff training further reduce uptake despite mothers' preference for facility delivery.

Butaleja faces challenges such as fears of infertility, religious beliefs, and nighttime transport constraints, though women there had greater autonomy in vaccination decisions. In Lira, mothers relied more on antenatal care for information on vaccination but faced economic pressures necessitating a return to work soon after childbirth (and limiting care seeking for timely vaccination). Both districts experience facility-level barriers, but Butaleja struggles more with staffing shortages, lack of vaccine carriers, and limited outreach, while Lira's main issues stem from cold chain reliability and stockouts. These differences underscore the need for district-specific strategies.

Co-creation workshop insights

Following co-creation workshop activities and prototype refinement in Butaleja and Lira, participants identified priority implementation strategies for facility and out-of-facility settings. The prioritized strategies focus on improving timely vaccination through community engagement, integrating maternity and immunization teams, and ensuring consistent vaccine supply (Box 1). They also include improving community awareness and antenatal care counseling, strengthening coordination between VHTs/CHEWs and facilities, and equipping and motivating VHTs/CHEWs. The strategies were reviewed by Uganda's Viral Hepatitis Technical Working Committee and district stakeholders to ensure policy alignment and local adaptability.

Operational feasibility considerations

Supply chain

Uganda's vaccine supply chain effectively reaches remote communities through a hybrid system of static services and scheduled outreach, but this model is poorly aligned with the 24-hour timeliness recommendation for hepatitis B birth dose. Stakeholders emphasized that scaling timely delivery would require more frequent outreach, improved transport and real-time birth notifications, and strengthened cold chain capacity. Overall, they viewed financing stability, continuous vaccine availability, workforce readiness, and last-mile logistics as the primary constraints.

Controlled temperature chain

Stakeholders at all levels expressed openness to using controlled temperature chain (CTC) for the birth dose, with frontline providers especially optimistic that a 4- to 7-day CTC window could significantly improve timely vaccination for home births. National decision-makers, however, balanced these perspectives with concerns about training burden, product confusion, and long-term financing—leading to mixed views on policy adoption and willingness to pay.

BOX 1

Recommended strategies for increasing timely hepatitis B birth dose coverage in Uganda

Policy and systems

- ☑ National guidelines for timely hepatitis B birth dose delivery should be strengthened with clearer instructions on the recommended 24-hour timeliness window, and with defined responsibilities for maternity, neonatal, and immunization units to reduce missed opportunities.
- ☑ The birth dose should be embedded into routine maternal-newborn care workflows to ensure consistent vaccine availability across labor, maternity, postnatal, and special care baby units.
- ☑ Develop or implement policies to embed facility-based vaccination in maternity care, empowering nurses to administer hepatitis B birth dose in labor and delivery wards.
- ☑ Community-facility birth notifications should be formalized through VHTs, CHEWs, TBAs, and community leaders, supported by Electronic Community Health Information tracking and stronger accountability loops to improve rapid home birth identification and follow-up.

Knowledge and awareness

- ☑ Ongoing provider training and mentorship are needed to strengthen knowledge of hepatitis B transmission, timely immunization, cold chain requirements, and effective caregiver communication.
- ☑ Caregiver education and community engagement should be expanded through antenatal care platforms, community gatherings, and influential family and religious leaders to address cultural barriers and misconceptions.

Service delivery

- ☑ Supply chain and product policy should reflect delivery realities by pairing multidose vials in high-volume facilities with single-dose formats for low-volume and outreach settings, and by using a carefully managed 4- to 7-day CTC window (for CTC-approved vaccines) to extend reach for out-of-facility births.
- ☑ While national policymakers are hesitant to authorize CHEWs to vaccinate newborns, provider support suggests value in implementation research to assess the feasibility, acceptability, cost, and impact of enabling CHEWs to deliver the birth dose in community settings.
- ☑ Monitor timely hepatitis B birth dose coverage (within 24 hours) to assess performance, provide targeted support, and learn and improve.
- ☑ Plan for further local adaptation of hepatitis B birth dose delivery strategies.

Overall, respondents saw CTC as helpful but insufficient on its own, emphasizing that successful introduction would require clear guidelines, supervision, and alignment with existing outreach and postnatal care workflows.

Product presentation

Cost modeling based on Uganda's vaccine procurement and delivery costs confirm that one-dose vials have better value for money for home-based delivery, given the lower wastage rate compared to current policy that discards remaining doses in open vials taken for outreach. For facility-based delivery, the presentation that provides better value for money depends on the number of births in the facility's catchment area, with one-dose vials providing better value for money in facilities with lower volume (fewer than five births per month), and ten-dose vials better value for money in higher volume facilities.

Stakeholders at all levels agreed that hepatitis B birth dose vaccine presentation should be tailored to delivery context, with strong preference for single-dose formats (including future options for microarray patches and prefilled syringes) for outreach and lower-volume facilities, where they reduce wastage, simplify preparation, and improve caregiver acceptance. Within facility settings, product presentation views were more mixed: national and district stakeholders weighed cost and storage efficiency against contamination and wastage risks, while frontline providers prioritized ease of use and infant comfort. Overall, respondents supported a fit-for- purpose strategy rather than a one-size-fits-all approach, noting limited feasibility for managing multiple formats concurrently, especially during outreach.

Policy and program implications

Key implications

Learnings from this research have significant implications for national policy and program development as Uganda transitions from introduction of hepatitis B birth dose to sustained scale-up with Gavi's support (Box 1). Insights gained can guide updates to national guidelines, training curricula, and financing decisions, ensuring the integration of birth dose delivery within Uganda's maternal, newborn, and child health and primary health care systems. Lessons learned can inform development of clear terms of reference for the Viral Hepatitis Technical Working Committee to integrate the birth dose within a comprehensive vertical elimination strategy, connecting vaccination, maternal screening, and treatment pathways. Findings can also guide a national communication strategy for the birth dose that addresses cultural norms related to newborn confinement, fears regarding vaccination pain, and misconceptions and concerns about vaccine safety.

BOX 2

Opportunities for continued learning through implementation research

- **Pilot, refine, and institutionalize** the prioritized co-created strategies by conducting implementation research the two study districts to test operational viability, acceptability, cost-effectiveness, and impact—particularly for strategies targeting newborns delivered at home.
- **Examine the performance of VHTs and CHEWs** in supporting real time birth notification.
- **Assess integrated maternity-immunization workflows** to determine whether they reduce missed birth-dose vaccinations.
- **Assess the optimal use of mixed (one- and ten-dose) vaccine presentations** for specific delivery contexts, quantifying settings where CTC adds the most value and evaluating CTC-approved vaccines' impact on timely coverage. Future studies could also explore feasibility and acceptability of microarray patch administration by community health workers.

Opportunities for implementation research

The study highlights several opportunities for further implementation research (Box 2). Priority next steps include piloting, refining, and institutionalizing the prioritized strategies developed through co-creation, beginning with research in the two study districts to assess feasibility, cost, and impact. Key questions include how effectively VHTs and CHEWs support real-time birth notification, whether integrated maternity-immunization workflows reduce missed opportunities, and how product presentation influences wastage and provider practices.

Enhancing data systems

Data systems can be enhanced to monitor hepatitis B birth dose coverage and timeliness, facilitating evidence-based decision-making for scaling operations. The Ministry of Health and its partners should leverage existing digital health investments by integrating birth dose indicators into the Electronic Community Information System and DHIS2, facilitating routine monitoring of coverage and timeliness to address an existing national data gap.

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