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Liberia's expanded programme on immunisation: A critical and interpretative review of immunisation social behavioural change communication challenges and opportunities

Musu Deshield Mitchell[1], Evans Lablah[1], Abebe Kassahun Afework[1], Alice Peters[1], Amadu Bah[2], Yuah Nemah[2], Lasse Colee[2], Godfrey Musuka[1,✉]

[1]UNICEF, Monrovia, Montserrado County, Liberia, [1]Ministry of Health, Monrovia, Montserrado County, Liberia

✉Godfrey Musuka, UNICEF, Monrovia, Montserrado County, Liberia
| Email: gnmusuka@hotmail.com | ORCID: 0000-0001-9077-4429

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Abstract

This desk review presents a critical, interpretative assessment of Liberia's Expanded Programme on Immunisation (EPI), focusing on identifying behavioural, systemic, and governance determinants that shape vaccine uptake and delivery. The analysis draws from government strategies, peer-reviewed literature, and grey reports to map the evolution of EPI within Liberia's fragile post-conflict health context. Using the Walt and Gilson Health Policy Triangle and the Critical Interpretive Synthesis, the study highlights fragmented coordination, limited use of behavioural evidence, weak integration of Social and Behaviour Change (SBC) frameworks, and persistent inequities in access. Findings underscore the need for a shift from campaign-driven outreach to institutionalised, evidence-based SBC systems embedded within national and county health structures. Policy implications emphasise strengthening behavioural data systems, investing in cross-sector SBC capacity, and formalising governance mechanisms linking EPI, the Health Promotion Division, and local actors. The paper proposes an actionable roadmap for integrating behavioural science into Liberia's immunisation system to improve coverage, resilience, and public trust.

Keywords: Liberia, social behaviour change, immunisation, health communication, vaccination, West Africa

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Introduction

Liberia has made commendable progress in strengthening its national immunisation program, with sustained political commitment and collaboration among government, development partners, and community actors [1]. The Expanded Programme on Immunisation (EPI) has contributed significantly to reducing vaccine-preventable morbidity and mortality among children and women of reproductive age [2]. However, despite these achievements, wide disparities persist across counties and population groups [3]. Pockets of low coverage, driven by socio-cultural beliefs, misinformation, logistical constraints, and uneven health-service access, continue to undermine national immunisation targets [4-6].

The Liberian health system operates within a complex post-conflict recovery environment, characterised by fragile infrastructure, limited fiscal space, and persistent human-resource shortages [7]. Periodic public-health emergencies, including the 2014–2016 Ebola epidemic and subsequent outbreaks of measles and Coronavirus disease 2019 (COVID-19), have exposed systemic vulnerabilities and disrupted routine immunisation services [5, 8, 9]. These shocks have constrained service delivery and deepened behavioural and structural barriers to vaccine uptake. Consequently, national immunisation gains remain fragile, particularly in rural and underserved communities.

Social and Behaviour Change (SBC) approaches offer a vital, evidence-informed mechanism for addressing these behavioural and demand-side challenges [10, 11]. SBC frameworks emphasise the interplay between individual decision-making, social norms, institutional trust, and communication ecosystems [12]. When effectively implemented, they enhance public confidence, counter misinformation, and promote sustained health-seeking behaviour. Within Liberia's immunisation context, an SBC lens provides a pathway to design culturally responsive, community-anchored interventions that complement supply-side investments.

Recognising these imperatives, UNICEF Liberia, in collaboration with the Ministry of Health and development partners, seeks to develop a comprehensive SBC Strategy for EPI. The first stage of this process involves a critical and interpretative desk review. This report will present the methodology and findings of a systematic synthesis of behavioural, socio-cultural, and programmatic evidence to inform strategic planning. By reviewing existing literature, policy documents, and program reports, this review will develop an integrated understanding of the behavioural determinants of vaccine uptake at the national, county, and community levels.

Ultimately, the review aims to provide actionable insights to support the design of Liberia's SBC Strategy for Immunisation, one that strengthens trust, promotes equitable access to services, and enhances community ownership of immunisation outcomes. This review critically analysed current behavioural, socio-cultural, and programmatic evidence affecting immunisation uptake in Liberia.

Methods

This review adopted a critical and interpretative approach [13] desk review design to synthesise evidence on the behavioural, socio-cultural, and systemic determinants influencing immunisation uptake in Liberia. The review combined systematic document analysis with targeted stakeholder consultations to triangulate insights across academic, institutional, and practitioner-generated evidence. This approach enhanced analytical validity and reduced bias, yielding a nuanced understanding of behavioural drivers, communication dynamics, and system-level enablers of demand creation within Liberia's EPI.

The analysis followed an iterative, theory-informed approach aligned with the objectives of UNICEF and the Ministry of Health's ongoing efforts to develop an SBC Strategy for immunisation. Triangulation across multiple evidence sources ensured that the findings reflected both the formal policy architecture and the community realities shaping vaccine demand and service uptake.

Critical and interpretative review

The critical and interpretative review followed the PRISMA extension for scoping reviews (PRISMA-ScR) guidance [14]. The review targeted English-language literature and grey documents published between 2010 and 2025 relating to immunisation, vaccine demand, and SBC in Liberia and comparable West African contexts.

Sources included peer-reviewed publications, national policies, programmatic evaluations, donor reports, and strategy documents from UNICEF, WHO, GAVI, USAID, and the Ministry of Health. Searches were conducted in PubMed, Scopus, Web of Science, and Google Scholar, complemented by targeted searches of institutional repositories, including ReliefWeb, WHO IRIS, UNICEF publications, and the Liberia Ministry of Health website.

Search strings combined terms such as "Liberia" AND ("immunisation" OR "vaccine coverage" OR "EPI" OR "SBC" OR "behaviour change communication" OR "community engagement" OR "vaccine hesitancy" OR "health promotion" OR "routine immunisation" OR "trust" OR "misinformation" OR "demand generation").

Screening and selection

All retrieved records were managed in EndNote X9 for deduplication. Screening followed predefined inclusion and exclusion criteria, focusing on documents that

examined behavioural determinants, community engagement, or communication strategies related to immunisation in Liberia.

The inclusion criteria encompassed:

- National policies, strategies, or reports related to immunisation or health promotion.
- Studies on behavioural or social factors affecting immunisation demand.
- Evaluations of community engagement or communication interventions; and
- Grey literature reflecting programmatic experiences from partners or subnational settings.

Data extraction and thematic analysis

A structured data extraction matrix was developed, aligned with the thematic domains of the review:

1. National level – policy frameworks, coordination mechanisms, financing, and communication infrastructure.
2. County level – health service delivery, workforce capacity, logistics, and supervision.
3. Community level – behavioural determinants, socio-cultural influences, gender norms, trust, misinformation, and interpersonal communication.

Documents were coded using a mixed inductive–deductive approach, allowing emergent themes to complement predefined categories from UNICEF's SBC Theory of Change. [15] and Behavioural Drivers Model (BDM) [16].

Analytical framework

The review applied a triangulated analytical design, integrating three complementary conceptual frameworks:

1. UNICEF's Behavioural Drivers Model (BDM) [16] – to examine cognitive, social, and structural factors influencing immunisation uptake.
2. Complex Adaptive Systems (CAS) theory [17] – to understand how behavioural determinants interact dynamically with system constraints and community feedback loops in fragile or resource-limited contexts.
3. Health Policy Triangle (Walt Gilson) [18] – to analyse actor relationships, power dynamics, and contextual influences shaping EPI implementation and communication strategies.

Together, these frameworks supported a layered interpretation linking policy intent with behavioural realities and guided the development of a conceptual SBC framework for Liberia's immunisation programme.

Results

The search retrieved a total of 92 records. After removing 25 duplicates, 67 unique documents were screened at the title and abstract levels. Of these, 52 records were excluded for not meeting the inclusion criteria, mainly due to a lack of behavioural or SBC relevance, a lack of Liberia-specific focus, or insufficient empirical content. A final set of 15 full-text documents was retained for detailed analysis. These included four publications [4, 19-21], one master's thesis [22], one policy brief [23], one Ministry of Health comprehensive multi-year plan [24], one GAVI report [25], one WHO report [26] and six grey literature records [25, 27] (Table 1).

Of the 15 included documents, 11 addressed behavioural determinants of immunisation demand, such as knowledge, risk perception, trust in the health system, gender norms, socio-cultural influences, and communication channels [4, 19-27]. Four focused primarily on EPI policy, planning, or strategy, covering national communication frameworks, strategic planning, and priority setting for SBC in EPI [24, 25, 27, 28]. Three examined service delivery, routine immunisation implementation, and community engagement, including the role of community health assistants and campaign mobilization [19, 20, 26]. Two focused on health communication or risk-communication interventions during outbreaks or emergencies [25]. Two explicitly addressed misinformation, rumours, and social media narratives as barriers to vaccination [4, 23]. Two addressed gender, equity, and inclusion considerations in immunisation [29]. Two were programme evaluations or donor/implementer technical reports. [25, 26]. More details on the characteristics and key findings of the included articles are presented in Table 1.

National level findings: Policy, coordination and financing

At the national level, Liberia's immunisation programme is guided by several strategic and policy documents that reference community engagement, SBC, and behavioural approaches. The EPI Comprehensive Multi-Year Plan [24] outlines communication and demand creation activities for routine immunisation but presents them primarily as stand-alone components rather than systematically integrated across planning, monitoring, and budgeting [24].

The Draft EPI Communication Strategy (2018) expands on this by proposing messaging and audience segmentation, yet implementation structures and costing remain unclear [28]. The National Social and Behaviour Change Strategy (2023–2025) acknowledge behavioural barriers and emphasize coordination and community participation beyond mass media [27].

Coordination structures are established through inter-agency coordinating committees and technical

Table 1. Characteristics of included articles

Author, Year	Type	Geographic Scope	Study / Document Objective	Level of Analysis	Key Findings / Evidence
Ministry of Health Liberia, 2016	MoH Strategy	Liberia (national)	Provide a medium-term strategic plan to reduce VPD morbidity/mortality and reach ≥90% RI coverage, introduce vaccines, strengthen systems.	National programme review	Coverage improved pre-EVD then declined; recovery post-EVD. Strong SIAs, cold chain expansion, revised AEFI guidelines.
Gavi, 2022	Dialogue Report	Liberia (national; counties)	Assess EPI performance during COVID-19 and develop recovery roadmap.	National programme review	Declines in Penta3 and MCV1; outbreaks reported; vaccine hesitancy; mobile payments introduced; HSS funds reallocated.
WHO AFRO, 2022	Experience Report	Liberia – 15 counties	Review COVID-19 vaccination rollout and lessons learned.	National operational review	Slow initial rollout; improved with county-led approach; ~54% fully vaccinated by July 2022.
Bedford J et al., 2017	Journal Article	Four counties	Assess community engagement in post-Ebola immunisation campaign.	Campaign evaluation	>99% coverage; trust rebuilt via community leaders; interpersonal communication effective.
Sanvee-Blebo LM et al., 2024	Journal Article	Montserrado	Nimba	Estimate COVID-19 vaccine hesitancy and determinants. & Community-based analysis	29.1% hesitancy; higher in urban areas; safety concerns dominant.
Mantus G et al., 2023	Journal Article	Grand Bassa County	Assess household clustering of vaccine acceptance.	Household & individual	53% hesitant; household influence strong; education linked to acceptance.
Seydou A, 2021	Policy Brief	West Africa	Assess vaccine acceptance and trust in government.	Cross-country analysis	Low acceptance in Liberia (33%); mistrust strongly linked to hesitancy.
Dovillie, N.K	Master's Thesis	Margibi County	Identify factors affecting immunisation post-Ebola.	County	Fear and facility closures reduced immunisation uptake.
Barrow et al., 2023	Journal Article	Cross-country	Examine childhood vaccination uptake.	Comparative	Low vaccination prevalence; influenced by parental education and care access.
MoH Liberia, 2023	Strategy	National	Framework for social and behaviour change.	National	High awareness but logistical barriers and socio-cultural norms persist.
MoH Liberia Draft EPI Strategy	Strategy	National	Improve immunisation demand and trust.	National	Coverage uneven; limited understanding of VPDs.
Gender Barriers Review, 2023	Report	National	Assess gender barriers in immunisation.	National	Women key but lack decision power; access barriers persist.
Last Mile Health	Report	National	Assess gender equity in community health.	National	Only 17% workforce female; gender norms limit participation.
EPI Risk Communication Survey	Report	County	Assess perceptions and misinformation.	Community	High hesitancy; misinformation common; radio key information source.
MoH Liberia, 2025	Report	Six counties	Community engagement field visits.	County	Town halls identified behavioural and access barriers affecting uptake.

working groups, providing platforms for decision-making and partner alignment. However, SBC and community engagement responsibilities are fragmented between the EPI Unit, the Health Promotion Division, and partners, leading to duplication, inconsistent messaging, and weak feedback loops from counties to the national level. The county planning and supervision templates reviewed provide limited space to document SBC indicators, interpersonal communication activities, or community feedback. Gender-responsive monitoring is also weak: while gender is referenced as a principle, immunisation tools do not routinely capture male participation or social barriers [24].

Financing for SBC remains heavily donor-dependent. The Gavi report shows that communication, interpersonal outreach, printing of materials, and community mobilisation are primarily externally funded [25]. Government budget lines for SBC are minimal and often vulnerable to reallocation during emergencies or in response to competing priorities. Conversely, emergency investments, such as those during Ebola and COVID-19, enabled the rapid scale-up of community engagement, radio programming, and risk-communication structures, but these gains have proved difficult to sustain in routine programming. [19, 25].

Across documents, a consistent lesson emerges: policies and structures exist, but SBC, community engagement, and gender responsiveness are insufficiently institutionalised

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and inadequately financed. SBC remains dependent on partner projects rather than embedded in national budgets, systems, and routine accountability mechanisms (Table 2).

County-level findings: service delivery and system enablers

County-level performance shows persistent disparities in routine immunisation linked to service readiness, community trust, and behavioural determinants. Multiple documents highlight that coverage gains achieved pre-EVD were unevenly restored post-EVD, and hard-to-reach counties continue to lag [24, 28]. According to the Ministry of Health, although Penta3 rose to 89% in 2013, coverage fell sharply to 63% during the EVD outbreak, with recovery still uneven across counties despite cold-chain expansion and partner support [24].

Several included reports show that county-level system constraints directly reinforce behavioural barriers. GAVI and the WHO regional office for Africa report that stockouts, outreach suspension, and logistical delays reduced access to services, particularly in hard-to-reach areas [25, 26]. According to the Ministry of Health, facilities in remote counties face poor road networks and distance challenges, with up to 29% of the population living >5 km from a facility and cold chain reliability varies by location [24]. Public health emergencies exacerbate these challenges. During COVID-19, counties reported service suspensions, travel restrictions, and cancelled outreaches, contributing to declines in Penta3 (−14pp) and MCV1 (−16pp) [25]. During the COVID-19 deployment, stockouts at county depots, payment delays, and transport shortages disrupted microplanning and slowed uptake early in the rollout [26].

According to the reviewed sources, human resources and role clarity are recurring system gaps at the county level. The Draft EPI Communication Strategy (2018) and the Gender Barriers Report (2023) indicate that social mobilisation is typically handled by county EPI officers rather than by dedicated SBC focal persons. Counties lack structured gender-responsive mobilisation, despite evidence that decision-making power within households influences uptake [4]. The Last Mile Health Gender Assessment (2022) confirms that the community health workforce is 83% male, limiting female-to-female interpersonal counselling in some conservative communities [29].

A 2025 community engagement report covering activities in Montserrado, Margibi, Bong, Nimba, River Gee, and Maryland counties showed that communities face a complex mix of behavioural, social, and structural challenges that influence immunisation uptake. Caregivers, especially young and teenage mothers, demonstrated limited knowledge of the immunisation schedule, low awareness of side-effect management, and reduced perceived risk of vaccine-preventable diseases [27]. Rumours such as "vaccines make children sick," fears of overdose when doses are missed, and anxiety linked to redness, fever, or swelling were widespread. These behavioural determinants were compounded by structural barriers, including illicit charges for vaccination cards, long distances to facilities, transport costs, stockouts, limited vaccinators, long waiting times, and facilities' refusal to open vials until target numbers were reached. Fear of ritualistic killings, community fines for home births, and norms encouraging caregivers to wait for outreach instead of visiting facilities further constrained access. Despite these barriers, the report identified several enablers that can strengthen an SBC strategy, including male involvement, support from grandparents, community mobilisation by leaders, encouragement from TTMs, and proactive reminders from CHAs. Facilities that prioritised infants, improved provider attitude, communicated stockouts clearly, or posted signs reminding families that vaccines are free saw increased trust and attendance [27].

The findings also highlighted several communication and SBC approaches already used or recommended, including dialogue-based community meetings, radio messaging, SMS reminders, daily facility health talks, and stronger collaboration among TTMs, CHAs, and community leaders. However, significant gaps remain, including service-quality issues consistently undermining demand-generation efforts, and rumour management is reactive rather than systematic [27]. The report noted limited targeted engagement for fathers and adolescent caregivers, inconsistent outreach schedules, and inadequate two-way communication between facilities and communities [27]. These insights emphasise the need for a more responsive, coordinated, and community-centred SBC strategy, one that links social and behaviour change to service quality, strengthens rumour management systems, improves provider–client communication, and recognises the social norms, economic pressures, and community structures that influence immunisation behaviours (Table 2).

Multiple county or community-level reports confirm that behavioural barriers intensify when service delivery falters. The EPI Risk Communication Survey (2020) found widespread misinformation and fear of attending health facilities due to COVID-19, especially where outreaches were suspended [25]. Dovillie (2016) similarly showed that facility closures and low trust post-EVD reduced childhood immunisation in Margibi County [22].

Household-level and social norm effects are also strongest at the sub-national level. Mantus et al. (2023) show that in rural Grand Bassa, vaccine acceptance is "socially contagious" within households, and interpersonal exposure via CHAs increases uptake [20]. Bedford et al. (2017) found that trust in local leaders and mothers as mobilisers was essential for campaign success, with counties achieving >99% coverage when community-level dialogue

Table 2. Key SBC barriers, enablers, gaps and lessons to immunisation in Liberia

Author, Year	Behavioural Determinants Identified	Barriers to Immunisation	Facilitators / Enablers	SBC or Communication Approaches	Gaps / Lessons for SBC Strategy
MoH Liberia, 2016	Low caregiver knowledge; low male involvement; reliance on radio; weak counselling; myths/rumours	Hard-to-reach terrain; HR gaps; EVD disruption; cold chain gaps; surveillance issues	Strong governance; partner support; expanded cold chain; integrated campaigns	Advocacy, community mobilisation, radio + digital platforms, interpersonal communication	Need stronger counselling, myth control, rural outreach, defaulter tracking
Gavi, 2022	Hesitancy, misinformation, low trust, weak counselling	COVID disruptions; funding/logistics issues; outreach gaps	Partner support; mobile payments; cold chain expansion	Radio campaigns; CSO engagement; community leaders	Sustain confidence, improve tracking, equity focus
WHO AFRO, 2022	Hesitancy, misinformation, fear of side effects	Stockouts; transport issues; delayed payments; poor access	Decentralised planning; mobile teams; leadership engagement	Community radio; school outreach; leader engagement	Strengthen supply, data systems, and trust
Bedford et al., 2017	Post-Ebola mistrust; reliance on community voices	Rumours; distrust; confusion with Ebola vaccines	Community leaders; CHVs; trusted influencers	Door-to-door, community dialogues, radio dramas	Need continuous engagement and trust building
Sanvee-Blebo et al., 2024	Knowledge gaps; misinformation; urban hesitancy	Fear of side effects; misinformation	Trusted media; healthcare workers	Targeted messaging; community dialogue	Improve safety communication; audience segmentation
Mantus et al., 2023	Social norms; household influence	Misinformation; low education; distance	Education; CHAs; community role models	Household-level engagement; CHAs mobilisation	Focus on households and women's education
Seydou, 2021	Low trust; religious beliefs; misinformation	Mistrust; low risk perception	Trusted leaders; religious influencers	Faith-based engagement; transparent messaging	Address trust deficits and misinformation
Dovillie, N.K	Fear, misinformation, social pressure	Access challenges; staffing gaps	Education; vaccination awareness	Community communication programs	Limited SBC-specific recommendations
Barrow et al., 2023	Media exposure; education; health service contact	Low ANC visits; low education; rural access issues	PNC attendance; media exposure	Community awareness strategies	Limited behavioural data
MoH SBC Strategy, 2023–2025	Trust, norms, accessibility, poverty	Misinformation; access barriers	High awareness; CHAs; leadership support	IEC materials; counselling; community dialogue	Weak M&E; limited resources
MoH Draft EPI Strategy	Trust; social influence; gender norms	Misinformation; weak systems	CHAs; radio platforms	Strengthen community communication	Weak SBC monitoring
Gender Barriers Review, 2023	Gender norms; decision-making power	Distance; lack of male support	Male engagement; women's groups	Gender-sensitive communication	Gender not integrated in planning
Last Mile Health	Gender norms affecting workforce	Male-dominated workforce	Community engagement	Promote female participation	Need gender-sensitive reforms
EPI Risk Communication Survey	Knowledge, perceptions, trust	Fear; misinformation; service disruptions	Trusted information sources	Radio; CHWs; local leaders	Need emergency preparedness
MoH Liberia, 2025	Low knowledge; fear; misinformation; social norms	Structural, behavioural, and economic barriers (fees, distance, stockouts, rumours)	Community leaders; CHAs; improved service quality	Town halls; radio; SMS reminders; community dialogue	Service quality issues undermine demand; weak communication systems

was prioritised [19].

Across these reports, behavioural data are rarely captured in routine county reports. DHIS2 tracks doses and dropout rates, but not caregiver concerns, misinformation, male involvement, or gender norms [27, 28]. As a result, behavioural bottlenecks remain invisible in monthly county reviews, undermining proactive mitigation (Table 2).

Community-level findings: Behavioural and social determinants

At the community level, behavioural and social determinants strongly influence routine immunisation uptake and completion. Evidence from Liberia consistently shows that vaccine attitudes are shaped less by biomedical knowledge than by trust, gender norms, social influence, and service experience [4, 19, 20].

Firstly, regarding trust and confidence in vaccines and the health system, our review findings show that trust fluctuates in response to service reliability, prior crisis experiences, and the credibility of information sources.

Following the Ebola epidemic, fear of health facilities and rumours about contamination contributed to lower care-seeking behaviour [22]. During COVID-19, misinformation about infertility and foreign vaccines spread rapidly through social networks and local radio [23, 28, 25]. Campaign evaluations show that where local leaders were involved, and caregivers received interpersonal counselling, confidence increased and coverage exceeded 99% [19].

Second, the reviewed documents highlighted the influence of gender roles and household decision-making. Immunisation decision-making is rarely a matter of individual maternal choice. Sanvee-Blebo et al. (2024) [4] show that male partners and elders exert significant authority over whether a child is vaccinated. In some settings, mothers may require approval or accompaniment from the male head of household to travel to facilities. The Last Mile Health Gender Assessment (2022) also shows the community health workforce is 83% male, reducing opportunities for sensitive female-to-female dialogue about vaccination [29].

Third, social norms, influence networks, and community engagement were also discussed across various sources. Vaccination behaviours are socially patterned. Mantus et al. (2023) found that uptake is "socially contagious within households," and interpersonal exposure through CHAs significantly increases acceptance [20]. Informal community structures, such as maternal groups, savings clubs, and religious networks, are strong influencers but are underutilised for routine immunisation [29]. Mobilisation tends to be episodic and campaign-driven, rather than sustained [28].

Fourth, service experience and perceived respect from health workers emerged as important determinants. Perceptions of how caregivers are treated shape their willingness to return for follow-up doses. Poor staff attitude, lack of time to answer questions, and stockouts reduce motivation and increase dropout [22]. Communities interpret stockouts or cancelled outreach as evidence that vaccination is unimportant or unreliable, thereby eroding confidence.

Fifth, information flow and feedback mechanisms were also highlighted as key determinants. According to the Ministry of Health, there is a limited formal mechanism for structured two-way communication between communities and facilities. The 2016–2020 strategy reviewed addressed this challenge. Feedback from caregivers typically reaches county or national teams only through partners or ad hoc reporting. [27]. General CHVs and CHAs are the primary bridge between facilities and households, yet many lack adequate SBC training, job aids, or incentives to counsel caregivers effectively [28, 30]. More details are presented in Tables 2 and 3.

Conclusively, this review revealed that community trust and vaccine demand are not only shaped by beliefs but also by how communities are engaged, respected, and heard. Behavioural determinants are deeply embedded in gender norms, social networks, and lived experiences with the health system.

Cross-cutting insights

Using UNICEF's Behavioural Drivers Model (BDM), we found consistent behavioural deficits across levels, particularly trust gaps, misinformation, and gendered decision-making, that are insufficiently captured in routine monitoring and planning [4, 24, 27-29]. Applying CAS shows the programme adapting in an ad-hoc, donor-dependent way, where counties innovate as exemplified by mobile outreach, radio outreach, but learning is not institutionalised, and feedback loops are weak [20, 25, 26]. The Health Policy Triangle highlights power/actor gaps and unclear mandates between EPI and Health Promotion, producing fragmented SBC leadership and financing [24, 25, 28].

Together, the frameworks indicate three linked problems: (1) behavioural drivers persist and are under-measured; (2) systems are fragmented and reactive rather than learning-oriented; and (3) SBC remains largely campaign/partner-driven and under-financed for routine, sustained engagement. Priority actions are therefore to institutionalise SBC leadership and budgets at the national and county levels [24, 27], add behavioural indicators into DHIS2 and monthly reviews [20, 28], professionalise CHAs/ general CHVs with SBC training and incentives [20, 29], and invest in social listening & real-time feedback loops to turn community signals into programmatic adaptation [25].

Discussion

This critical and interpretative desk review reveals that Liberia's EPI stands at a strategic inflexion point, shifting from a primarily campaign-oriented model toward a more sustainable, system-embedded approach to SBC. Despite significant progress in national immunisation coverage since 2015, behavioural and systemic bottlenecks continue to impede equitable vaccine uptake. These include persistent trust deficits, gender-based decision hierarchies, limited coordination between the HPD and EPI Unit, and a heavy reliance on donor-driven communication cycles.

The findings affirm that effective immunisation demand generation in Liberia cannot be addressed through isolated awareness campaigns alone. Instead, it requires a whole-of-system behavioural approach that integrates SBC into every stage of policy, planning, service delivery, and community engagement.

Table 3. Triangulated multi-framework analysis of behavioural and system determinants of immunisation delivery

Framework	Analytic approach	Key national-level findings	Key country-level findings	Key community-level findings	Cross-cutting interpretation & priority actions
UNICEF Behavioural Drivers Model (BDM)	Thematic coding of behavioural determinants (knowledge, trust, social norms, enabling environment)	SBC elements exist in policy but are not systematically operationalised; gender referenced but not implemented	Counties lack SBC focal persons; only coverage metrics tracked; behavioural indicators absent in DHIS2 and reviews	Trust, misinformation, gender norms, and social contagion influence uptake	Behavioural drivers under-measured; need integration into M&E and budgets. Actions: add BDM indicators to DHIS2; fund SBC; use audience segmentation
Complex Adaptive Systems (CAS) Theory	Mapping system behaviours, feedback loops, and adaptive responses	Adaptive responses exist but are donor-dependent; limited institutional learning	Local innovations (mobile teams, radio, PIRI, mobile payments) exist but are uneven and not scaled	Communities adapt through social networks; CHAs act as key connectors but lack resources	System adapts without structured learning. Actions: institutionalise learning cycles; scale innovations; establish real-time feedback systems
Health Policy Triangle (Walt & Gilson)	Actor mapping and policy implementation gap analysis	Clear SBC policy intent but unclear roles; donor-dependent financing	Decentralisation exists but counties lack resources; partner-driven implementation leads to inconsistency	Community actors are influential but under-resourced and poorly integrated	Policy-practice gap due to unclear roles and financing. Actions: define SBC leadership, allocate budgets, strengthen coordination and accountability

Structural and institutional implications

At the policy and governance level, the analysis demonstrates that SBC functions remain structurally fragmented. The HPD, EPI Unit, and Communication Working Group each lead discrete activities with overlapping mandates, resulting in duplication and weak accountability. These governance gaps mirror findings from other fragile health systems, where vertical programming and donor dependence have historically undermined national ownership and system integration [30].

To operationalise a coherent SBC system for immunisation, Liberia must move toward a functional coordination model anchored in clear institutional roles, joint planning frameworks, and shared accountability indicators between HPD and EPI. Establishing a National SBC Technical Working Group for Immunisation, supported by a harmonised operational roadmap, could enhance leadership coherence, streamline partner engagement, and ensure sustained investment in behavioural insights.

Furthermore, financing mechanisms for SBC remain highly donor-dependent, with minimal domestic allocation. As global partners gradually transition to co-financing models, Liberia must embed SBC budgeting within its national EPI and Primary Health Care (PHC) plans. Without predictable domestic financing, SBC interventions risk remaining episodic and reactive, constrained by project-based funding cycles.

Recurring themes included low caregiver confidence, limited male engagement, inconsistent community mobilisation structures, weak last-mile communication, and dependence on donor-funded outreach and social mobilisation activities. Stakeholders emphasised that, while Liberia's EPI benefits from strong political commitment and alignment with global immunisation agendas, SBC functions remain fragmented, under-resourced, and insufficiently integrated into programme design.

Stakeholder consultations also underscored persistent trust deficits, especially in peri-urban and border communities, where misinformation, rumours, and service delivery inconsistencies shape perceptions of vaccines. Respondents highlighted that community engagement mechanisms, including general community health volunteers (gCHVs), community health assistants (CHAs), religious leaders, and mothers' groups, operate unevenly across counties, with limited coordination and supervision. At the same time, stakeholders identified emerging opportunities such as the revitalisation of the HPD, the development of the national SBC strategy, the growing presence of community radio and mobile platforms, and renewed government emphasis on routine immunisation integration within primary healthcare. Overall, the stakeholder inputs validated the desk review findings and added operational depth, illuminating how behavioural barriers, gender norms, and systemic inefficiencies converge to shape vaccine demand, trust, and equity in coverage.

Behavioural and community engagement implications

The findings highlight that behavioural determinants, trust, social norms, gender relations, and risk perception are central to understanding Liberia's immunisation challenges. Misinformation, often propagated through interpersonal

networks, is reinforced by inconsistent communication among health workers and service quality issues. This aligns with the UNICEF BDM, which emphasises the interplay between cognitive, social, and environmental influences on health behaviours [16].

To address these barriers, Liberia's SBC strategy should prioritise trust-building interventions, moving beyond one-way messaging toward dialogue-based, participatory communication. Evidence from comparable settings suggests that community engagement is most effective when frontline actors, community health assistants (CHAs), general community health volunteers (gCHVs), traditional leaders, and women's associations, are empowered as co-creators of health messaging rather than passive implementers.

Integrating gender-transformative approaches into EPI-SBC programming is equally critical. Interventions must recognise the role of male decision-makers in immunisation uptake while promoting shared caregiving responsibility. SBC packages should explicitly address gender norms through male involvement campaigns, couple dialogues, and targeted interpersonal communication for fathers and elders.

Systems integration and data use

Weak integration of behavioural data into national monitoring frameworks represents a key missed opportunity. Routine information systems, such as DHIS2, primarily capture service delivery metrics but exclude behavioural indicators, including caregiver trust, perceptions of vaccine safety, and satisfaction with services. This constrains the system's ability to monitor demand dynamics or evaluate the impact of communication interventions.

Embedding behavioural indicators into the EPI dashboard, aligned with Health Management Information System (HMIS) tools and monthly review templates, would allow decision-makers to track progress on both supply and demand fronts. Similarly, strengthening social listening systems, using mobile platforms and community radio feedback loops, can provide near-real-time insights into community sentiment, misinformation trends, and barriers to service utilisation.

Liberia's EPI-SBC system can benefit from adopting adaptive learning mechanisms consistent with CAS theory. This involves leveraging existing informal networks, such as faith-based leaders, market associations, and local radio operators, as iterative learning agents that adjust communication strategies in response to community feedback.

Human resources and capacity development

SBC effectiveness depends on the frontline workforce capacity and motivation. The review found that CHAs and gCHVs, who form the backbone of community engagement, lack consistent training, supervision, and job aids for effective interpersonal communication. Building their capacity in behavioural insight generation, participatory communication, and rumour management would transform them into active behaviour change facilitators rather than information transmitters.

This requires developing a national SBC training package for health workers, embedded into pre-service and in-service curricula. Cross-sector collaboration with the Ministry of Education and communication schools could enhance the professionalisation of SBC competencies. Additionally, introducing performance-based incentives linked to community engagement outcomes may strengthen motivation and retention among community actors.

Strategic implications for the EPI-SBC roadmap

The synthesis points to several actionable implications for policy and practice:

1. Institutionalise SBC governance by formalising coordination structures and clarifying roles between HPD and EPI.
2. Integrate behavioural data into the national EPI monitoring system to enable evidence-driven decision-making.
3. Establish sustainable domestic financing for SBC activities within the national health budget.
4. Invest in workforce capacity, ensuring that CHAs, gCHVs, and health workers are equipped with SBC and interpersonal communication skills.
5. Leverage community structures, religious leaders, women's groups, and traditional authorities as trusted intermediaries for vaccine promotion.
6. Develop continuous, multi-platform communication channels, including community radio, mobile messaging, and local dialogue forums, to counter misinformation.
7. Adopt a gender-transformative lens, promoting shared decision-making and equitable caregiver participation.

Toward a systemic SBC framework

The overall implication of this review is that behavioural and system determinants of immunisation are inseparable. Addressing demand barriers requires not only improved communication but also structural reform in how SBC is conceptualised, financed, and operationalised. Liberia's next-generation EPI-SBC strategy must therefore evolve into a systemic framework that connects behavioural

insights with service delivery realities, strengthens community feedback systems, and embeds social listening into governance processes.

By institutionalising SBC as a cross-cutting pillar of the health system, rather than an auxiliary activity, Liberia can achieve sustained improvements in vaccine demand, equity, and trust. Such an approach aligns with global calls for resilient, locally owned health systems capable of maintaining high immunisation coverage even amid social or epidemiological disruptions.

Limitations of this review

Our search strategy had several limitations, including reliance on only English-language databases, which may have introduced a language bias. Some of the studies included in this review were retrospective, which may have affected some of the findings. The inclusion of cross-sectional studies also made it not possible to determine causality. Despite these challenges, this review provides a comprehensive overview of SBC in immunisation for Liberia and SSA. Focusing on just four countries for research question 3 means we may have missed important regional nuances and challenges.

Conclusions

Over the past decade, Liberia's Expanded Programme on Immunisation (EPI) has made notable progress. However, persistent behavioural, social, and systemic challenges continue to impede equitable vaccine uptake across counties. This critical desk review highlights that, while structural barriers remain significant, the behavioural determinants influencing vaccine demand warrant equal policy and programmatic attention, particularly regarding social behavioural change factors.

It is recommended that Liberia undertake further research into the socio-economic obstacles affecting routine vaccination and examine nationwide routine immunisation coverage. The Ministry of Health should also ensure that sufficient resources are allocated to the designated Immunisation Social and Behavioural Change (SBC) focal point to enable ongoing monitoring and refinement of relevant activities and programmes.

Weak community engagement structures, limited utilisation of behavioural evidence, and fragmented coordination between the Health Promotion Division (HPD), EPI, and partners have hindered the establishment of a cohesive SBC system. Overcoming these barriers requires a shift from campaign-oriented communication to approaches that are institutionalised, evidence-informed, and integrated within health systems. Embedding SBC within national and county health structures will facilitate the continuous generation, interpretation, and application of behavioural insights to inform interventions. Strengthening governance, enhancing data use for behavioural monitoring, and investing in workforce capacity are vital steps to transform SBC from sporadic activities into a central function of Liberia's immunisation system.

Ultimately, achieving universal immunisation coverage in Liberia will depend on building and maintaining public trust in vaccines, promoting community ownership, and incorporating behavioural science throughout all aspects of health system design and implementation. A national SBC roadmap that is firmly rooted in context, focused on equity, and institutionally supported will not only advance EPI objectives but also foster resilient, people-centred health systems. Continued investment in Immunisation SBC is crucial, particularly as social media increasingly shapes how information and misinformation is shared among individuals and communities in Liberia.

Finally, securing funding for initiatives outside public health emergencies is becoming increasingly difficult. Ministries of health across the continent must give greater priority to allocating resources for immunisation SBC programmes and work towards making their activities less reliant on donor funding, thereby promoting long-term sustainability.

What is already known about this topic

- Over the past decade, Liberia's Expanded Programme on Immunisation (EPI) has made notable progress.
- In Liberia, many infants are still missing their first basic vaccines
- Persistent behavioural, social, and systemic challenges continue to impede equitable vaccine uptake across counties.
- Community Health workers have a key role in supporting immunisation programmes

What This Study Adds

- Weak community engagement structures, limited utilisation of behavioural evidence
- There is a need to have a Liberian SBC roadmap, focused on equity and people-centred health systems
- Continued investment in Immunisation SBC is crucial, particularly as social media increasingly shapes how information is shared in Liberia.
- As donor funding continues to decline, there is a need for the Liberian MOH to give greater priority to allocating resources to immunisation SBC programmes and to work towards making its activities less reliant on donors.

Conflict of Interest

The authors of this work declare no competing interests.

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Authors' contributions

FUS, CK, JACN were responsible for the conceptualization and design of the study. FUS and SJA participated in data collection and analysis. FUS, CK and JACN drafted the manuscript. GRI, CK, GA, EK critically reviewed and equally contributed to the content of the manuscript. All authors read and approved the final manuscript.

Abbreviations BDM: Behavioural Drivers Model
CAS: Complex Adaptive Systems
CHA: Community Health Assistant
CHAs: Community Health Assistants (plural)
CHSS: Community Health Services Supervisor
COM-B: Capability, Opportunity and Motivation (COM-B) model
COVID-19: Coronavirus Disease 2019
CSO: Civil Society Organisation
EPI: Expanded Programme on Immunisation
EPR: Emergency Preparedness and Response
FGD: Focus Group Discussion
gCHV: General Community Health Volunteer
IDI: In-Depth Interview
M&E: Monitoring and Evaluation
MoH: Ministry of Health
NGO: Non-Governmental Organisation
SEM: Socio-Ecological Model
UNICEF: United Nations Children's Fund
WHO: World Health Organisation

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